The Determinants of Government Expenditure in South Africa

by

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DECLARATION

Student number: 47294817

I declare that "***The Determinants of Government Expenditure in South Africa***" is my own work and that all the sources that I have used or quoted from have been indicated and acknowledged by means of complete references.

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ABSTRACT

This study empirically examines the determinants of government expenditure in South Africa using annual data for the period from 1970 to 2014; and provides an overview of the South African government expenditure. The Johansen-Juselius co-integration test established that there is a long-run relationship between government expenditure and its determinants. The error correction model was used to examine the key determinants. The results of this study show that urbanisation rate, national income, poverty reduction; trade openness lagged one period and the wage rate significantly influence the size of government expenditure. Therefore, the study recommend that government create job opportunities; increase its expenditure in developing rural areas; and find ways to manage the public sector wage bill. The study concludes that population growth, inflation and trade openness in current period are not important in determining government expenditure in South Africa.

KEY TERMS

Government expenditure; Poverty reduction; Urbanisation rate; National income; Population growth; Wage rate; Trade openness; Inflation rate; Error correction model

ACKNOWLEDGEMENTS

TO GOD BE THE GLORY

DEDICATION

"To my children Mahlatse and Neo Ramalobela"

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AD	Aggregate Demand
ADF	Augmented Dickey Fuller
AsgiSA	Accelerated and Shared Growth Initiative for South Africa
AR	Autoregressive
CLRM	Classical Linear Regression Model
CSG	Child Support Grant
DF	Dickey-Fuller
DF-GLS	Dickey-Fuller Generalised Least Square
DW	Durbin-Watson
ECM	Error Correction Model
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
INF	Inflation rate
JB	Jarque-Berra
LM	Langrage Multiplier
MTEF	Medium-Term Expenditure Framework
NDP	National Development Plan
NGP	New Growth Path
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PG	Population Growth
PP	Phillips-Perron
POV	Poverty
RDP	Reconstruction and Development Programme
SARB	South African Reserve Bank
StatsSA	Statistics South Africa
TO	Trade Openness
URB	Urbanisation
VAR	Vector Autoregression
VECM	Vector Error Correction Model
WR	Wage Rate
Y	National Income

CHAPTER ONE : INTRODUCTION

1.1 Background of the Study

Government expenditure is on the increase in almost every country, including South Africa. The government provides goods and services to the public through income distribution and resources allocation. This is because market mechanisms are failing to correct the economic problems and allocating the economic resources. Market failures are the reasons the government is required to provide public goods and services (Musgrave, 1989).

The factors that are influencing government expenditure growth have been a central concern for economists going back as far as Wagner (1893). Many studies have proposed the factors that determine government expenditure as demographic factors such as population growth and urbanisation (Shelton, 2007; Kimakova, 2009); and macro-economic variables such as inflation, public debt and openness (Rodrik, 1998; Shonchoy, 2010; Zakaria & Shakoor, 2011). According to Meltzer and Richard (1981), income inequality may create demand for more redistribution, thus leading to a bigger government. Wagner (1890) suggests that government spending has a tendency to increase relative to national income while the Keynesian believes that the increase in national income is caused by the growth in government expenditure.

In a study regarding South Africa, Seeber and Dockel (1978) outlined the factors influencing government expenditure as the needs of the citizens; the stage of country development; political process including budgetary procedures; and the efficiency of the government in providing services to its people. In addition, Thamae (2013:1) states, "an excessive growth of government spending is often alleged to be economically destructive and this is because different ways of financing government expenditure such as taxation, borrowing and creating money are considered to have adverse effects on the economy." As suggested by Alm and Embaye (2013), the negative effects include slow economic growth, large government deficits, inflation, rising interest rates, trade deficits and falling exchange rates.

In South Africa, government expenditure is divided into capital and recurrent expenditure (Mohr, 2005). The main areas of government spending are on social

services, education, health, security and defence. The provision of public goods and services by the government in South Africa has further contributed to the increase in government expenditure. Government spending has continued to rise due to an increase in demand for public goods such as healthcare, electricity and education. Social services provided by the government in South Africa makes up 57% of public expenditure, which was 49% a decade ago (National Treasury, 2012). The level of government expenditure as ratio of gross domestic product (GDP) has been showing an increasing trend since 1970. It has increased from 19.4% in 1970 to 29.2% in 2014. The data also show that government consumption expenditure has increased from R138653 million in 1970 to R615567 million in 2014 (SARB data, 2015). In the 2012/13 financial year, the budget exceeded R1 trillion for the first time. For the 2013/14, the budget increased by about 8.9% to R1.15 trillion and the bulk was allocated to social services that include health, education, housing and social welfare (National Treasury, 2013). Given such ballooning expenditure, this study, therefore, aims to determine the factors behind the increasing government expenditure in South Africa during the period from 1970 to 2014.

1.2 Statement of the Problem and the Significance of the Study

The growth of government expenditure has an impact on the economic growth of a country (Cooray, 2009). Mo (2007) suggests that all other government expenditures, except investment, have a negative impact on economic growth. The negative impact of the government expenditure on the economic growth could be detrimental to the economy as it could lead to unemployment and low levels of investment if there is slow growth rate. Since the government finances it spending with taxes, an increase in government expenditure increases the tax burden on citizens, which leads to a reduction in private spending and investment (Stratmann & Okolski, 2010). Therefore, the study seeks to find out the factors responsible for the continuous increase of government expenditure in South Africa.

Many of the studies on the determinants of government expenditure are on the developed countries. There are a few studies on the determinants of government expenditure that have been done in developing countries, in general, and in South Africa, in particular. Some of the studies done in South Africa focused on the

relationship between government expenditure and income. These include Ansari *et al* (1997); Akitoby *et al.* (2006); Ziramba (2008); and Menyah and Wolde-Rufael (2012).

Although there are a number of studies on the dynamics of government expenditure in South Africa, very few studies have studied the key determinants of government expenditure in particular. Some of the studies include Seeber and Dockel (1978); Abedian and Standish (1984); and Alm and Embaye (2010). This study is different from other studies in South Africa in a number of ways. Firstly, it uses a recent sample period to re-examine the determinants of government expenditure. Secondly, the study uses a fully specified government expenditure model to examine the determinants of government expenditure. This study will use more explanatory variables. By using more variables, the results are expected to give a full picture of the determinants of government expenditure.

This study will benefit the policymakers in understanding the specific drivers of increased government expenditure. Policy makers need reliable information on the factors that determine government expenditure. Therefore, this study is important as it will provide valuable information to policy makers in the public sector, which will assist in the formulation of policies. It will also contribute to literature in South Africa by providing a new understanding into the drivers of government expenditure in the country.

