EFFECTS OF GOVERNMENT EXPENDITURE ON SECTORAL GROWTH IN KENYA

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K102/PT/CTY/13632/2009

A Research Project Submitted to the School of Economics in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Economics of Kenyatta University

October, 2013

Declaration

This research project is my original work and has not been presented for the award of a degree in any other University or any other academic award.

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This Research Project has been submitted to the School of Economics, Kenyatta University, with my approval as the University supervisor.

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Dedication

I would like to dedicate this research to my loving parents George Nyagwachi and Josephine M. Nyagwachi.

Acknowledgements

I would like to thank the Almighty God and express sincere gratitude to my supervisor Dr. Kosimbei for his constructive recommendations, suggestions, criticisms and advice which was invaluable in shaping this research project.

Special gratitude goes to my parents George Nyagwachi and Josephine Nyagwachi, my brothers, and extended family for their sacrifices, unending support, love and encouragement which has gotten me this far.

I would also like to acknowledge the contribution of my friends and classmates Kibet Lagat, Caroline Dzame, Jacob Nato and Lydia Njeri for their encouragement and support throughout the entire course. I am also grateful to the library staff at the Kenya National Bureau of Statistics and Kenyatta University for their assistance. However, I am entirely responsible for any shortfalls in this paper.

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Abbreviations and Acronyms

ADL: Autoregressive Distributive Lag

CES: Constant Elasticity of Substitution

GDP: Gross Domestic Product

IMF: International Monetary Fund

KNBS: Kenya National Bureau of Statistics

Ksh. Kenya Shillings

MTEF: Medium Term Expenditure Framework

OECD: Organization for Economic Co-operation and Development

OLS: Ordinary Least Square Method

PFM: Public Financial Management

VAR: Vector Autoregression Model

Abstract

The rapid growth of both sectoral government recurrent and development expenditure in Kenya as well as the slow growth of wage employment levels has raised concerns among policy makers on the effects of these growth levels on sectoral economic growth. The agriculture and forestry sector is one of the most important sectors for the Kenyan economy contributing 24% of national GDP in 2011. M'amanja and Morrissey (2005) found that human capital development which is achieved through investment in the education and health sectors was the most important determinant of overall GDP growth in Kenya. According to Barro (1990) the public administration and defense sector plays a critical role in encouraging private sector investment, savings and economic growth through enhanced property rights. Although the whole economy has experienced positive growth in most years since 1972, the above sectors have all experienced negative growth in some years between 1972 and 2011. The specific objectives of this study were to determine the effects of sectoral government development and recurrent expenditures as well as public and non-public wage employment on the economic growth of the above four sectors. The study used Panel Least Squares method for the period 1972-2011 and found that development expenditure, public sector and non-public sector wage employment have a positive effect on sectoral growth while recurrent expenditure had a negative effect on sectoral growth. Therefore, the government needs to reduce wasteful recurrent expenditure in the above four sectors and increase expenditure on priority development projects as well as pursue employment creation policies to ensure sustained growth in these four important sectors.

CHAPTER ONE: INTRODUCTION

1.1 Background

There have been debates on the need for government in society since ancient times, as far back as the 17th century philosophers like John Locke and Thomas Hobbes articulated the need for government in society, even though these philosophers disagreed on the type of government and how government should be formed they concurred that government was necessary to provide security and prevent social disintegration. The public sector is still essential in the modern economy, some of the key goals of government in the modern economy are to promote economic growth, create employment, ensure efficiency in allocation of resources and stabilization of the economy. In Kenya, the public sector plays a key role in the delivery of services such as health, education, defence and social security (Njuguna, 2009).

According to Ram (1986), studies on the impact of government size on economic growth and performance are important because of the opposing views on the role and size of government required to promote economic growth. Proponents of large government point out that the role played by government in harmonizing conflicts between private and social interests, prevention of exploitation of the country by foreigners, securing an increase in productive investment and providing a socially optimal direction for growth and development makes large government an engine for economic development. The opposing point of view suggests that because government operations are conducted inefficiently, the regulatory process imposes excessive burdens and costs on the economic system. Furthermore, most governments' fiscal and monetary policies tend to distort economic incentives and lower the productivity of the system as a result large governments are detrimental to economic growth.

The global financial crisis that led to a global recession in 2008, and the sovereign debt crisis among some European Union member states that emerged in late 2009 and early 2010 brought back to the fore front the argument of whether the government has a role to play in averting such occurrences, determining the performance of the economy and leading them back to prosperity and sustained growth. There is still disagreement among economists and policymakers on the effects of various measures both fiscal and non-fiscal taken by the American and European governments to tackle the global financial crises. However, it is evident that in some cases similar measures had different impacts in different countries, further in some cases like the United States, government intervention in specific sectors such as the auto industry and the financial sector led to varied results (Aizenman and Jinjarak, 2011; Zandi' 2009; Spilimbergo et al 2008).

Between 2004 and 2007 government expenditure as a share of GDP varied significantly across OECD countries, South Korea had the lowest average total expenditure to GDP ratio of 27.3 % whereas Sweden had the largest average of 54.4 %. At a sectoral level, Germany spent 47% of its public spending on social protection while Canada spent only 24 % the United States was the largest spender on defence which took up 12 % of its government spending. Using deficit spending to make investments that lead to long-term growth may not be optimal for generating economic stimulus, but it helps boost the economy in the short term and pays off in the long run (Dewan and Ettlinger, 2009). The average GDP growth for the world between 2003 and 2013 was 3.8% with negative growth of -0.6% in 2009. Among the 27 European Union members GDP growth rate has been below 4% between 2002 and 2012 with negative growth of -4.3% and -0.3% in 2009 and 2012.

The different effects of government expenditure in different countries and sectors as well as the desire by policy makers in individual countries to put into place relevant measures and policies to influence economic growth and employment creation has made it necessary to have more country-specific and sector-specific studies. Policy makers should not just focus on economic growth as a measure of the impact of their policies but they should also analyze the impact of their policies on other key economic indicators such as employment creation which directly reduces poverty, especially in developing countries (Stiglitz 2002; Perkins 2005).

According to the International Monetary Fund (2012) unemployment which is one of the key measures of economic performance has increased substantially both in emerging and developed economies since the global financial crisis. The IMF prescribed different policy measures including government expenditure that would boost employment in emerging and developed economies. The IMF pointed out that fiscal policies and other policies such as effective active labour market programmes, developing individual savings accounts and addressing distortions from high labour tax wages could be used to promote employment in developing countries. In addition, the IMF recognized the need for country-specific approaches in fiscal policy formulation to tackle unemployment. Even though there is a need for sectoral intervention and other relevant strategies to tackle high unemployment it should be noted that a purely sectoral approach may limit the extent of employment creation (Heintz, 2006).

There are two main opposing theories on the effect of government expenditure, the monetarist theory tends to trust free markets and believes that government spending causes large deficits, unnecessary social programmes and inefficient, bloated bureaucracies. On the other hand, the Keynesian theory advocates for government expenditure as a means of increasing aggregate demand and promoting economic growth.

Kenya's Vision 2030 is the economic blue print published in 2007 that seeks to transform Kenya into a newly industrialized country by the year 2030. According to Vision 2030, a double-digit GDP growth rate and employment creation are vital for Kenya to become a middle-income country. For Kenya to achieve the goals of Vision 2030 key sectors under the vision such as agriculture, health, education and public administration and defence among others need to grow and create new jobs.

In Kenya, the budget-making process is informed by the MTEF manual prepared by the National Treasury in March 2011 and the Public Financial Management (PFM) Act 2012. Kenya's annual budget estimate books classify government expenditure as either recurrent expenditure or development expenditure.

According to Njeru (2003), recurrent expenditure contains primarily the expenditures by the ministries covering day-to-day normal services by the ministry, wages and salaries (labour costs) and operation and maintenance along with minor capital expenditures such as the purchase of equipment. Recurrent expenditure contributes to economic growth since there is an increased demand for goods by public servants whose wages are a big fraction of the government's recurrent expenditure, the increased demand by public servants stimulates increased production in all the major sectors of the economy. However, due to inefficiencies in public sector operations, recurrent expenditure may also be detrimental to economic growth. Development expenditure comprises the total expenditures from all the development projects and activities carried out by government ministries. Development expenditure is more directly linked to growth and employment since investment by the public sector in key infrastructure such as roads, railways, energy and technology stimulates investment by the private sector in the production of goods and services that rely on the provided infrastructure.

The contribution of the agriculture and forestry sector to the national GDP in Kenya has been consistently high since independence, over the last few years, the contribution of agriculture and forestry to the national GDP has risen from 21.7% in 2007 to 24% in 2011. According to Barro (1990), expenditure on public education is an investment in human capital, M'manja and Morrissey (2005) found that human capital development was one of the most important determinants of long-run GDP growth in Kenya hence expenditure by the government on quality education and healthcare provision was critical for improved productivity and economic growth.

According to Barro (1990), enhanced property rights are similar to a reduction in the marginal tax rate which increases the growth and savings rate in an economy. Barro therefore pointed out that government expenditures on maintenance of law and order, national security and some regulatory activities help sustain property rights for investors which promotes savings and growth.