1.3 Objectives of the Study

The primary objective of the study is to empirically examine the determinants of government expenditure in South Africa using time-series data from 1970 to 2014. The study specifically aims to:

i)   identify the determinants of government expenditure in South Africa.
ii) examine the relative effect of the determinants on government expenditure.

1.4 Hypotheses of the Study

The study hypothesises that:

i)   Poverty, population growth, urbanisation, income, inflation rate, wage rate and trade openness are the determinants of government expenditure in South Africa.

ii) Poverty, population growth, urbanisation, income, wage rate and trade openness have a positive relationship with government expenditure in South Africa.

iii) Inflation rate has a negative relationship with government expenditure in South Africa.

1.5 Organisation of the Study

The rest of the study is organised as follows: Chapter 2 looks at the overview of the government expenditure trends in South Africa. It provides background information on government expenditure and its relationship with its determinants. Chapter 3 reviews the theoretical and empirical literature on government expenditure. Chapter 4 discusses the methodology that will be used to achieve the objective of the study. It specifies the model to be used, the justification of the variables, the expected relationship between the variables and the sources of data. Chapter 5 presents the empirical findings. Chapter 6 concludes the study and provides policy recommendations. The limitations of the study and recommendations for further research are also covered in this concluding chapter.

CHAPTER TWO : GOVERNMENT EXPENDITURE IN SOUTH AFRICA

2.1 Introduction

The purpose of this chapter is to provide an overview of government expenditure in South Africa. The chapter is divided into four sections. Section 2.2 presents some of the government policies and programmes post 1994 aimed at reducing poverty and providing a better life for the citizens. Section 2.3 discusses the nature and trends of government expenditure in South Africa. Finally, Section 2.4 concludes the chapter.

2.2 South Africa's Economic Policies Since 1994

After the democratic elections in 1994, the newly elected government was faced with the challenge of undoing the harm of decades caused by racially based policies. The government was focused on removing discrimination and social injustices caused by the apartheid regime. Since 1994, the government has embarked on broad policy reforms in order to change the society. The government is guided in its expenditure by the policy tools that it has developed since 1994. According to Chetty (2002), macro-economic policies can be used by the government to provide a country with appropriate incentives for economic growth and job creation and also to maximise opportunities for disadvantaged people to participate meaningfully in the economy and in society. The implementation of these macro-economic policies requires resources that may have a bearing on the government expenditure. The policy tools that the government has employed since 1994 are as follows:

- Reconstruction and Development Programme (RDP);
- Growth, Employment and Redistribution (GEAR);
- Accelerated and Shared Growth Initiative for South Africa (AsgiSA);
- New Growth Path (NGP); and
- National Development Plan (NDP).

These tools are discussed in detail in the sections that follow – Sections 2.2.1 to 2.2.5.

2.2.1 Reconstruction and Development Programme (RDP)

After 1994, the objective of the new government has been the creation of a united and democratic society. This led to the development of the Reconstruction and Development Programme (RDP), which was launched in 1994. The aims of the RDP

were to improve service delivery to the poor and remove racial disparities - so as to address poverty and socio-economic inequalities.

The projects that were selected to launch the delivery of the RDP were based on their impact on communities, job creation, community empowerment, provision of basic needs, training and capacity development, transparency, potential to leverage existing funds, and economic and political sustainability (National Treasury, 1995). To meet the objectives of the RDP, an increase in social expenditure of 13% and 15.5% was required for the period between 1994 and 1996 (Chetty, 2002). This led to an amount of R2.5 billion being allocated to the RDP fund in the 1994/95 budget (National Treasury, 1995). The National Treasury (1995) stated that the objectives that were to be achieved by the RDP Fund were:

i)   to give maximum impetus to the redirection of government spending towards new priorities;

ii)   to encourage institutional reform and public sector restructuring;

iii)   to facilitate redeployment of the civil service in line with new priorities;

iv)   to initiate the Presidential Lead Projects and launch longer term programmes;

v)   to assist in directing government spending towards capital expenditure; and

vi)   to change the budget process.

According to the National Treasury (1995), the following projects were implemented under the RDP programme:

i)   The Primary School Nutrition Programme, which reached 8 000 schools and fed over 4.5 million children;

ii)   The rural water supply and sanitation provision project, targeted at 169 villages and 411 000 people; and

iii)   The provision of targeted free health services, which led to several-fold increases in utilisation of public health facilities in many low-income areas.

However, the implementation of the RDP had some pitfalls. According to Kearney and Odusola (2011), the resources and other complementary policy initiatives that were required for the implementation of the RDP were not yet in place when it was launched. The slow performance of the economy also impacted negatively on the RDP, with

achievements falling below expectations (Adelzadeh, 1996). This led to the introduction of Growth, Employment and Redistribution (GEAR) in 1996.

2.2.2 Growth, Employment and Redistribution (GEAR)

This macro-economic policy framework was launched in 1996. The GEAR was the strategy aimed at rebuilding and restructuring the economy. The strategy of this policy was to achieve a growth rate of 6% per year while creating 400 000 jobs per year for the period from 1996 to 2000 (National Treasury, 1996). According to the National Treasury (1996), the key goals of GEAR were as follows:

- Fast-tracking economic growth in order to generate formal employment for work-seekers;
- Redistributing income and generating opportunities for the poor;
- Creating a society in which sound health, education and other services are available to all; and
- Enabling an environment in which homes are secure and places of work are productive.

"The redistributive measures linked to GEAR focused on education as a strategy to promote economic growth and improved income distribution" (Kearney and Odusola, 2011:7). Other, short-term measures included access to free basic health care, accelerated housing development, improved water and sanitation, and land reform (National Treasury, 1996). The 2002 budget began to introduce moderate increases in spending to promote faster growth and poverty alleviation. Government expenditure increases during the GEAR period was contained from 4.6% to 6.2% (Chetty, 2002). However, it failed to bring about increased formal employment and more evenly distributed wealth (Gelb, 2003). The GEAR projections were not realised and the government had to find a new way to accelerate growth and ensure rising living standards for the majority (Kearney & Odusola, 2011). The Accelerated and Shared Growth Initiative for South Africa (AsgiSA) replaced it.

2.2.3 Accelerated and Shared Growth Initiative for South Africa (AsgiSA)

The policy framework AsgiSA replaced GEAR and it was launched in 2006. According to the Presidency (2006), AsgiSA was established to enable the government to halve

unemployment and poverty by 2014. In particular, infrastructure development such as the upgrading and building of the energy infrastructure, railways and ports and the road network were included to enable AsgiSA to achieve its objectives. An amount of R410 billion was set aside for these capital expenditure programmes between 2007 and 2010, 40% of which would be spent by public enterprises. Eskom was expected to spend R84 billion on generation, transmission and distribution programmes and Transnet projected a cost of R47 billion for ports, railways and the petroleum pipeline expenditure. The Airports Company of South Africa (ACSA) was to spend R5.2 billion, including airport improvement and the Dube Trade Port; with a further R19.7 billion allocated to water infrastructure. The balance of the R410 billion was to be used for the upgrading and building of stadia in preparation for the 2010 Soccer World Cup and other smaller infrastructure projects (Hanival & Maia, 2008).

In the AsgiSA, six binding constraints were identified (The Presidency, 2006). They are listed as follows:

i)   Volatility and the level of currency;

ii)   The cost, efficiency and capacity of the national logistics system;

iii)   Shortage of suitably skilled labour amplified by the impact of apartheid spatial patterns on the cost of labour;

iv)   Barriers to entry, limits to competition and limited new investment opportunities; and

v)   Regulatory environment and the burden on small and medium business.

According to The Presidency (2006), in response to the binding constraints, the government identified six categories of initiatives that were to address the binding constraints in achieving AsgiSA objectives as follows:

i)   Infrastructure programmes;

ii)   Sector investment (or industrial) strategies;

iii)   Skills and education initiatives;

iv)   Second economy interventions;

v)   Macro-economic issues such as the volatility of the exchange rate; and

vi)   Public administration issues such as improved service delivery.

According to Kearney and Odusola (2011:8), "the driving rationale behind AsgiSA was an understanding that although the country had made substantial economic achievements since the transition to democracy in 1994, distribution outcomes were skewed towards a few at the expense of the majority".

2.2.4 New Growth Path (NGP)

The Presidency (2010:6) stated that there is a growing consensus that creating decent work, reducing inequality and defeating poverty can only happen through a new growth path founded on the restructuring of the South African economy to improve its performance in terms of labour absorption as well as the composition and rate of growth. This led to the introduction of the New Growth Path (NGP) in 2010. According to The Presidency (2010), the objectives of the NGP were to grow employment by 5 million by 2020 and reduce narrow unemployment by 10%, largely through a public infrastructure programme. This policy path aims to enhance growth, employment creation and equity.

Urbanisation is an issue in South Africa, with many people moving to urban areas for better opportunities. The NGP plans were to control urbanisation by providing public infrastructure and housing in rural areas, with the aim of lowering the costs of economic activity and to foster sustainable communities (The Presidency, 2010). In addition, the government had realised that rural development programmes can achieve a measurable improvement in livelihoods for 500 000 households, as well as stimulating employment in other sectors of the economy (The Presidency, 2010). To achieve these objectives, it required the government's involvement by investing resources in infrastructure programme, as stated by the Presidency (2010:34) that the "expansion of public employment will require proper budgeting and a strategy to ensure both affordability and cost effectiveness".

2.2.5 National Development Plan (NDP)

The National Development Plan (NDP) is the government plan to eliminate poverty and reduce inequality by 2030 (The Presidency, 2012). The NDP has made a commitment to achieve a minimum standard of living for the South Africans through the elimination of poverty and reduction of inequality. According to The Presidency (2012:28), the elements of a decent standard of living identified in the NDP are

housing, water, electricity and sanitation; transport; education and skills; safety and security; health care; employment; recreation and leisure; clean environment and nutrition.

To meet the objectives of the NDP, the structure of the economy and the growth rate will have to change. The rate of economic growth required to transform the economy and create jobs need to exceed 5% a year on average (The Presidency, 2012). In order to meet this objective the government plans to do the following (The Presidency, 2012:28):

i. Increase exports in sectors where the country has comparative advantage, such as mining, construction, mid-skill manufacturing, agriculture and agro-processing, higher education, tourism and business services;

ii. Address inequality and poverty by increasing income through productivity growth and reducing the cost of living;

iii. Reduced cost of regulatory compliance, especially for small- and medium-sized firms;

iv. A larger, more effective innovation system closely aligned with firms that operate in sectors consistent with the growth strategy;

v. Support for small business by providing finances;

vi. An expanded skills base through better education and vocational training;

vii. Strengthened financial services to bring down their cost and improve access for small- and medium-sized businesses;

viii. A commitment to public and private procurement approaches that stimulate domestic industry and job creation;

ix. A higher rate of investment, with public sector investment crowding in private investment;

x. A labour market that is more responsive to economic opportunity; and

xi. Enhanced commercial diplomatic services to support the expansion of South Africa's global market share.

The NDP will require the government to shift the budget to sectors that will develop the economy and create jobs. According to The Presidency (2012), the NDP will change the government budget allocation over the next 17 years.

2.3 The Nature of Government Expenditure in South Africa: 1970-2014

Government spend money for mainly two functions, which are to produce and pay for goods and services; and redistribute income (The Organisation for Economic Co-operation and Development (OECD), 2013). Government spending falls under fiscal policy. Fiscal policy is defined as a policy that deals with the level and composition of government spending, taxation and borrowing (Mohr, 2015). The budget is the main instrument and government spending and taxation are the policy tools of the fiscal policy. According to the National Treasury (1999), government's fiscal policy seeks to:

i) Ensure a sound and sustainable balance between government's spending, tax and borrowing requirements;

ii) Improve domestic savings to support a higher level of investment and reduce the need to borrow abroad;

iii) Allocate public spending effectively and efficiently to meet government's growth, redistribution and social development goals;

iv) Encourage an improved trade performance and a healthy flow of capital on the balance of payments; and

v) Manage government employment, payment and procurement to ensure efficient delivery of services within an affordable expenditure plan.

Government expenditure consists of economic and functional classification in South Africa. Economic classification of expenditure is a measure of the nature and economic effect of government operations on the economy of the country; and functional classification of expenditure measures the allocation of resources by government in order to promote government objectives and various services rendered to the community (Statistics South Africa, 2004).

In South Africa, spending and budgeting occur within a Medium-Term Expenditure Framework (MTEF), which projects income and expenditure for three years. According to Robinson (2002), the MTEF that was launched in 1998 aimed to strengthen the link between government's policy choices on the budget and the delivery of services, which serves to strengthen political decision making and accountability. The benefits of the MTEF have been stated in the National Treasury's (1998) budget review as follows:

i) Allocation of resources to priority services;

ii)   More efficient planning and management;

iii)   A framework within which policy proposals can be assessed;

iv)   More transparency in government;

v)   A reduction in roll-overs; and

vi)   A clear demonstration of how fiscal targets will be met.