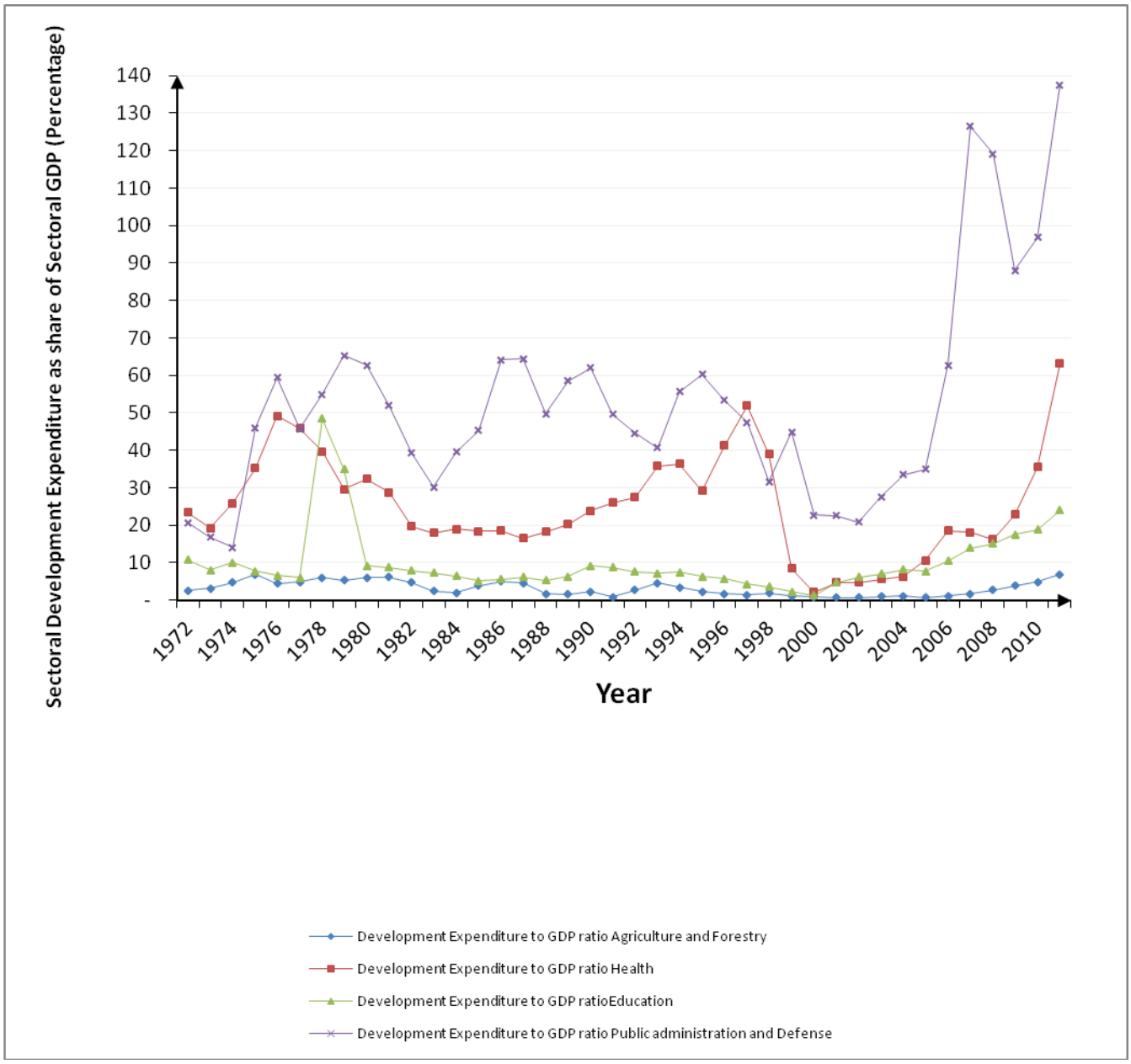

Figure 1.1 Kenya Sectoral Government Development Expenditure (as a share of sector GDP)

Source of data: *KNBS statistical abstracts*

Government development expenditure has increased and decreased from year to year with some sectors such as agriculture and forestry having low development expenditure around

election years like in 1991, 1997 and 2002. Development expenditure in the four sectors has grown significantly since 1988 with the public administration and defence experiencing relatively higher growth in development expenditure since 2002. Total development expenditure has risen from Ksh. 440 million in 1968 to Ksh. 296.8 billion in 2011; total development expenditure to GDP ratio has remained below 0.25 between 1972 and 2011 however at sectoral level the ratio has been significantly higher for public administration and defence sector and the health sector.

Development expenditure which targets programmes and projects that are supposed to stimulate growth and creation of employment in the respective sectors rose from year to year in most of the years between 1972 and 2011. In the years when development expenditure in a sector declined the decline in expenditure was not relatively large.

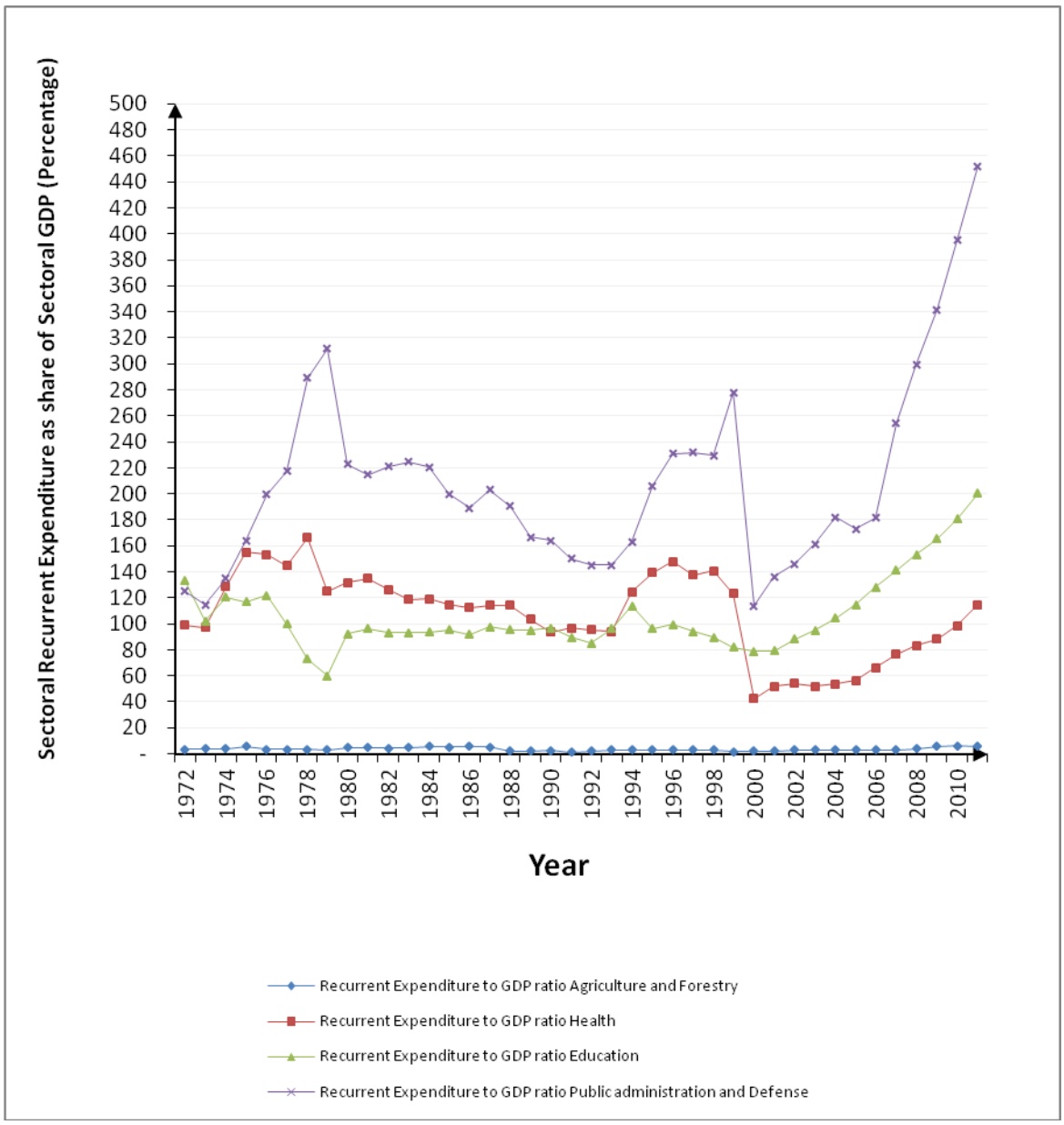

Figure 1.2 Kenya Sectoral Government Recurrent Expenditure (as a share of sector GDP)

Source of data: *KNBS statistical abstracts*

Total recurrent expenditure grew from Ksh.1.55 billion in 1968 to Ksh. 747 billion in 2011. Recurrent expenditure on the four sectors has gradually risen with recurrent expenditure on public administration and defence being the highest of the four sectors in most years except for some years like 1973-1976, 1985-1987, 1991-1994, 1998-1999, 2005 and 2006 where recurrent

expenditure on education was the highest of the four sectors. There has been a relatively higher growth rate of recurrent expenditure on education and public administration since 2002.

The recurrent expenditure to GDP ratio has consistently been very high between 1972 and 2011 whereas the ratio has been very low in the agriculture sector where the recurrent expenditure to GDP ratio has been below 6%. It is evident that recurrent expenditure in all of the sectors has steadily risen in most of the years since 1972, especially in the public administration and education sectors. Recurrent and development expenditure are used as a policy tool by the government to achieve different objectives but some of the key objectives in a developing country like Kenya is to ensure that there is sustained growth and job creation in all the key sectors.

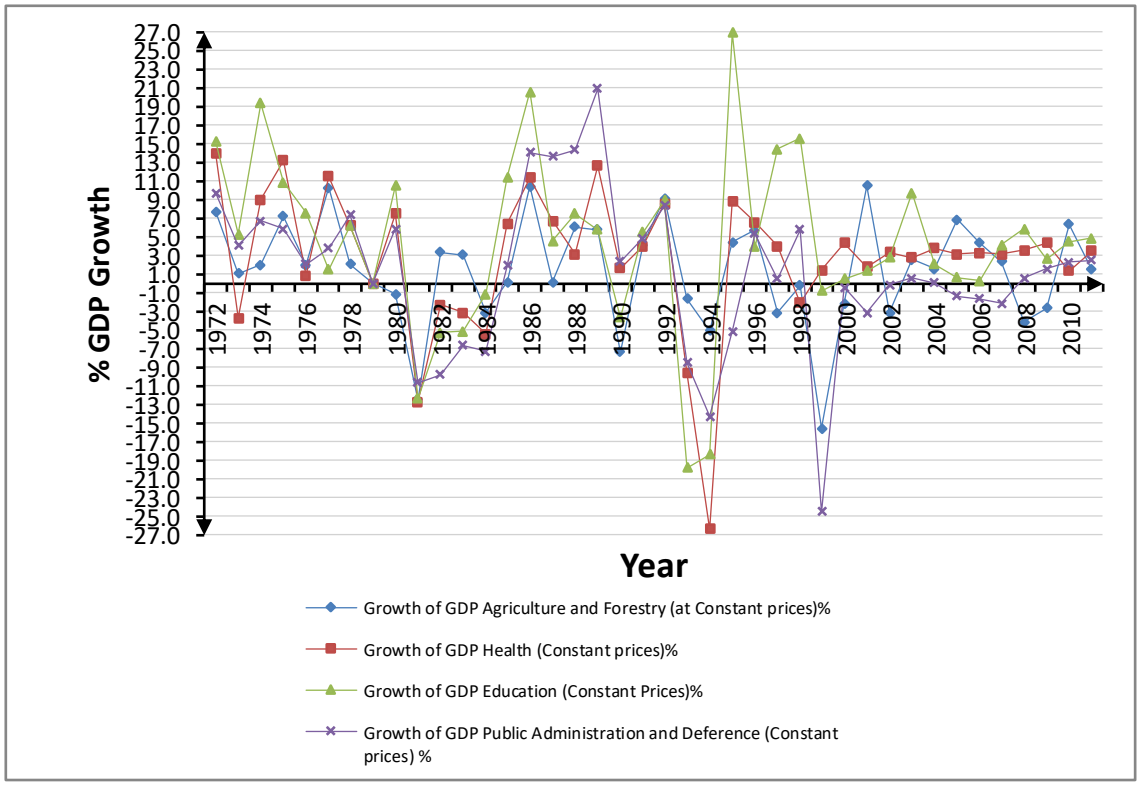

Figure 1.3 Kenya Sectoral GDP Growth (%) at constant prices

Source of data: *KNBS economic surveys*

Over the study period, the economy has experienced high GDP growths of 6.9% in 1972 8.6% in 1977 6% in 1981 and 7.0% in 2007 low growth rates of 0.2% were experienced in 1993 and 2000. Between 1972 and 2011 sector real GDP growth fluctuated between growth rates of 26.92% and contractions of 26.4%. The education sector had high growth rates of 19.4%, 20.6%, 26.92%, 15.55% and 9.7% in 1974, 1986, 1995, 1998 and 2003 in recent years high growth in this sector has been experienced after an election year that is in 1998, 2003 and 2008.