The Minister of Finance presents the budget annually to the Parliament in the month February. The Minister provides frameworks for the spending plans for the current financial year, which is from 1 April to 31 March of the year that follows. In the budget, the Minister will also outline how the government plans to finance its spending. The trends of government expenditure in South Africa are discussed in detail in the sections that follow – Sections 2.3.1 to 2.3.3.

2.3.1 Trends in Government Expenditure in South Africa

The size and distribution of the government expenditure has changed since the end of apartheid. The people who were excluded to basic services pre-1994 have access to education, water, electricity, health care, housing and social security (The Presidency, 2012). The priorities of government, guided by the MTSF, include education, health, rural development, fighting crime and creating jobs, among others. While the bulk of resources are allocated to these functions, a significant share of additional spending goes to fund higher-than-budgeted salary increases and occupation-specific dispensations for certain professionals (National Treasury, 2010). According to Menyah and Wolde-Rufael (2012), the share of government expenditure in GDP in South Africa has increased in absolute and in relative terms over the years. Figure 2.1 shows the trend in government expenditure as a percentage of GDP from 1970 to 2014.

Figure 2.1: Government Expenditure as a Percentage of GDP: 1970-2014
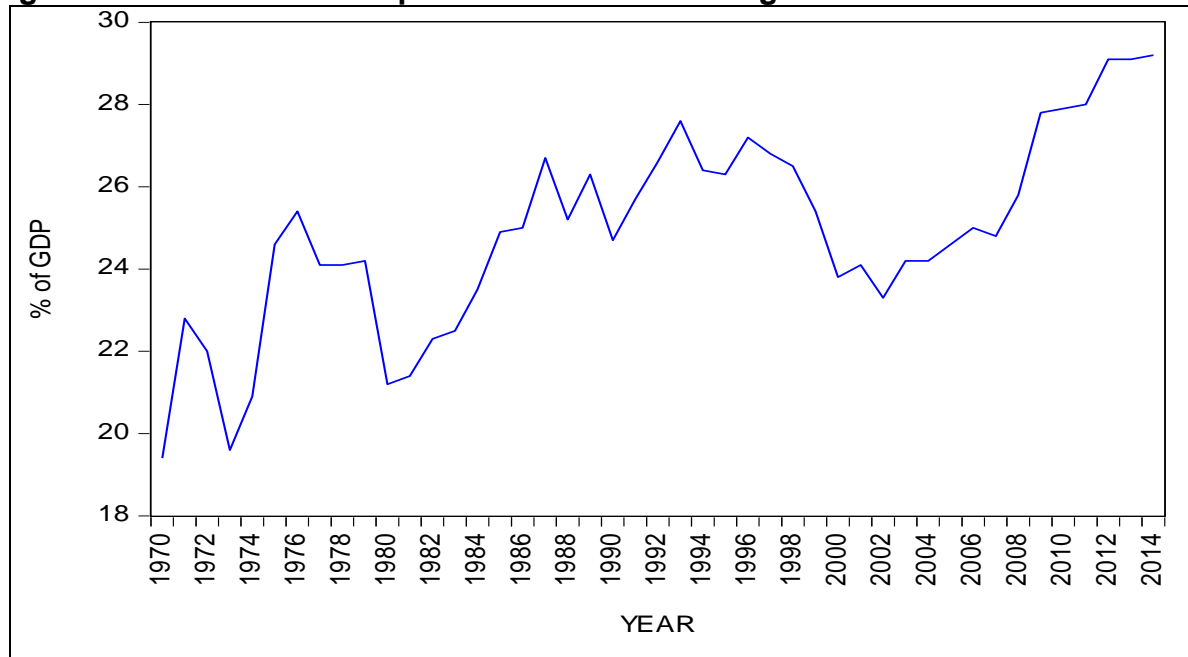
Source: Own Compilation from SARB (2015)

As shown in Figure 2.1, government expenditure as a percentage of GDP has increased from 19.4% in 1970 to 29.2% in 2014 (see Figure 2.1). During the pre-1994 period, government expenditure was low compared to post-1994. Figure 2.1 further reveals that government expenditure as a percentage of GDP increased from 26.4% in 1994 to 29.2% in 2014. In 1970, the government expenditure as a percentage of GDP was 19.4%. This has been the lowest government expenditure as a percentage of GDP since 1970. For the period of 1977 to 1979, the government expenditure as a percentage of GDP was kept at 24% before it decreased to 21% between 1980 and 1981. It has continued to increase since 2008, and it has been maintained at 29% since 2012. Figure 2.2 shows the trends in government expenditure and government revenue as a percentage of GDP.

Figure 2.2: Government Expenditure and Revenue: 1970-2014
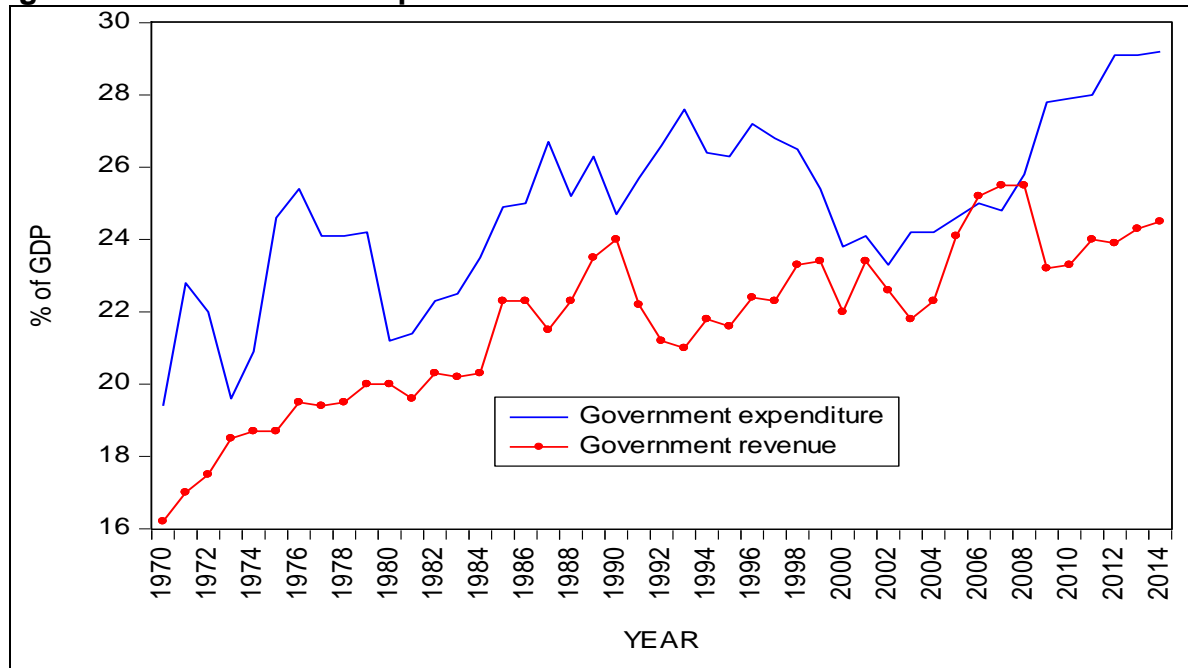
Source: Own compilation from SARB (2015)