Since 1997 growth of real GDP in the health sector has been below 4% whereas the public administration and defence sector experienced high growth in the late 80s and early 90s with the highest growth being 20.95% in 1989 however, since 1993 most of the years have had either negative or low growth. The Agriculture and forestry sector has had growth of less than 7% since 2002 with negative growth in 2002, 2008 and 2009.

The Kenyan economy has not achieved a steady growth rate during the study period; at a sectoral level, the growth rate has been more irregular with all the sectors experiencing negative growth rates in some of the years between 1972 and 2011.

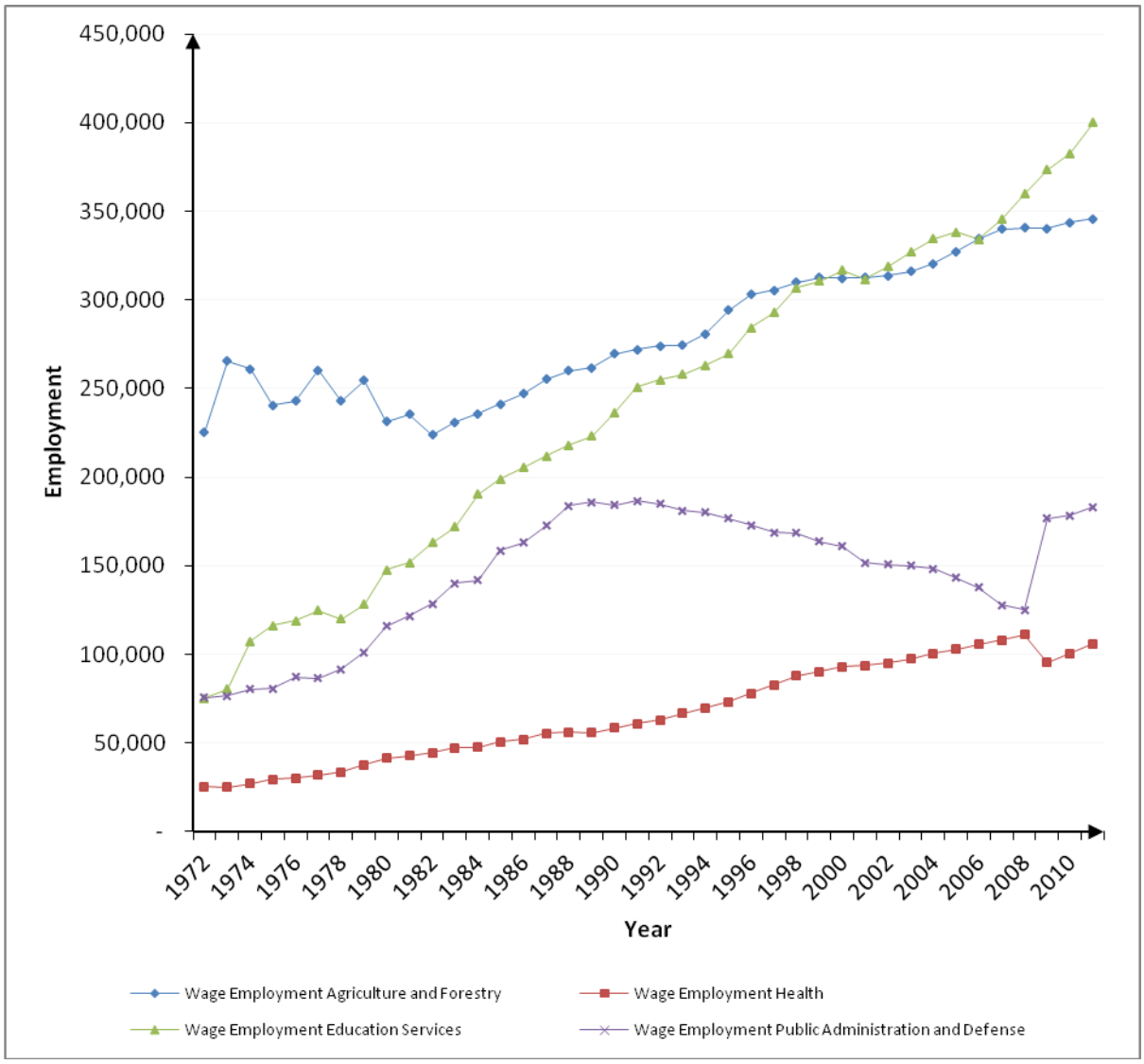

Figure 1.4 Sectoral Wage Employment in Kenya

Source of data: *KNBS statistical abstracts*

Of the four sectors wage employment was highest in the agriculture and forestry sectors between 1972 and 1998, from 1998 to 2011 wage employment in education services was higher than in the other three sectors. Wage employment in agriculture and forestry generally decreased

between 1973 and 1982 from 256,365 to 223,867 but since 1982 it has generally risen and it was 345,878 in 2011.

Wage employment in the education sector has continuously risen from 75,695 in 1972 to 399,999 in 2011; this is in line with the school enrolment rate which grew significantly over the study period. Wage employment in the health sector has consistently been relatively lower than the other three sectors over the study period; employment in the health sector has also increased but at a relatively slower rate from 25,359 in 1972 to 111,013 people in 2008.

Wage employment in the public administration and defence sector which mostly covers public servants increased from 75,695 in 1972 to 185,796 in 1989, throughout the 1990s and the noughties the wage employment in this sector decreased significantly to a low of 125,155 in 2008 this is partly attributed to restructuring during the 1990s that was mandated by IMF and World Bank. Wage employment in all the key sectors has grown but at a relatively slow rate between 1972 to 2011 given that the population of Kenya more than doubled between 1979 and 2011 as it rose from 15,327,000 to 39,500,000.

In Kenya the budget-making process is informed by the Constitution of Kenya 2010, the MTEF manual prepared by the National Treasury in March 2011 and the Public Financial Management (PFM) Act 2012. In the budget-making process, the Sector Working Groups play a critical role in the review of ongoing programmes and setting of target indicative budget requirements as well as ensuring public participation through sector hearings. With the Sector Working Groups playing a critical role in the budgeting process and the classification of Vision 2030 flagship projects according to foundation, pillars and sectors under vision 2030, policy makers require more sector-specific studies to inform their policy choices which are increasingly being made at sector level.

Most of the published studies on the impact of government expenditure and other fiscal policies in Kenya such as Menjo and Kotut (2012), M'Amanja and Morrissey (2005), Were (2001) and Devarajan et al (1996) either analyze the effect of fiscal policies on the entire economy or undertake a cross country analyses.

1.2 Problem Statement

The MTEF manual prepared by the National Treasury in March 2011 and the PFM Act 2012 mandate Sector Working Groups to play a critical role in the review of ongoing programmes and setting of target indicative budget requirements as well as ensuring public participation through sector hearings. Strategies on the implementation of Vision 2030 such as the key flagship projects and interventions are classified according to the pillars and sectors of Vision 2030. However, although key fiscal policy decisions, implementation of the policies and reviews are done at a sectoral level most of the published studies that have been done on government expenditure and other fiscal variables in Kenya, for example, Menjo and Kotut (2012), M'Amanja and Morrissey (2005), Were (2001) and Devarajan et al (1996) among others either analyze the entire economy or carry out cross country analyses.

Development and recurrent expenditure by the government on all the key sectors have grown significantly over the years. Total recurrent expenditure has risen from Ksh.2.68 billion in 1972 to Ksh. 747 billion in 2011while total development expenditure has risen from Ksh.1.13 billion in 1972 to Ksh. 296 billion in 2011, the ratio of development and recurrent expenditure to sector GDP has also increased in most years between 1972 and 2011. However, over the same period, the GDP growth rate of each of the sectors has not been consistent with all the sectors experiencing negative growth in some of the years. Both private and public wage employment in

agriculture and forestry, education and health has grown from 225,068, 75,221 and 25,359 in 1972 to 345,878, 399,999 and 106,086 respectively in 2011. The growth in wage employment has been relatively low since the total population of Kenya more than doubled between 1979 and 2011, it rose from 15,327,000 to 39,500,000, the labour force also doubled rising from 8,997,557 in 1990 to 16,099,382 in 2011.

1.3 Research questions

This research paper seeks to address the following questions:

i. What are the effects of government development expenditure on sectoral growth in Kenya?
ii. What are the effects of government recurrent expenditure on sectoral growth in Kenya?
iii. What are the effects of public sector wage employment on sectoral growth in Kenya?
iv. What are the effects of private sector wage employment on sectoral growth in Kenya?

1.4 Objectives of the study

1.4.1 General Objective

The general objective of this study is to determine the effects of government expenditure and wage employment in agriculture and forestry, health, education and public administration and defence on growth in the sectors.

1.4.2 Specific Objectives

i. Determine the effects of government development expenditure on sectoral growth in Kenya.
ii. Determine the effects of government recurrent expenditure on sectoral growth in Kenya.
iii. Determine the effects of public sector wage employment on sectoral growth in Kenya.

iv. Determine the effects of non-public sector wage employment on sectoral growth in Kenya.

1.5 Significance of the study

This paper will provide insight and guidance to policy makers in Kenya at the National, county and sectoral levels on the effects of government expenditure and wage employment in the agriculture and forestry, health, education and public administration and defence sectors on the performance of these sectors, this study will also help policy makers in decision making especially when it comes to allocation of scarce budgetary resources in above sectors.

1.6 Scope of the study

This study will focus on the effects of government expenditure both recurrent and development in agriculture and forestry, health, education and public administration and defence sectors on the economic growth of the sectors, as well as the effects of public and non-public wage employment on the growth of the above sectors. The study period is 1972 to 2011 using annual data.

One of the major limitations that the study will face is the publication of government expenditure data according to the government financial year whereas all the other variables are published using the calendar year. This limitation will be overcome by converting the government expenditure data from financial year to calendar year.

CHAPTER TWO: LITERATURE REVIEW

2.1 Theoretical Literature

2.1.1 Musgrave – Rostow's Theory

Both Musgrave and Rostow suggested that there was a relationship between government expenditure and economic growth and development in a society, the theory states that public expenditure is crucial for economic development but the amount and manner of expenditure depends on the country's stage of development. The three major stages of development are the early development stage, rapid growth phase and the mass consumption stage.

In the early development stage of economic development private savings are not adequate to finance social overhead capital. The public sector investment in an economy at this stage of development is relatively high since it is needed to provide infrastructure and put in place important social systems as well as key investments in human capital.

As the economy moves to the rapid growth phase public investment is still required to complement private investment and deal with market failure but public investment is relatively less when compared to earlier development stages. In the mass consumption stage public sector interventions are mainly for income redistribution and welfare (Brown et al 1996).