The government expenditure has been exceeding the government revenue except in 2006 and 2007 when the government for the first time since 1970 recorded a budget surplus. Current deficit means that the country has been borrowing to finance spending on recurrent costs such as compensation of employees and good and services (National Treasury, 2012). Since the 1970s, the government has recorded a high percentage of revenue to GDP of 25% for the period between 2006 and 2008. From 1970, the government was running sizeable deficits before they decreased in 1973. In 1991, the deficit started to increase again before it started to stabilise in 1999 leading to the first recorded surplus in 2006 (see Figure 2.2). The budget between 1994 and 1995 also focused on reducing the deficit (National Treasury, 1996). This was only maintained until 2007. In 2008, the country started to experience a current deficit again (see Figure 2.2). One of the causes for the continuous government deficits has been the expansion of government expenditure. According to Tshiswaka-Kashalala (2006), since the 1990s, South Africa has adopted two important public finance management tools to ensure that current budget deficits are in accordance with the two-fold objective of sustainable fiscal policy and economic growth – the GEAR strategy in 1996 and the MTEF in 1997.

In terms of the World Bank (2012) classification, South Africa is an upper middle-income country. As an upper middle-income, the composition of government expenditure gives priority to education, health and the development of social security system (World Bank, 2012). Since the end of apartheid, government spending has been on a continuous increase and the major increase has been recorded under social services – which include health, education, social security and housing. Although there has been an increase in government spending, the rising budget allocations have not been matched by a commensurate improvement in service-delivery outcomes (National Treasury, 2012). The final consumption expenditure by general government over the years from 1970 to 2014 in real terms are presented in Figure 2.3

Figure 2.3: Final Consumption Expenditure by General Government: 1970-2014
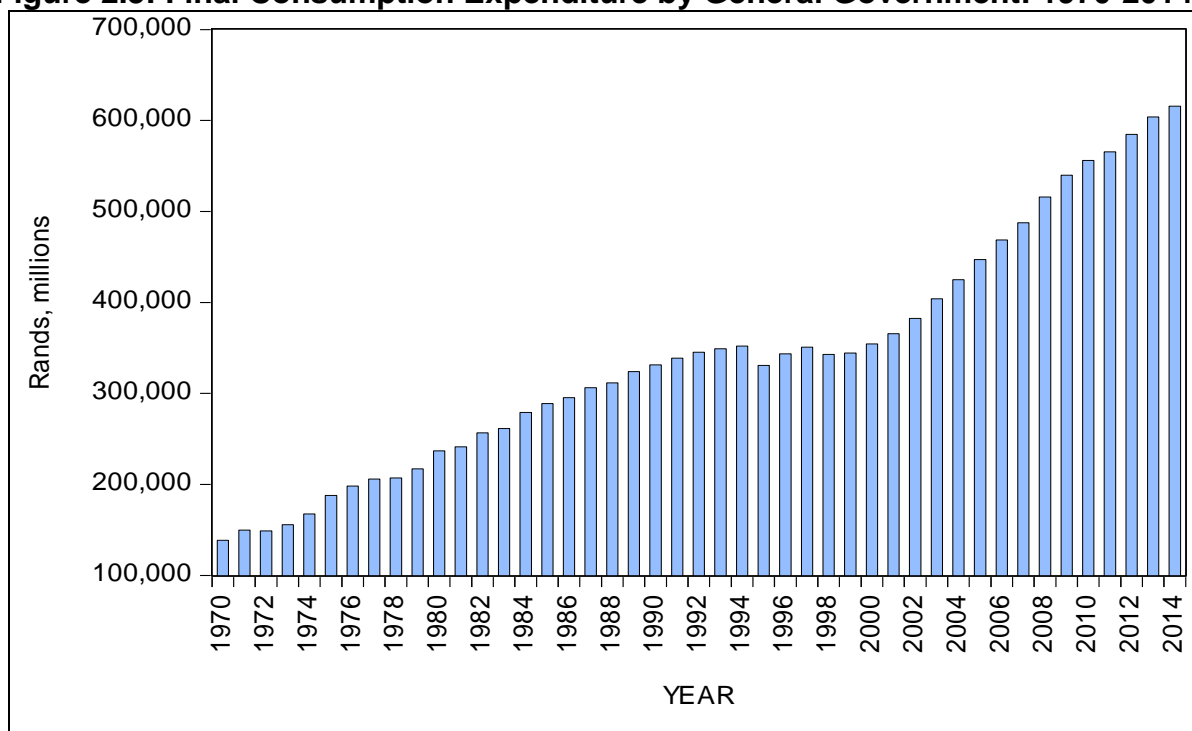
Source: Own compilation from SARB (2015)

Figure 2.3 shows that government consumption expenditure has increased from R138653 million in 1970 to R625025 million in 2014. However, consumption expenditure was low pre-1994, averaging R247591 million between 1970 and 1993. This could be the results of the apartheid regime whose consumption expenditure excluded the majority of South Africans and mostly benefited the minority. The country has a history of racial discrimination that has left the country with the legacy of inequality and poverty (Mubangizi & Mubangizi, 2005). Consumption expenditure

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substantially increased between 1994 and 2014, averaging R448205 million per year since post-1994. As portrayed in Figure 2.3, from 1994, spending rose from R351961 million to R625025 million in 2014. According to National Treasury (2000), the reason for the sharp increase on consumption expenditure during this period was because of government's primary objective of achieving a marked redistribution of spending in favour of previously disadvantaged communities using a sound fiscal policy framework that eliminates unsustainable deficit spending and increasing public debt.

According to the National Treasury (1995), some of the more important determinants of the composition of general government expenditure since 1982 include the following:

    i)   The drive to expand access to and the quality of social services;

    ii)   The equalisation of social grants;

    iii)   Agricultural and climatic conditions;

    iv)   The shift towards a more outward-oriented economic growth strategy;

    v)   The changing external and internal security situation;

    vi)   The growth of the public debt since the late 1980s, including stock issues in respect of formerly unfinanced liabilities;

    vii)   The impact of higher interest rates on state debt costs;

    viii) Efforts to make government pay structures more equitable; and

    ix)   Aspects of the structure of the government sector in South Africa and the financial relations between tiers of government and between government authorities and other public sector agencies.

2.3.2 Trends in Functional Composition of General Government Expenditure: 1982/83 to 2011/12

Functional composition comprises general services, protection services, social services and economic services. Government spending has continued to rise due to an increase demand for public goods such as health, electricity and education. Expenditure on education, health services, social pensions and police has continued to increase and has exceeded population growth in real terms since 1982/83, while per capita real expenditure on defence has fallen (National Treasury, 1994). This is partly driven by demographic and social trends, and cannot easily be adjusted downwards when revenue performance weakens under recessionary conditions

(National Treasury, 1994). Table 2.1 shows the functional composition as a percentage of total government expenditure.

Table 2.1: Functional Composition as a Percentage of Total Government Expenditure

	1982/83	1991/92	2000/01	2011/12
General services and unallocated expenditure	11.2	12.6	7.1	15
Protection services	22.6	21.9	16.7	13.4
Social services	44.4	50	47.9	59.4
Economic services	21.8	15.5	9.3	12

Source: Own Compilation from National Treasury Budget Review (various issues)

It is shown in Table 2.1 that social services have a large share of the functional classification of government expenditure. For the period 1983 to 2012, the government expenditure on social services was the highest, followed by protection services then economic services, with the last being general services. The portion of general government expenditure allocated to this activity increased from 44.4% in 1982/83 to 50% in 1991/92 and in 2000/01 period it decreased to 47.9% comprising of 20.9% towards education. In 2011/12 spending on social services increased from 47.9% in 2000/01 to 59.4% with spending in education slightly increasing to 21.3% and social protection increasing from 12.1% to 15.4%. The functions that have benefited most from the growth of the social services are pre-tertiary education and social security and welfare services (National Treasury, 1995).

Spending on protection services, which includes defence, police, prisons and courts, was high in the 1980s; but after 1994, it has been on a decline reflecting the changed priorities of the post-apartheid government. It can be seen that spending on protection services now makes up a small percentage of government spending with only 13.4% in 2012 (see Table 2.1). There has been an increasing trend of general current spending as more resources are being shifted to the purchase of goods and services and the expansion of social welfare. As shown in Figure 2.4, during pre-1994, expenditure on education and defence were always the biggest functional group in

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consumption expenditure. Education has continued to comprise the majority of consumption expenditure while defence expenditure has fallen post-1994 (see Figure 2.4). Since 1994, education spending trends have continued to increase, leading to improved funding of basic and higher education. The trend in government expenditure on selected functional spending in South Africa is shown in Figure 2.4.

Figure 2.4: Selected Functional Spending in South Africa: 1983-2012
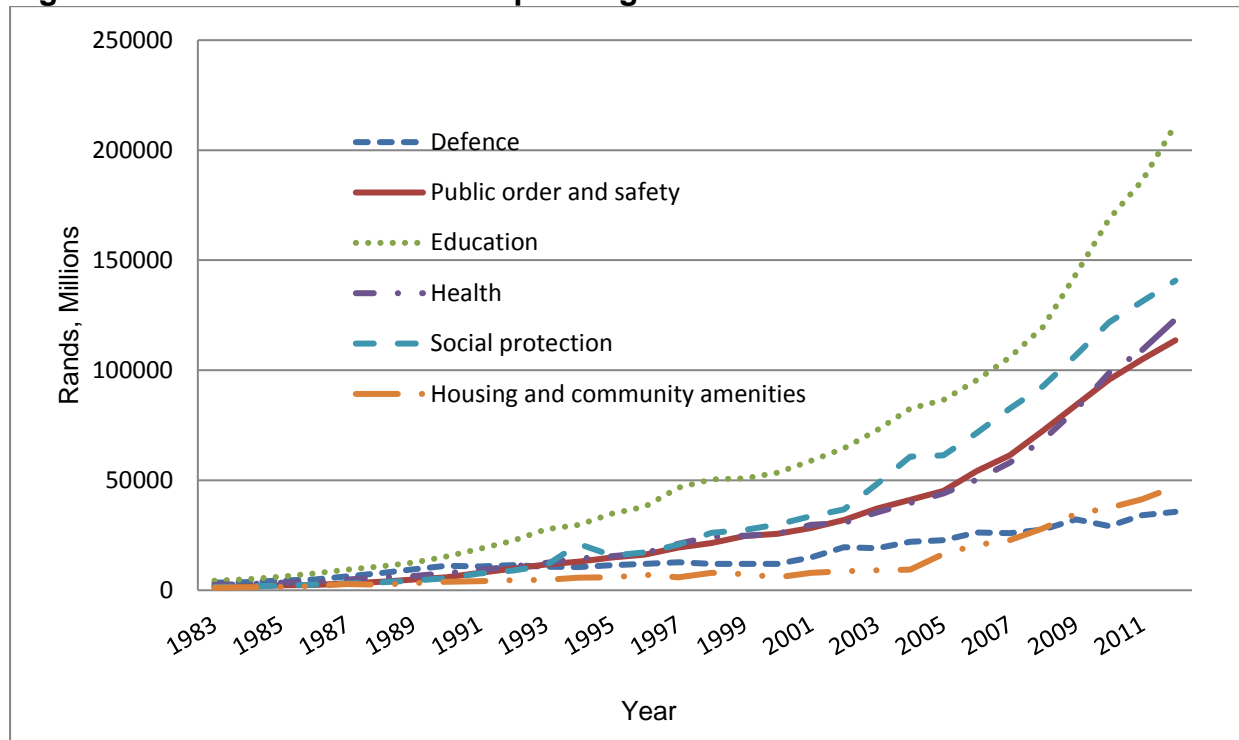
Source: Own compilation from SARB (2014)

During the pre-1994 period, expenditure on education was the highest and defence expenditure was the second highest of the functional spending. From the 1990s, spending on social protection started to take over as the second highest of the functional spending. According to National Treasury (1994), the increase in social security and welfare spending was due to the government's aim to eliminate the racial disparities in social grants. From Figure 2.4, it can been seen that housing and community services has been paid little attention as it has the lowest component of functional spending from 1983 to 2007. In 2008, it was higher than the defence expenditure when it was R27.5 billion and spending on housing was R28.1 billion.