2.1.2 Endogenous growth model

Barro (1990) is a modern take on then Keynesian theory and model of growth, Barro premises his work on an assumption of constant returns to a broad concept of capital that covers human and non-human capital, this analysis focuses on the size of government and its impact on the rates of growth and savings. In his analysis, Barro classifies government expenditure as either productive or non-productive.

Productive government expenditure refers to the activities that enter directly into the production function and expenditures on property rights enhancement. According to the analysis, non-productive government expenditure lowers the growth and savings rate while productive government expenditure has a positive effect on growth and savings. One of the growth equations in Barro's model is;

$$\gamma = \frac{\dot{c}}{c} = \frac{1}{\sigma} \cdot [(1 - \tau) \cdot \varphi (g/k) \cdot (1 - \eta) - \rho] \quad \text{2.1}$$

Where;

γ is the per capita growth rate

c is consumption per person

g is the quantity of public services provided to each household producer

k is capital per worker

τ is the tax rate.

From equation ***2.1*** an increase in the tax rate reduces the growth rate but an increase in government public services provided as a fraction of output per person increases the change in output due to a change in capital per worker which raises the growth rate. A decrease in the marginal tax rate τ for a given g/y increases the growth rate, for investors enhanced property rights is similar to a reduction in the marginal tax rate.

The increase in growth rate dominates when the government is small. Barro concludes that productive government expenditure that is financed by non-distortionary taxes will enhance growth.

2.1.3 Keynesian theory

Keynesian theory by John Maynard Keynes sought to provide a solution to what economists believed to be the failure of laissez-faire economic liberalism; he promoted a mixed economy where both the private sector and the state play an important role. The Keynesian theory advocates for an increase in aggregate demand during downturns as a means of ensuring the economy recovers and grows. Aggregate demand can be increased by expanding government expenditure; an increase in government expenditure also has a positive impact on employment creation both in the public sector and private firms (Keynes, 2002)

2.1.4 Wagner's organic state theory

According to this theory, the ratio of government expenditure to GDP increases as per capita incomes in an economy increase. At higher per capita incomes the government spends more on welfare, redistribution, keeping monopolies in check and there is also an increased demand for services such as law and order. As the per capita income increases the government also spends more on education, health and recreational services which are explained by income elasticity of demand as a result the theory notes that states grow like organisms to match the changes in society.

2.1.5 Peacock and Wiseman political constraint model

The government always wants to spend more but they are constrained since citizens want to pay less tax. There is a level of taxes that citizens can tolerate however, as incomes increase citizens are willing to pay more taxes and the government can spend more. During crises, citizens are also willing to pay higher taxes and the government is forced to increase taxes since incomes are not growing, but after each crisis, governments don't go back to their pre-crisis expenditure thus growth in public spending is characterised by spurts during crisis that are not

reversed even after the crisis dissipates. The model also noted that crises also lead to the concentration of power in the central government which is not reversed post crises.

2.1.6 Crowding out theory

Government expenditure leads to crowding out of the private sector, this occurs in two ways direct and indirect crowding out. Direct crowding out occurs when the government uses the same factor inputs as the private sector, competition for the same factors of production leads to decreased production by the private sector. When the public sector takes up production that was done by the private sector there is a decrease in GDP attributed to public sector inefficiencies.

Indirect crowding out occurs when the private sector production and investment are discouraged by higher taxes and borrowing by the government as it seeks resources to increase production. Borrowing by the government leads to an increase in interest rates in the market and thus affordable credit is not available for the private sector while increased taxation increases operating costs for the private sector thus reducing their profit and incentive to participate in production (Bailey, 2002).

2.1.7 Monetarist Theory

This was a theoretical challenge to Keynesian economics and is essentially an extension of classical economic theory. Much of the monetarist theory was developed by Milton Friedman, monetarists stress the importance of money supply in determining nominal GDP and price levels in an economy. Monetarists tended to trust free markets and believed that automatic stabilizers were sufficient to stabilize the economy. They believed that monetary policy did a better job than fiscal policy because excessive government spending only interfered with the workings of free markets, caused large deficits, unnecessary social programmes and inefficient, bloated bureaucracies (Gordon, 1974).

2.2 Empirical literature

Ram (1986) carried out a cross-sectional study covering the period 1960 to 1980 on the impact of government size on economic growth for 115 least developed and developed countries. The study assumed an economy with two broad sectors the government (G) and nongovernmental (C) sectors which both depend on inputs of labour and capital denoted by L and K respectively, he derived and estimated the following equation.

$\dot{Y} = \alpha_K (I/Y) + \beta_L \dot{L} + \gamma (G/Y)$……..2.2

Where;

$\dot{Y}$ is economic growth.

(I /Y) is investment to GDP.

$\dot{L}$ is growth in the labour force.

G/Y is government consumption to GDP.

Ram found that the size of the government had a positive effect on economic performance and growth, there was also a positive externality effect of the size of the government on the rest of the economy and the relative factor productivity was higher in the government sector than in the rest of the economy in the 1960s however the relative factor productivity of the government sector declined over the study period.

Devarajan et al. (1996) separated government expenditure into productive and unproductive expenditure by how a shift in the mix between the two alters the economy's long-term growth rate with an increase in productive expenditure leading to a steady-state growth rate of the economy, this not only depends on productivity but also on the initial share of the expenditure. The study used panel data and the ordinary least square method (OLS) to estimate the link between components of government expenditure and economic growth focusing on 43

developing countries over the period 1970 to 1990. In their estimation equation, a five-year forward-moving average of per capita real GDP growth is used to reflect the fact that public expenditures usually take time before their effects on growth can be registered.

According to the study by Devarajan et al. (1996) per capita real GDP growth for each country was determined by the share of total government expenditure in GDP, a vector of public expenditure ratios (various expenditure shares by functional classification), a shock variable that was the weighted average of real interest rate, export price index and import price index as ratios to GDP of debt, exports and imports respectively and the premium in black market for foreign exchange. They also included continental dummy variables. The study found that productive government expenditures had a negative or insignificant effect on economic growth while current expenditures had a positive effect on growth, they explained their results by stating that productive expenditures could be unproductive if they are in excess and in particular since their study focused on developing countries they stated that such countries may have excessive capital expenditures which makes them unproductive at the margin.

Glomm and Ravikumar (1997) carried out a review of developments on productive expenditure and long-run growth; the expenditures considered by the study are those that enter as inputs in the production function such as infrastructure and those that enhance investment technologies such as expenditure on education. They employ a version of the Diamond (1965) model on capital accumulation but in their model instead of the economy converging to a steady state level it converges to a steady growth path. The overlapping generation model where public expenditure on education affects capital accumulation is also considered in their study. After reviewing a variety of studies they found that the studies that concluded that public capital had an insignificant effect on output mostly concentrated on short-run effects, in conclusion, they

also noted that apart from the two categories of expenditures they considered other types of public investment such as expenditure on public health could have an impact on long-run growth.

Kneller et al. (1999) set out to determine whether the structure of taxation and public expenditure had an effect on steady-state growth, this study was different from others like Deverajan (1996) because it went beyond the structure of government expenditure to also consider the taxation structure; taxes were classified as either distortionary or non-distortionary. Distortionary taxes are defined as those taxes that affect the investment decisions of agents with respect to physical and human capital, while the definition of productive government expenditure is defined as expenditure that is included in arguments in the private production function.

The study covered 22 OECD countries in the period 1970-1995; in their data, they take five-year averages to remove business cycle effects. The analysis using panel data and the OLS method found that an increase in productive expenditure financed by a mix of non-distortionary taxes enhanced growth while an increase in distortionary taxation reduced growth. They also determined that mis-specification of the regression equation leads to different conclusions and this could explain the divergent results arrived at by different studies.

Fatás and Milhov (2001) set out to determine the effects of variation in government spending on key macroeconomic variables specifically consumption and employment, further, they sought to compare their findings to the prediction of the real business cycle model. They used the vector autoregression framework for their empirical analysis and found that an increase in spending leads to a rise in private output with residential investment and consumption being the driving factor and also expansionary fiscal policy was associated with an increase in

manufacturing wages and private employment. The study focused on the United States of America and used general macroeconomic variables from 1960 to 1996.

Were (2001) used OLS and time series data from 1975-1995 to determine the implication of Kenya's external debt on economic growth. This study found that debt can affect economic growth directly through its effect on productivity of investment. Private investment as a ratio of GDP, investment in human capital and current public investment were found to have a positive influence on growth but past public investment had a negative effect on growth. External debt accumulation was found to have a negative impact on economic growth and private investment. The study also found that debt servicing did not affect growth adversely but had some crowding-out effect on private investment.

Nijkamp and poot (2002) carried out a meta-analysis of the impact of fiscal policy on long-run growth, the study was carried out on 23 published papers yielding 123 distinct observations, the journals cover the period between 1983 and 1998 with 88.6% of the studies analyzed found to have used regression models. By use of descriptive statistics, contingency table analysis and rough set analysis they found that the positive impact of conventional fiscal policy such as general government consumption, tax rates and defence on growth was weak but the importance of expenditure on education and infrastructure on growth was confirmed. They also found that articles in highly ranked journals were less likely to proclaim the importance of fiscal policy in determining growth than those in lesser ranked journals, it is worth noting that their sample of published papers was not randomly selected.

M'Amanja and Morrissey (2005) set out to determine the impact of fiscal policy and other related variables on growth in Kenya. The study used time series techniques on annual time series data for the period 1964-2002. They classified government expenditure as productive and

unproductive and defined the two expenditures in the same way as Barro (1990). Expenditures on health, education and economic services were treated as productive expenditures by M'Amanja and Morrissey (2005). The dependent variable was real per capita GDP and the explanatory variables included productive government expenditure, development expenditure, direct (income) tax revenue, grants received from abroad, private investment and log of primary and secondary school enrolment as a proxy for human capital.

This study also included non-fiscal variables such as private investment, school enrolment, and foreign aid inform of grants. The study had a small sample as a result the authors used the autoregressive distributive lag (ADL). They found that unproductive expenditure and non-distortionary tax were neutral to growth and productive expenditure had an adverse effect on growth. They also showed that by removing the neutral components the accuracy of parameter estimates of the remaining variables was improved. It is evident from this study that the results showing that productive expenditure has an adverse effect on growth is contrary to the existing theory but the authors pointed out that in future studies only expenditures that are truly productive such as quality of teaching and preventive health care should be included in education and health expenditures respectively.

School enrolment was found to be one of the most important determinants of long-run growth in Kenya; other variables such as government investment, distortionary tax and non-tax revenue, and private investment were also found to have a positive impact on growth. Foreign aid contrary to their hypothesis was found to have a negative effect on per capita output.

Menjo and Kotut (2012) set out to determine the effects of fiscal policy on private investment and economic growth in Kenya using time series data for the period 1973 to 2009. The study used the two-stage instrumental variable estimation method for regression analysis.