The government requires a higher level of sustainable economic growth that generates adequate tax revenue to be able to pay for its social programmes (National Treasury, 2012). The country had a strong economic growth from 2000 to 2007 averaging 5% between 2004 and 2006, just before the global crisis in 2009 (World Bank, 2015). This enabled the government to continue increasing its public spending. Since 1994, the government has shifted the expenditure; and it is now focusing more on social services, which include health services, social welfare, education, housing and safety. The spending on these functional areas such as education, health care and social protection continue to account for the largest share of government expenditure and growing in average real terms by 1%, 1.5% and 3% respectively (National Treasury, 2012). Some of the social services that have been on the continuous increase during the post-1994 are discussed in sections 2.3.2.1 to 2.3.2.3.

2.3.2.1   Education

Since 1994, there has been an increase in education expenditure from R31.8 billion in 1994 to R69.1 billion in 2003, accounting for 6% of GDP (Frank, 2006). This shows that South Africa has a comparatively high rate of government investment in education (National Treasury, 2004). Education has always had a larger share of the government expenditure. Figure 2.5 illustrates government spending on education from 1983 to 2012.

Figure 2.5: Spending on Education: 1983-2012
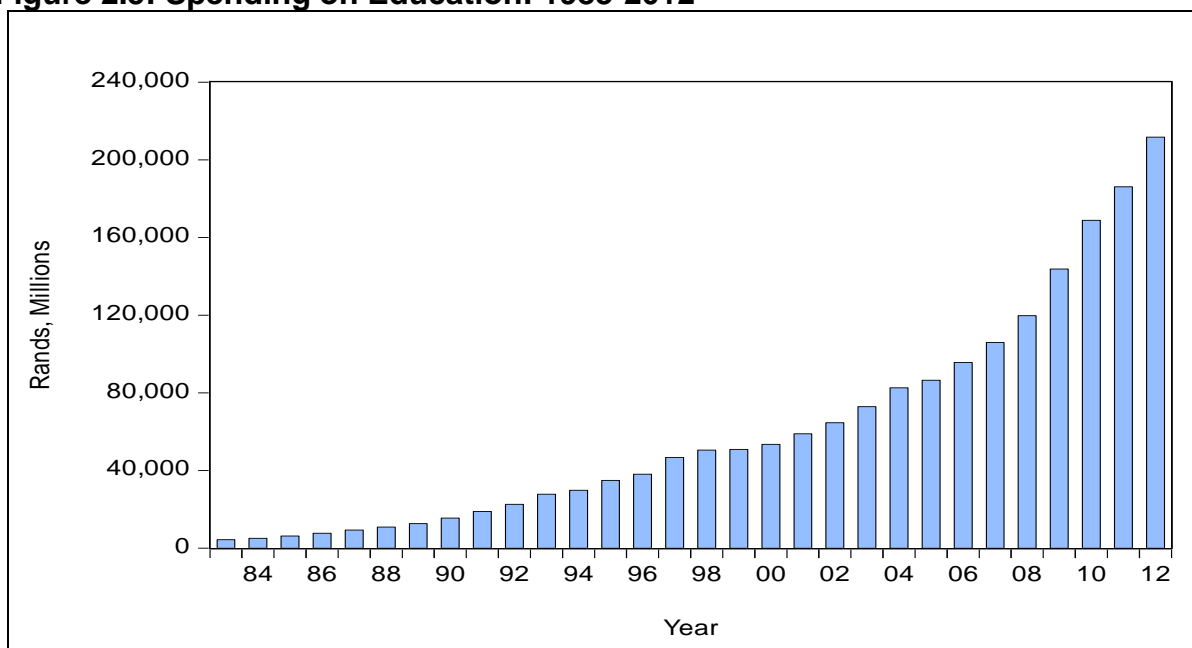
Figure 2.5 shows that spending on education has increased in the post-1994 era, compared to 1983, when the government spent R4.3 billion on education. By 1994, it had spent R29.8 billion, and by 2012, it was R211.6 billion. In Figure 2.5, it is revealed that government spending on education was low during pre-1994. The spending during this period ranged between R4.3 billion to R29.7 billion. In the period post-1994, which was the end of apartheid, the government spending on education from 1995 to 2012 ranged between R34.8 billion to R211.6 billion.

In 2010, 17% of the government expenditure was directed towards education (National Treasury, 2010). The inequality in education led to an increase in overall real spending in education after 1994 benefiting the black population (Van der Berg & Moses, 2012). Over the past years, the government has continued to increase its efforts to improve the state of education in South Africa. (National Treasury, 2015).

2.3.2.2   Health

Government has the responsibility to provide health services to its citizens. According to National Treasury (1998), all citizens have the right of access to public primary health-care services and they are provided free of charge; although there is a charge for prescribed medicines for those who can afford to pay. "Government believes that improved quality and access to primary health care is the most effective and cost-efficient approach to addressing the health needs of all South Africans" (National Treasury, 1998). With many people in the country living with HIV and below the poverty line, public health services play a very important role. Figure 2.6 illustrates the government spending on health from 1983 to 2012.

Figure 2.6: Spending on Health: 1983-2012
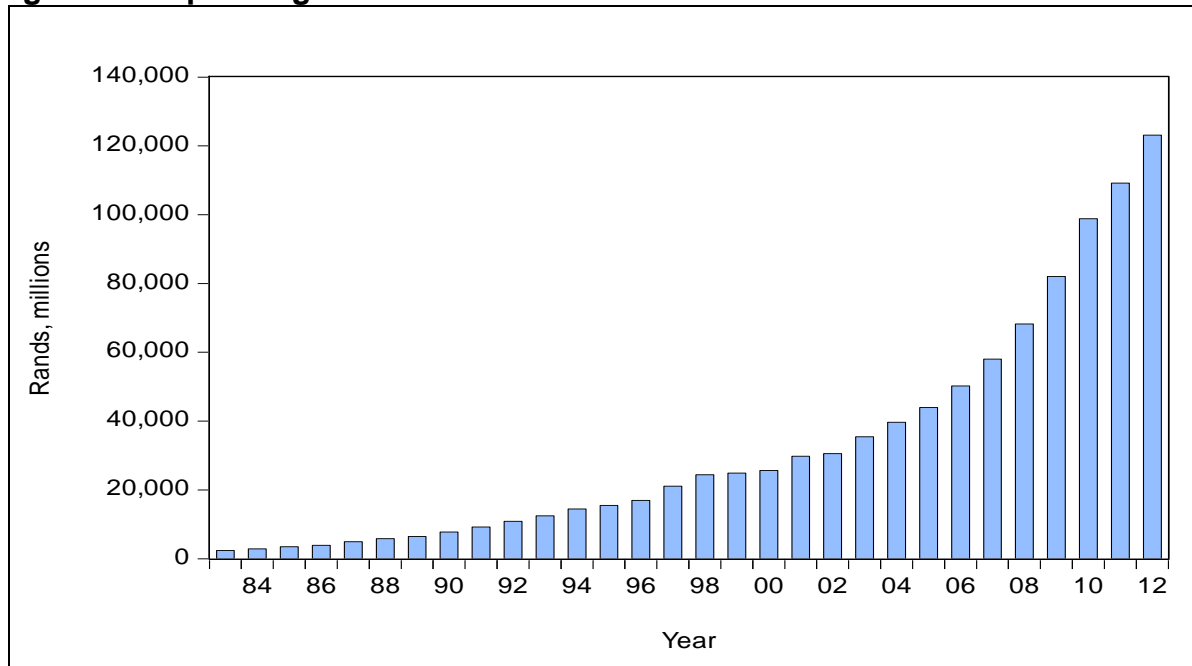
Source: Own compilation from SARB (2014)