Two estimation equations were used one corresponding to investment and the other to growth; the equations in the study were specified in linear form. They postulated that investment in Kenya was determined by past investment, foreign capital inflow, budget deficits, real interest rate, government consumption expenditure, tax burden and public debt among other factors whereas growth was dependent on the growth of exports, investment/GDP ratio, exchange rate, debt service and growth in terms of trade.

They found that the previous year's investment and government consumption had a positive effect on investment. They also determined that investment was the most important determinant of growth in Kenya in conclusion there results found that fiscal policy had an impact on investment and in turn investment played a major role in determining economic growth in Kenya.

2.3 Overview of Literature

The empirical literature is inconclusive since different studies arrived at contrary conclusions on the effects of government spending on growth and employment, some studies such as Kneller et al. (1999) found that government expenditure enhanced growth while M'Amanja and Morrissey (2005) and Devarajan et al. (1996) found that government expenditure had an insignificant or adverse effect on economic growth. Most of the studies on government expenditure either analyze the entire economy or carry out cross-country analyses. With policy makers increasingly making key decisions on fiscal matters at a sectoral level and the disparity in the performance of individual sectors in Kenya there is a need for more sector-specific studies.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter will outline the research method, the type of estimation and the model. It also gives a brief description and measurement of the variables, the data and data analysis methods that will be used.

3.2 Theoretical Framework

According to Ram (1986) to capture externalities public sector output enters the production function.

$P = P(K_P, L_P, G)$…….. 3.1

$G = G(K_G, L_G)$……....3.2

Where P is private sector output, G is public sector output, K is capital and L is labour.

The total inputs are;

$K = K_P + K_G$

$L = L_P + L_G$

Total output (Y) is the sum of outputs from the private sector and public sector.

$P + G = Y$……..3.3

Assuming constant productivity differential between labour in both sectors.

$G_L/P_L = G_K/P_K = (1+\delta)$……..…..3.4

Where;

G_L is $\triangle G/\triangle L$

P_L is $\triangle P/\triangle L$.

Given that national income, Y is the sum of private and public output if you totally differentiate 3.1 and 3.2 you get

$dY = P_K\, dK_P + G_K\, dK_G + P_L\, dL_P + G_L\, dL_G + P_G\, dG$……....3.5

P_K and G_K are the marginal products of capital in the private and public sectors, P_L and G_L are the marginal products of labour in the private and public sector and P_G is the marginal externality effect of the public on the private sector.

From 3.3 $G_L = (1+\delta)\, P_L$.....3.6

By substituting 3.5 into 3.4 and rearranging the equation you get

$dY = P_K\, dK_P + G_K\, dK_G + P_L(dL_P + dL_G) + \delta\, P_L dL_G + P_G\, dG$……....3.7

Using 3.6

$dG = G_K\, dK_G + (1+\delta)\, P_L\, dL_G$

Therefore

$dG/(1+\delta) - [G_K/(1+\delta)]\, dK_G = P_L\, dL_G$……..…3.8

Substituting 3.8 into 3.7

$dY = P_K\, dK_P + P_L dL_P + (1+P_G) dG$……....3.9

Assuming the existence of a linear relationship between marginal products of labour in each sector and average output per unit of labour in the economy $P_L = Y/L$. Letting $dK_P = I$ gross investment and substituting I into 3.8 and dividing by Y.

$dY/Y = P_K\, I/Y + dL_P/L + [(1+P_G)\, dG]/Y$…….....3.10

Assuming $PK = \alpha$, $(1+P_G) = \gamma$ and including a coefficient for dL_P/Y 3.10 becomes

$dY/Y = \alpha\, (I/Y) + \beta\, (dL_P/L) + \gamma\, (dG/Y)$…….3.11

Where;

dY/Y is economic growth

I/Y is investment to GDP

dL_P/L is growth in the labour force

dG/Y is government consumption to GDP

3.3 Model Specification

The study will utilize data on GDP growth, development expenditure, recurrent expenditure, public sector wage employment and non-public sector wage employment for the four sectors covering the period 1972 to 2011. Because of the data set available which is a time series-oriented panel having four cross-sections over a period of 40 years, the study will use Panel data estimation techniques to estimate the effect of government expenditure and wage employment on sectoral economic growth. Panel data analysis was selected because it improves the efficiency of the estimates; panel data is also more informative, has more variability due to increased degrees of freedom and usually has less collinearity.

From 3.11 the model to be estimated is:

$$g_{it} = a_0 + \alpha_1 NPSE_{it} + \alpha_2 PSE_{it} + \alpha_3 D_{it} + \alpha_4 R_{it} + \varepsilon_{gt} \quad \text{.....3.12}$$

Where;

g_{it} is GDP growth for sector **i** at time **t**

$NPSE_{it}$ is growth in non-public wage employment in sector **i** at time **t**

PSE_{it} is growth public sector wage employment for sector **i** at time **t**

D_{it} is development expenditure in sector **i** at time **t**

R_{it} is recurrent expenditure in sector **i** at time **t**

ε is the error term

3.4 Definition and measurement of variables

Table 3.1 Definition and measurement of variables

S. No	Variable Name	Definition	Measurement
1.	Employment	Provision of services by individuals over the age of 18 years on a full-time or part-time basis in exchange for compensation.	Growth in public sector and non-public sector wage employment in each sector.
2.	Development expenditure	Total expenditures from all the development projects and activities carried out by government Ministries.	The ratio of sectoral government development expenditure to sector GDP.
3.	Recurrent expenditure	Expenditures by the ministries covering day-to-day normal services by the ministry, wages and salaries (labour costs), and operation and maintenance along with minor capital expenditures.	The ratio of sectoral government recurrent expenditure to sector GDP.
4.	Growth	Annual growth rate of the sector GDP.	Percentage growth of real GDP in each sector.

3.5 Data types and sources

This study will use secondary data from the annual statistical abstracts and annual economic surveys prepared by the Kenya National Bureau of Statistics. The data will cover the period 1972-2011.

3.6 Time series data properties

3.6.1 Testing for Stationarity

The Breitung unit root test will be used to test for stationarity of the panel in order to avoid estimating and getting spurious results. The Breitung was chosen over other panel unit root tests that assume all panels have the same autoregressive parameter under the alternative hypothesis of stationarity such as the Harris–Tsavalis test and the Levin–Lin–Chu test because Breitung test can be used when you have both many time periods and many panel cross-sections.

3.7 Hausman Test

The Hausman test is used to choose between fixed effects and random effects in panel data analysis. Fixed effects regression is the model to use when you want to control for omitted variables that differ between cases but are constant over time. It lets you use the changes in the variables over time to estimate the effects of the independent variables on your dependent variable and is the main technique used for the analysis of panel data.

However, if you have reason to believe that some omitted variables may be constant over time but vary between cases, and others may be fixed between cases but vary over time, then you can include both types by using random effects. Random-effects estimator is a weighted average of fixed and between effects. The null hypothesis for the Hausman test is b=B (coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator) therefore you select random effects while the alternative hypothesis is b≠B means it is fixed effects should be used.

3.8 Data analysis

The study will use both descriptive and inferential statistics to analyze the data. Descriptive statistics will be determined for the entire panel and the four individual sectors selected for this study. Based on the results of the Hausman test an appropriate panel data estimation method will be used to estimate the effects of sectoral development and recurrent expenditures on sectoral growth as well as the effects of public sector and non-public sector wage employment on sectoral growth. Panel data analysis was selected because it improves the efficiency of the estimates; panel data is also more informative, has more variability due to increased degrees of freedom and usually has less collinearity.

CHAPTER FOUR: EMPIRICAL FINDINGS

4.1 Introduction

This chapter presents the results of the panel data analysis of the effects of development and recurrent expenditure on the growth of agriculture and forestry, health, education and public administration and defence sectors in Kenya. The chapter also presents the interpretation and discussion of econometric findings with reference to the literature reviewed.

4.2 Government Expenditure and Sectoral Growth

The objective of this study was to determine the effects of government expenditure on agriculture and forestry, education, health and public administration and defence on the growth of the sectors.

4.2.1 Results from Unit Root Test

The panel was tested for stationarity using the Breitung unit root test developed by Breitung (2000); this test does not require bias correction factors. The null hypothesis for the test Ho: panel contains unit roots while the alternative hypothesis Ha: the panels are stationary. The results are presented in table 4.1

Table 4.1: Results from Unit Root Test

Variables		Breitung Unit Root Test	
		t-statistic	p-values
Sectoral GDP Growth Rate	Levels	-4.8992**	0.0000
Growth Rate of Public Sector Employment	Levels	-7.2819**	0.0000
Growth Rate of Non-Public Sector Employment	Levels	-7.3984**	0.0000
The ratio of Development Expenditure in Each Sector to Sectoral GDP	Levels	-1.9222*	0.0273
The ratio of Recurrent Expenditure in Each Sector to Sectoral GDP	Levels	-3.22284**	0.0006
*(**) denotes rejection of the null hypothesis at 5%(1%) significance level			

Source: *Constructed from the Study Data*

The results of the unit root test for the panel showed that sectoral GDP growth, the growth rate of public and non-public sector employment, the ratio of sectoral development expenditure to sectoral GDP and the ratio of sectoral government recurrent expenditure to sectoral GDP were all stationary and integrated of order I (0) at 5% level of significance.

4.2.2 Hausman Test Results

The Hausman test was run in order to choose between fixed effects and random effects. The results of the Hausman test are presented in table 4.2.

Table 4.2 Hausman test results

Variables	(b) fixed	(B) random	b-B Difference	S.E
Public Sector Employment	0.251167	0.2578297	-0.0066627	0.016587
Non-Public Sector Employment	0.0011595	0.024759	-0.0235996	0.0152107
Development Expenditure	0.529694	0.0002647	0.0527048	0.0278867
Recurrent Expenditure	-0.0307689	-0.0065191	-0.0242498	0.0156066
b= consistent under Ho and Ha. B=inconsistent under Ha, efficient under Ho chi2(4) = 4.17 prob>chi2=0.3836				

Source: *Constructed from the Study Data*

The p-value of chi2 for the Hausman test is greater than 0.05, therefore the null hypothesis is not rejected and the random effects method is selected.

Table 4.3 Descriptive Statistics for the Panel

Variables	Mean	Minimum	Maximum	Standard Deviation
Sectoral GDP growth	2.51	-26.4	26.9	7.78
Public Sector Employment	2.55	-22.96	41.19	7.07
Non-Public Sector Employment	4.25	-39.39	93.36	12.19
Development Expenditure	22.75	0.65	137.57	25.05
Recurrent Expenditure	106.64	0.95	452	84.45

Source: *Constructed from the Study Data*

The mean GDP, public and non-public wage employment growth rates for the four sectors over the study period were 2.51%, 2.55% and 4.25% respectively. These growth rates are very low given that Vision 2030 has set a target of a double-digit GDP growth rate and accelerated employment creation as some of the key drivers that will help Kenya become a middle-income country by the year 2030. The average ratio of development expenditure to sectoral GDP is 106.64 % this high mean is a result of consistently high recurrent expenditures in the education, health and public administration sectors and the low GDP of the public administration and defence sector.

The mean development expenditure to GDP ratio for the four sectors is 22.75%, this relatively low mean is a result of relatively low development expenditures in education and agriculture and forestry sector coupled with the fact that agriculture and forestry contributes significantly to the Kenyan GDP. Descriptive statistics for individual sectors are included in the Appendix.

4.3 Effects of government expenditure on sectoral growth

This study used the Panel Least Squares method to determine the effects of government expenditure on sectoral growth the regression results are reported in table 4.3.

Table 4.4 Regression results

Dependent Variable: GDP
Method: Panel Least Squares
Date: 09/13/13 Time: 10:35
Sample: 1972 2011
Cross-sections included: 4
Total panel (balanced) observations: 160
White period standard errors & covariance (d.f. corrected)

Variable	**Coefficient**	**t-Statistic**	**p-value**
Constant	3.619620**	4.686261	0.0000
Public Sector Employment	0.140373**	2.339740	0.0211
Non-Public Sector Employment	0.032846**	2.842178	0.0053
Development Expenditure	0.016869	0.556010	0.5793
Recurrent Expenditure	-0.018605*	-1.873946	0.0635

***(**)** The coefficient is significant at 10% (5%) level of significance
Adjusted R-Squared 0.568509
F-Statistic 5.554118 p-value 0.0000
Durbin-Watson Stat 1.735827

Source: *Constructed from the Study Data*

The results show that 56.85% of the changes in growth of the agricultural and forestry, education, health and public administration and defence sectors are explained by changes in government expenditure, public sector employment and private sector employment therefore

levels of government expenditure and policies that impact on the levels of employment in these sectors should be carefully considered given their impact on sectoral growth.

Government recurrent expenditure has a negative and statistically significant relationship with sectoral growth, this means that an increase in recurrent expenditure that is channelled towards agriculture and forestry, education, health and public administration and defence leads to a decrease in the sectoral GDP growth rates. A unit increase in the recurrent expenditure to sectoral GDP ratio in the above four sectors causes a 0.018% decrease in the sectoral GDP holding development expenditure, public sector and non-public sector wage employment constant. According to Njeru (2003), recurrent expenditure in Kenya consists mainly of expenditures by the ministries covering day-to-day activities, paying salaries and wages, paying for services, operation, maintenance and minor capital expenditures.

The results showing that recurrent government expenditure has a negative effect on sectoral growth are consistent with economic theory. Monetarists believe that monetary policy does a better job than fiscal policy because excessive government spending interferes with the working of free markets, causes large deficits and bloated and inefficient bureaucracies that are detrimental to economic growth (Gordon, 1974).

The negative relationship between recurrent expenditure can also be explained by the crowding out theory. Indirect crowding out occurs when private sector investment and production is discouraged by higher taxes and borrowing by the government as it seeks resources to maintain its operations (Bailey, 2002). This may hold true for a country like Kenya where the government levies relatively higher taxes and borrows to maintain a high public service wage bill and to provide essential services to its citizens.

Development expenditure in agriculture and forestry, health, education and public administration and defence has a positive but statistically insignificant relationship with sectoral GDP growth. The positive relationship is consistent with other studies such as Ram (1986) which found that government expenditure had a positive effect on economic performance and growth. Positive externality effects of government activities such as the provision of relevant infrastructure, investment, security and regulation which in Kenya is provided through development expenditure allocations in each sector promote private sector investment and production therefore inducing sectoral economic growth.

The positive relationship between sectoral government development expenditure and sectoral growth is consistent with theory. According to the Keynesian theory expanding government expenditure increases aggregate demand and also has a positive impact on employment creation both in the public and private sector which have a positive effect on economic growth. Barro (1990) points out that productive government expenditure and expenditures that enhance property rights also promote growth and savings.

According to Deverajan et al. (1996), the insignificant effect of government development expenditure and other productive expenditures in developing countries like Kenya is because developing countries may have excessive capital expenditures which make them unproductive at the margin. M'Amanja and Morrissey (2005) also pointed out that expenditures included under a given classification like development expenditure for this study may not all be truly development expenditures which may explain the statistically insignificant relationship.

Sometimes development expenditures by the government are used to finance development projects that are a duplication of projects being financed by off-budget grants provided by bilateral development partners. This duplication occurs because the development

partners do not share with the Government of Kenya information on projects implemented through non-governmental organizations. The duplication of development projects could also explain why the coefficient for development expenditure was statistically insignificant.

Public sector wage employment has a positive and statistically significant relationship with sectoral economic growth. A one percent increase in public sector wage employment in the above four sectors causes a 0.14% increase in sectoral GDP holding non-public sector wage employment, government development and recurrent expenditure constant.

The positive relationship between public sector wage employment and spectral GDP growth may be attributed to public sector reforms in Kenya in the nineties and early naughties such as the introduction of performance contracts, outsourcing of some services, retrenchment and the government being able to meet its wage bill through locally generated revenue which has improved the productivity of public servants.

Growth in private-sector wage employment has a positive and statistically significant effect on sectoral growth. A one percent increase in non - public sector wage employment in the four sectors causes an increase of 0.033% in sectoral GDP holding public sector wage employment, government development and recurrent expenditure constant.

The positive relationship between non-public sector wage employment and sectoral growth is consistent with economic theory. Monetarists trust free markets and believe that the private sector is more efficient than the public sector, hence labour productivity in the private sector and competitive wages that are determined by the market ensure that growth in wage employment in the private sector has a positive effect on sectoral growth.

In conclusion, it is important to note that public sector wage employment, non-public sector wage employment and development expenditure have a positive relationship with

economic growth in agriculture and forestry, health, education and public administration and defence while recurrent expenditures in the above sectors have a negative relationship with sectoral growth. The government should therefore consider reducing unnecessary recurrent expenditures in these sectors and pursue policies that promote employment creation as well as increase some components of development expenditures in the four sectors to ensure sustained economic growth.

CHAPTER FIVE: SUMMARY CONCLUSION AND POLICY RECOMMENDATIONS

5.1Introduction

This chapter provides a summary of the study and makes conclusions based on the results. The policy recommendations from the findings and areas for future research are also presented.

5.2 Summary

The rapid growth of both sectoral government recurrent and development expenditure in Kenya as well as the slow growth of wage employment levels has raised concerns among policy makers on the effects of these growth levels on economic growth at the sectoral level. Although the whole economy has experienced positive growth in most years since Kenya's independence in 1963 at the sectoral level, the agricultural and forestry, education, health and public administration and defence sectors have all experienced negative growth in some years between 1972 and 2011.

The agriculture and forestry sector is one of the most important sectors for the Kenyan economy contributing 24% of Kenya's GDP in 2011. M'amanja and Morrissey (2005) found that human capital development was the most important determinant of overall GDP growth in Kenya, the education and health sectors are very important sectors in developing the human capital in any country. According to Barro (1990), the public administration and defence sector plays a critical role in encouraging private sector investment, savings and economic growth through enhanced property rights.

The specific objectives of this study were to determine the effects of sectoral development and recurrent expenditures on the economic growth of the above four sectors as

well as to determine the effect of public sector and non-public sector wage employment on sectoral growth. The study used Panel Least Squares method and panel data for the agriculture and forestry, education, health and public administration and defence sectors covering the period 1972-2011 to determine the empirical effect of government expenditure and wage employment on sectoral growth. The study used data on annual GDP growth, recurrent and development expenditure channelled to the four sectors and public sector and non-public sector wage employment in the four sectors.

From the econometric analysis, the study found that development expenditure, public sector wage employment and non-public sector wage employment had a positive effect on sectoral growth. Recurrent expenditure was found to have a negative effect on growth, only development expenditure was found to have a statistically insignificant relationship all the other variables' coefficients were statistically significant.

5.3 Conclusion

Government expenditure and wage employment play a critical role in determining economic growth in agriculture and forestry, education, health and public administration and defence sectors. Recurrent expenditures channelled to the four sectors have a negative effect on growth whereas development expenditure, public sector wage employment and non-public sector wage employment all have a positive effect on sectoral economic growth. If government expenditure policies in the four sectors continue to promote employment creation and successful development projects while reducing wasteful recurrent expenditures the four sectors will experience higher economic growth *ceteris paribus*.

5.4 Policy Recommendations

The government should reduce wasteful recurrent expenditures in agriculture and forestry, education, health and public administration and defence sectors this can be achieved through the reduction in the day-to-day running expenses of ministries and government departments in the four sectors. The reduction in expenses can be achieved through outsourcing of some of the functions such as vehicle operation and maintenance, use of modern technology such as video conferencing and adoption of paperless operations to improve efficiency and cut down on maintenance, travel and stationary expenditures.

The government should increase development expenditures in the four sectors especially those expenditures channelled towards priority development projects, provision of sector-relevant infrastructure, provision of security and improvement of government operations. The government should also pursue public-private partnerships to encourage private sector participation in large development projects within these sectors this will also serve to reduce the implementation costs of the development projects.

Some of the expenditures the government classifies as development expenditures such as the purchase of new furniture and salaries of staff implementing donor-funded development projects should be reclassified to ensure that only expenditures that are strictly meant for development are included in the budget as development expenditures.

The government should provide the necessary environment such as lower taxes for small and medium enterprises, provision of infrastructure such as roads and railways as well as investments in the education sector to promote employment creation in the private sector. The government can also take proactive measures to develop individual savings accounts and address distortions from high labour tax wages to promote employment creation.

The government should take additional steps to improve the productivity of public sector employees through capacity building, improving the performance contracting tools and promotion of civil servants based on performance and effort not on the number of years worked. The government should also use other incentives such as affordable mortgages for civil servants to help attract and retain highly skilled employees in the public sector, using such incentives instead of higher salaries will also help reduce recurrent expenditures which have a negative relationship with sectoral growth.

The government should come up with effective mechanisms such as a countrywide electronic system that is known to all Kenyans, easy to use and accessible by both donors and beneficiaries to capture and track off-budget aid from donor countries and agencies. This system will reduce duplication of development projects because sometimes development expenditures from the government are used to finance projects that are a duplication of projects that are funded by off-budget grants.

5.5 Areas of future research

Areas that could be targeted for future analysis of government expenditure and sectoral growth are the counties in Kenya and parastatals. This is because chapter twelve of the Constitution of Kenya 2010 provides for the allocation of not less than 15% of all revenues raised nationally by the national government to be administered and spent by county governments. In the financial year 2013/2014 national budget, 210 billion Kenya shillings was transferred by the national government to be managed and spent by the 47 counties in Kenya. There are also numerous parastatals, especially in the agriculture and health sectors which have large budgets that are met by the national government. There is therefore need to establish the

contribution of devolved funds and the large sums of money spent by some of the parastatals to sectoral economic growth.

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APPENDIX

TABLE A1: Sectoral GDP growth and sectoral wage employment growth (%) 1972 to 2011

SECTOR	YEAR	GDP Growth rate %	Growth in Public Sector Wage Employment %	Growth in Non-Public Sector Wage Employment %
Agriculture and forestry	**1972**	7.7	7.26265	5.6253
Agriculture and forestry	**1973**	1.1	-8.56594	25.2608
Agriculture and forestry	**1974**	2.0	5.862254	-3.09777
Agriculture and forestry	**1975**	7.2	-5.45324	-8.39973
Agriculture and forestry	**1976**	2.0	1.144629	0.979105
Agriculture and forestry	**1977**	10.3	18.79288	4.405993
Agriculture and forestry	**1978**	2.1	0.388115	-8.45223
Agriculture and forestry	**1979**	-0.3	12.21073	2.583981
Agriculture and forestry	**1980**	-1.1	-2.96571	-11.016
Agriculture and forestry	**1981**	-12.5	5.130732	0.666667
Agriculture and forestry	**1982**	3.4	-8.98337	-3.51569
Agriculture and forestry	**1983**	3.1	-4.52221	5.818138
Agriculture and forestry	**1984**	-3.1	0.561599	2.413519
Agriculture and forestry	**1985**	0.1	1.490467	2.700306
Agriculture and forestry	**1986**	10.4	1.038573	2.729588
Agriculture and forestry	**1987**	0.1	3.332552	3.394148
Agriculture and forestry	**1988**	6.1	17.46392	-2.67889
Agriculture and forestry	**1989**	5.8	1.089024	0.518258
Agriculture and forestry	**1990**	-7.4	-22.9641	12.15318
Agriculture and forestry	**1991**	4.2	35.72192	-7.56208
Agriculture and forestry	**1992**	9.2	-0.32049	1.046422
Agriculture and forestry	**1993**	-1.6	-3.62139	1.451889
Agriculture and forestry	**1994**	-5.1	-0.59113	3.469241
Agriculture and forestry	**1995**	4.5	-1.05534	6.455216
Agriculture and forestry	**1996**	5.7	-1.27189	4.298525
Agriculture and forestry	**1997**	-3.1	-2.93816	1.930913
Agriculture and forestry	**1998**	-0.2	0.25614	1.674131
Agriculture and forestry	**1999**	-15.5	-2.63847	1.794622
Agriculture and forestry	**2000**	-2.1	-3.1171	0.706395
Agriculture and forestry	**2001**	10.5	-8.34222	2.146097
Agriculture and forestry	**2002**	-3.1	2.552071	-0.16554
Agriculture and forestry	**2003**	2.6	-1.40757	1.299993
Agriculture and forestry	**2004**	1.6	-1.17791	2.001995
Agriculture and forestry	**2005**	6.9	-1.69203	2.897987
Agriculture and forestry	**2006**	4.4	-1.07207	2.867743
Agriculture and forestry	**2007**	2.4	-6.05061	3.048918
Agriculture and forestry	**2008**	-4.1	0.360954	0.234703
Agriculture and forestry	**2009**	-2.6	2.593823	-0.58746

SECTOR	YEAR	GDP Growth rate %	Growth in Public Sector Wage Employment %	Growth in Non-Public Sector Wage Employment %
Agriculture and forestry	**2010**	6.4	-0.95643	1.371533
Agriculture and forestry	**2011**	1.5	1.78513	0.398902
Health	**1972**	14.0	2.42657	4.5984
Health	**1973**	-3.7	-3.73187	8.456607
Health	**1974**	9.0	9.079384	9.3203
Health	**1975**	13.2	8.350469	9.794136
Health	**1976**	0.9	0.870534	5.719697
Health	**1977**	11.5	6.752832	5.284844
Health	**1978**	6.2	5.295019	0.86779
Health	**1979**	3.1	14.58773	3.323212
Health	**1980**	7.5	8.27538	18.31837
Health	**1981**	-12.7	4.563451	-0.0552
Health	**1982**	-2.3	5.02903	-0.26232
Health	**1983**	-3.1	5.487903	9.191584
Health	**1984**	-5.4	-0.7772	7.238844
Health	**1985**	6.4	8.200235	-2.93179
Health	**1986**	11.3	0.73571	12.94605
Health	**1987**	6.7	1.198502	30.23507
Health	**1988**	3.2	6.78664	-18.5792
Health	**1989**	12.7	8.135858	-39.3939
Health	**1990**	1.7	-5.82909	93.3557
Health	**1991**	4.0	3.290649	7.20236
Health	**1992**	8.6	2.802776	5.844261
Health	**1993**	-9.6	3.335337	15.99878
Health	**1994**	-26.4	1.242609	14.99868
Health	**1995**	8.9	0.503581	18.73531
Health	**1996**	6.6	1.377431	19.04785
Health	**1997**	4.0	2.98241	12.71496
Health	**1998**	-2.0	4.321247	10.36307
Health	**1999**	1.4	-0.39358	8.825927
Health	**2000**	4.4	0.551438	7.564863
Health	**2001**	1.8	-2.87655	5.629056
Health	**2002**	3.4	0.397418	3.662588
Health	**2003**	2.8	1.502776	3.968153
Health	**2004**	3.8	0.839965	6.048002
Health	**2005**	3.2	1.146207	4.344215
Health	**2006**	3.3	1.33391	4.278323
Health	**2007**	3.2	-0.23732	4.798253
Health	**2008**	3.6	-0.31318	6.753531
Health	**2009**	4.4	0.080688	-29.6983
Health	**2010**	1.4	0.447715	12.83226

SECTOR	YEAR	GDP Growth rate %	Growth in Public Sector Wage Employment %	Growth in Non-Public Sector Wage Employment %
Health	**2011**	3.5	0.597708	12.7228
Education	**1972**	15.30	8.68449	11.5681
Education	**1973**	5.30	10.53575	-22.835
Education	**1974**	19.40	33.98733	27.7116
Education	**1975**	10.90	9.364663	-4.70054
Education	**1976**	7.60	1.933681	6.709594
Education	**1977**	1.50	4.270736	15.00121
Education	**1978**	6.20	-3.98216	-1.36426
Education	**1979**	1.46	5.612881	18.9701
Education	**1980**	10.5	15.97882	7.610445
Education	**1981**	-12.4	1.928992	11.43522
Education	**1982**	-5.3	7.665475	5.995973
Education	**1983**	-5.1	3.826712	22.52164
Education	**1984**	-1.2	10.45558	13.13885
Education	**1985**	11.5	2.947607	17.83575
Education	**1986**	20.6	2.904203	6.620434
Education	**1987**	4.6	3.20455	2.298711
Education	**1988**	7.5	1.291447	15.29105
Education	**1989**	5.8	6.488166	-25.1593
Education	**1990**	-3.6	5.008375	15.70324
Education	**1991**	5.5	6.07961	5.945411
Education	**1992**	8.9	-6.02967	65.44076
Education	**1993**	-19.8	1.09491	1.317987
Education	**1994**	-18.3	2.002189	2.20074
Education	**1995**	26.9	2.157197	3.859901
Education	**1996**	3.9	5.732765	4.079491
Education	**1997**	14.4	3.091004	3.03849
Education	**1998**	15.6	4.830153	4.220805
Education	**1999**	-0.8	-0.32858	8.918346
Education	**2000**	0.5	0.654179	7.664064
Education	**2001**	1.4	-4.06745	8.394575
Education	**2002**	2.8	1.21275	6.098966
Education	**2003**	9.7	1.668759	5.664843
Education	**2004**	2.1	-1.87158	16.2086
Education	**2005**	0.7	0.482198	2.953515
Education	**2006**	0.3	0.475844	-6.13512
Education	**2007**	4.2	3.884811	2.073116
Education	**2008**	5.9	5.01043	1.489638
Education	**2009**	2.7	2.41756	8.106731
Education	**2010**	4.5	2.066511	3.74522
Education	**2011**	4.9	4.928239	3.371706

SECTOR	YEAR	GDP Growth rate %	Growth in Public Sector Wage Employment %	Growth in Non-Public Sector Wage Employment %
Public Administration and Defence	**1972**	9.70	2.78	-
Public Administration and Defence	**1973**	4.10	1.284101	-
Public Administration and Defence	**1974**	6.70	4.955196	-
Public Administration and Defence	**1975**	5.90	0.415082	-
Public Administration and Defence	**1976**	2.10	8.069307	-
Public Administration and Defence	**1977**	3.80	-0.82684	-
Public Administration and Defence	**1978**	7.40	5.877734	-
Public Administration and Defence	**1979**	1.6	10.42448	-
Public Administration and Defence	**1980**	5.9	14.61984	-
Public Administration and Defence	**1981**	-10.6	4.99707	-
Public Administration and Defence	**1982**	-9.7	5.450278	-
Public Administration and Defence	**1983**	-6.6	8.940913	-
Public Administration and Defence	**1984**	-7.3	1.420958	-
Public Administration and Defence	**1985**	2.0	11.74656	-
Public Administration and Defence	**1986**	14.1	2.819574	-
Public Administration and Defence	**1987**	13.6	5.727896	-
Public Administration and Defence	**1988**	14.4	6.511768	-
Public Administration and Defence	**1989**	20.9	1.148149	-
Public Administration and Defence	**1990**	2.3	-0.8547	-
Public Administration and Defence	**1991**	4.9	1.330018	-

SECTOR	YEAR	GDP Growth rate %	Growth in Public Sector Wage Employment %	Growth in Non-Public Sector Wage Employment %
Public Administration and Defence	**1992**	8.4	-0.98415	-
Public Administration and Defence	**1993**	-8.5	-2.03765	-
Public Administration and Defence	**1994**	-14.2	-0.56889	-
Public Administration and Defence	**1995**	-5.1	-1.78253	-
Public Administration and Defence	**1996**	5.4	-2.25941	-
Public Administration and Defence	**1997**	0.5	-2.3776	-
Public Administration and Defence	**1998**	5.8	-0.12447	-
Public Administration and Defence	**1999**	-24.5	-2.8967	-
Public Administration and Defence	**2000**	-0.4	-1.52914	-
Public Administration and Defence	**2001**	-3.1	-5.90743	-
Public Administration and Defence	**2002**	-0.1	-0.55672	-
Public Administration and Defence	**2003**	0.6	-0.53862	-
Public Administration and Defence	**2004**	0.1	-1.16309	-
Public Administration and Defence	**2005**	-1.3	-3.30902	-
Public Administration and Defence	**2006**	-1.6	-3.93309	-
Public Administration and Defence	**2007**	-2.1	-7.13129	-

SECTOR	YEAR	GDP Growth rate %	Growth in Public Sector Wage Employment %	Growth in Non-Public Sector Wage Employment %
Public Administration and Defence	**2008**	0.6	-2.10334	-
Public Administration and Defence	**2009**	1.6	41.18972	-
Public Administration and Defence	**2010**	2.3	0.954127	-
Public Administration and Defence	**2011**	2.5	2.586439	-

Source of data: *KNBS statistical abstracts*

TABLE A2: Sectoral Development and Recurrent Expenditure as Percentage of Sectoral GDP 1972 to 2011

SECTOR	YEAR	Sectoral Development Expenditure as Share of Sectoral GDP (%)	Sectoral Recurrent Expenditure as Share of Sectoral GDP (%)
Agriculture and forestry	**1972**	2.582447	3.37
Agriculture and forestry	**1973**	3.169965	3.86
Agriculture and forestry	**1974**	4.72939	3.83
Agriculture and forestry	**1975**	6.895683	5.49
Agriculture and forestry	**1976**	4.442587	3.57
Agriculture and forestry	**1977**	4.91572	3.27
Agriculture and forestry	**1978**	6.021336	3.52
Agriculture and forestry	**1979**	5.325993	3.09
Agriculture and forestry	**1980**	5.994089	4.54
Agriculture and forestry	**1981**	6.197476	4.89
Agriculture and forestry	**1982**	4.688232	4.33
Agriculture and forestry	**1983**	2.432556	4.56
Agriculture and forestry	**1984**	2.002875	5.54
Agriculture and forestry	**1985**	3.924442	5.15
Agriculture and forestry	**1986**	5.040695	5.44
Agriculture and forestry	**1987**	4.62051	5.26
Agriculture and forestry	**1988**	1.649336	1.94
Agriculture and forestry	**1989**	1.562032	2.07
Agriculture and forestry	**1990**	2.259432	2.46
Agriculture and forestry	**1991**	0.823618	0.95
Agriculture and forestry	**1992**	2.77273	1.98
Agriculture and forestry	**1993**	4.562817	2.96
Agriculture and forestry	**1994**	3.381521	2.81
Agriculture and forestry	**1995**	2.245223	3.00
Agriculture and forestry	**1996**	1.681121	3.03
Agriculture and forestry	**1997**	1.363008	2.88
Agriculture and forestry	**1998**	1.859767	2.73
Agriculture and forestry	**1999**	1.18699	1.82
Agriculture and forestry	**2000**	0.891957	2.08
Agriculture and forestry	**2001**	0.69667	2.24
Agriculture and forestry	**2002**	0.653322	2.84
Agriculture and forestry	**2003**	1.039067	3.01
Agriculture and forestry	**2004**	1.147484	2.86
Agriculture and forestry	**2005**	0.698871	2.78
Agriculture and forestry	**2006**	1.08255	2.87
Agriculture and forestry	**2007**	1.730896	3.09

SECTOR	YEAR	Sectoral Development Expenditure as Share of Sectoral GDP (%)	Sectoral Recurrent Expenditure as Share of Sectoral GDP (%)
Agriculture and forestry	**2008**	2.768765	3.84
Agriculture and forestry	**2009**	3.921959	5.53
Agriculture and forestry	**2010**	4.889964	5.88
Agriculture and forestry	**2011**	6.891231	5.56
Health	**1972**	23.47	99.17
Health	**1973**	19.28	97.17
Health	**1974**	25.87	128.71
Health	**1975**	35.26	155.04
Health	**1976**	49.18	153.43
Health	**1977**	45.87	144.76
Health	**1978**	39.73	166.19
Health	**1979**	29.60	125.09
Health	**1980**	32.40	131.88
Health	**1981**	28.79	135.01
Health	**1982**	19.70	126.32
Health	**1983**	17.95	118.72
Health	**1984**	18.90	119.02
Health	**1985**	18.42	114.79
Health	**1986**	18.50	112.44
Health	**1987**	16.45	114.40
Health	**1988**	18.31	114.26
Health	**1989**	20.31	103.51
Health	**1990**	23.92	93.76
Health	**1991**	26.03	96.51
Health	**1992**	27.50	95.33
Health	**1993**	35.87	93.84
Health	**1994**	36.40	124.62
Health	**1995**	29.13	139.46
Health	**1996**	41.28	147.79
Health	**1997**	51.95	137.57
Health	**1998**	38.97	140.69
Health	**1999**	8.39	123.13
Health	**2000**	2.19	42.61
Health	**2001**	4.69	51.88
Health	**2002**	4.71	54.24
Health	**2003**	5.61	51.98
Health	**2004**	6.28	53.57
Health	**2005**	10.59	56.20
Health	**2006**	18.56	66.01
Health	**2007**	18.17	76.71

SECTOR	YEAR	Sectoral Development Expenditure as Share of Sectoral GDP (%)	Sectoral Recurrent Expenditure as Share of Sectoral GDP (%)
Health	**2008**	16.18	83.14
Health	**2009**	22.84	88.05
Health	**2010**	35.44	98.60
Health	**2011**	63.19	114.63
Education	**1972**	10.81102	132.88
Education	**1973**	8.068298	102.15
Education	**1974**	10.02179	120.57
Education	**1975**	7.801491	117.06
Education	**1976**	6.619056	121.98
Education	**1977**	6.020544	99.92
Education	**1978**	48.47899	72.74
Education	**1979**	34.92668	60.06
Education	**1980**	9.222986	92.40
Education	**1981**	8.711207	96.23
Education	**1982**	7.839932	93.16
Education	**1983**	7.261821	93.07
Education	**1984**	6.463435	93.46
Education	**1985**	5.174875	95.50
Education	**1986**	5.530729	91.74
Education	**1987**	6.207726	97.43
Education	**1988**	5.326057	95.39
Education	**1989**	6.336236	94.76
Education	**1990**	9.218025	96.82
Education	**1991**	8.780337	89.38
Education	**1992**	7.658062	85.20
Education	**1993**	7.208862	96.13
Education	**1994**	7.465017	113.79
Education	**1995**	6.237125	96.44
Education	**1996**	5.738797	99.42
Education	**1997**	4.269433	93.90
Education	**1998**	3.583863	89.38
Education	**1999**	2.214752	81.77
Education	**2000**	1.208157	78.64
Education	**2001**	4.664524	79.02
Education	**2002**	6.164206	88.36
Education	**2003**	6.976142	95.03
Education	**2004**	8.141989	104.28
Education	**2005**	7.777092	114.64
Education	**2006**	10.5085	128.34
Education	**2007**	13.86535	141.31

SECTOR	YEAR	Sectoral Development Expenditure as Share of Sectoral GDP (%)	Sectoral Recurrent Expenditure as Share of Sectoral GDP (%)
Education	**2008**	15.13428	153.16
Education	**2009**	17.59504	165.51
Education	**2010**	18.75928	180.68
Education	**2011**	23.97241	200.19
Public Administration and Defence	**1972**	20.71454	125.18
Public Administration and Defence	**1973**	16.82093	114.53
Public Administration and Defence	**1974**	14.02712	134.64
Public Administration and Defence	**1975**	45.9791	163.84
Public Administration and Defence	**1976**	59.39173	199.67
Public Administration and Defence	**1977**	45.75413	217.38
Public Administration and Defence	**1978**	54.94334	289.19
Public Administration and Defence	**1979**	65.24558	311.83
Public Administration and Defence	**1980**	62.66067	222.94
Public Administration and Defence	**1981**	51.84897	214.83
Public Administration and Defence	**1982**	39.27684	221.13
Public Administration and Defence	**1983**	30.24512	224.52
Public Administration and Defence	**1984**	39.53791	220.48
Public Administration and Defence	**1985**	45.34137	199.94
Public Administration and Defence	**1986**	64.09021	189.17
Public Administration and Defence	**1987**	64.44843	202.98
Public Administration and Defence	**1988**	49.75324	190.46
Public Administration and Defence	**1989**	58.53617	166.86
Public Administration and Defence	**1990**	61.91799	164.20
Public Administration and Defence	**1991**	49.60604	149.90
Public Administration and Defence	**1992**	44.63186	145.10
Public Administration and Defence	**1993**	40.75462	145.08
Public Administration and Defence	**1994**	55.64661	163.35
Public Administration and Defence	**1995**	60.30274	206.20
Public Administration and Defence	**1996**	53.35926	230.81
Public Administration and Defence	**1997**	47.49966	231.81
Public Administration and Defence	**1998**	31.55989	229.51
Public Administration and Defence	**1999**	44.90549	277.89
Public Administration and Defence	**2000**	22.69177	113.81
Public Administration and Defence	**2001**	22.493	136.31
Public Administration and Defence	**2002**	20.7755	145.87
Public Administration and Defence	**2003**	27.63423	161.20
Public Administration and Defence	**2004**	33.54384	181.93
Public Administration and Defence	**2005**	35.00043	173.02
Public Administration and Defence	**2006**	62.66064	181.65
Public Administration and Defence	**2007**	126.4859	254.28

SECTOR	YEAR	Sectoral Development Expenditure as Share of Sectoral GDP (%)	Sectoral Recurrent Expenditure as Share of Sectoral GDP (%)
Public Administration and Defence	**2008**	119.1669	299.45
Public Administration and Defence	**2009**	87.96496	341.48
Public Administration and Defence	**2010**	96.87416	395.02
Public Administration and Defence	**2011**	137.5687	452.00

Source: *Constructed from the Study Data*

Table A3 Descriptive Statistics for the Agriculture and Forestry Sector

Variables	Mean	Minimum	Maximum	Standard Deviation
Sectoral GDP growth (%)	1.49	-15.5	10.5	5.71
Public Sector Employment Growth (%)	0.73	-22.96	35.72	8.92
Non-Public Sector Employment Growth (%)	1.57	-11.02	25.26	5.74
Development Expenditure to Sectoral GDP Ratio (%)	3.11	0.65	6.90	1.92
Recurrent Expenditure to Sectoral GDP Ratio(%)	3.52	0.95	5.88	1.26

Source: *Constructed from the Study Data*

Table A4 Descriptive Statistics for the Education Sector

Variables	Mean	Minimum	Maximum	Standard Deviation
Sectoral GDP growth (%)	4.41	-19.80	26.90	9.22
Public Sector Employment Growth (%)	4.19	-6.03	33.99	6.37
Non-Public Sector Employment Growth (%)	7.58	-25.16	65.44	13.62
Development Expenditure to Sectoral GDP Ratio (%)	9.95	1.21	48.48	8.71
Recurrent Expenditure to Sectoral GDP Ratio (%)	106.05	60.06	200.19	28.65

Source: *Constructed from the Study Data*

Table A5 Descriptive Statistics for the Health Sector

Variables	Mean	Minimum	Maximum	Standard Deviation
Sectoral GDP growth (%)	2.86	-26.40	14.00	7.38
Public Sector Employment Growth (%)	2.71	-5.83	14.59	3.93
Non-Public Sector Employment Growth	7.85	-39.39	93.36	18.37
Development Expenditure to Sectoral GDP Ratio (%)	25.15	2.19	63.19	13.92
Recurrent Expenditure to Sectoral GDP ratio (%)	107.26	42.61	166.19	32.29

Source: *Constructed from the Study Data*

Table A6 Descriptive Statistics for the Public Administration and Defence Sector

Variables	Mean	Minimum	Maximum	Standard Deviation
Sectoral GDP growth (%)	1.30	-24.50	20.90	8.27
Public Sector Employment Growth (%)	2.56	-7.13	41.19	7.86
Non-Public Sector Employment Growth (%)	-	-	-	-
Development Expenditure to Sectoral GDP Ratio (%)	52.79	14.03	137.57	28.12
Recurrent Expenditure to Sectoral GDP Ratio (%)	209.74	113.81	452.00	73.52

Source: *Constructed from the Study Data*