The government expenditure on health has been on the continuous increase from 1983 to 2012. In 1983, the government spent R2.3 billion compared to R123.1 billion in 2012. The spending on health during 1983 to 1994, ranged between R2.3 billion to R14.4 billion. In the period post-1994, the government spending on health from 1995 to 2012 ranged between R15.5 billion to R123.1 billion.

Between 1992 and 1997 there was a significant increase in overspending; this was due to a rising remuneration following the 1996 wage agreement (National Treasury, 2004). The public health services cater for the majority of the country population and are delivered primarily by the provincial governments. National Treasury (2004) states that real funding levels for provincial departments of health grew by R1.7 billion in 2004/05 and by nearly R4 billion from 2003/04 to 2006/07. Although there is an increase in health spending, public health services still faces a number of challenges. One some of the challenges is that there is a continuous growth of dependents on the government due to population growth. According to Peacock and Wiseman (1961), population changes have an influence on government spending and on the services associated with the relief of distress.

2.3.2.3 Social Protection

Social protection is the second largest recipient of government expenditure after education (see Figure 2.4). Social assistance grants are non-contributory, income-tested benefits provided by the government to the poor (Leibbrandt *et al.*, 2010). They are provided in the form of: state old age grant, disability grant, war veterans' grants, care dependency grant, foster care grant and child support grant (CSG). Table 2.2 shows the types of grants.

Table 2.2: Types of Grants: 2012

Grant Type	Amount
Care Dependency	R1200
Child Support	R280
Foster Care	R770
Disability	R1200
Old Age	R1200
War Veterans	R1220

Source: Own compilation from National Treasury (2012)

Social spending is the main instrument of targeting resources to the poor population in the country (Van der Berg & Moses, 2012). Government spending on social assistance has been on a continuous increase since 1994. In 2012, there were a total of at least 15 million beneficiaries receiving the grant with 70% being the number of CSG beneficiaries (South Africa Social Security Agency (SASSA), 2013). Figure 2.7 shows the average number of grants beneficiaries per province in 2012.

Figure 2.7: Average Number of Grants Beneficiaries per Province: 2012
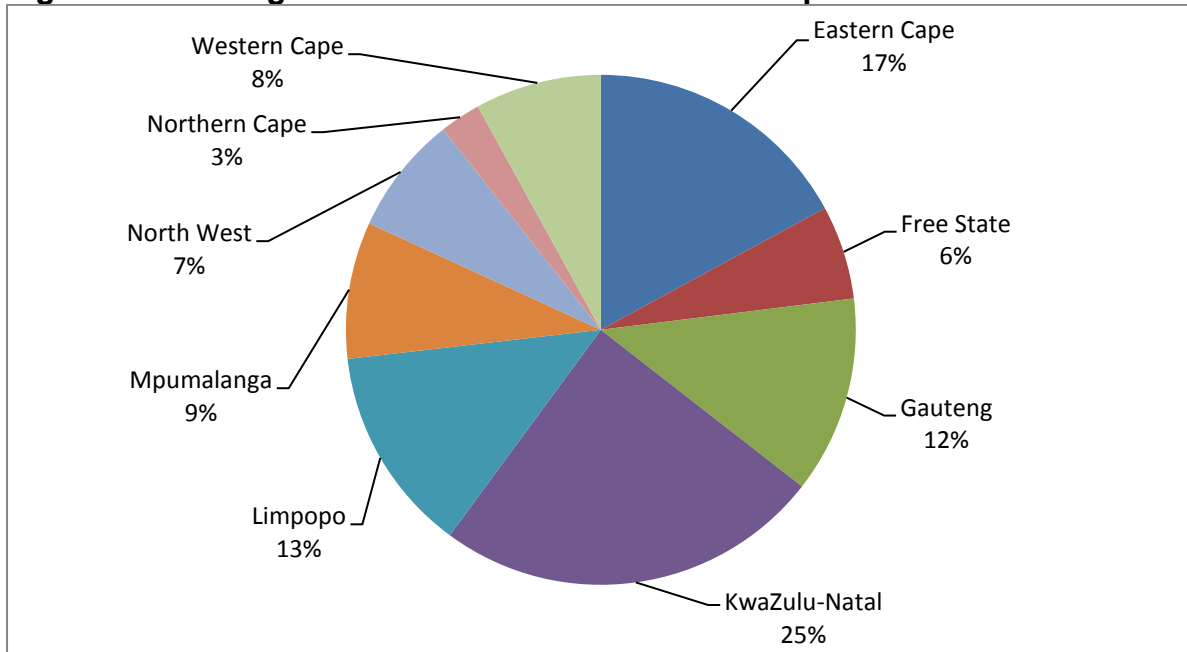
Source: Own compilation from SASSA (2012)

Figure 2.8 shows that Northern Cape Province has the smallest share of the total number of grants beneficiaries. Kwazulu-Natal has the highest share as at year 2012 accounting 25% followed by the Eastern Cape with over 17%. The CSG was introduced in 1998 to replace the state maintenance grant. The CSG has the largest share of the number of beneficiaries. The social assistance programme is government's most direct means of combating poverty (National Treasury, 2012). According to Van der Berg and Moses (2012), between 2000/01 and 2006/07, the real payments for CSG more than doubled and the additional spending was in the form of assistance to households with children and changing the eligible age for the CSG to 14. Figure 2.8 shows the average number of beneficiaries per grant in 2012.

Figure 2.8: Average Number of Beneficiaries per Grant Type: 2012

Number of Beneficiaries per Grant Type

Legend:
- Care Dependency
- Child Support
- Foster Children
- Grant-in-Aid
- Old Age
- Disability
- War Veteran
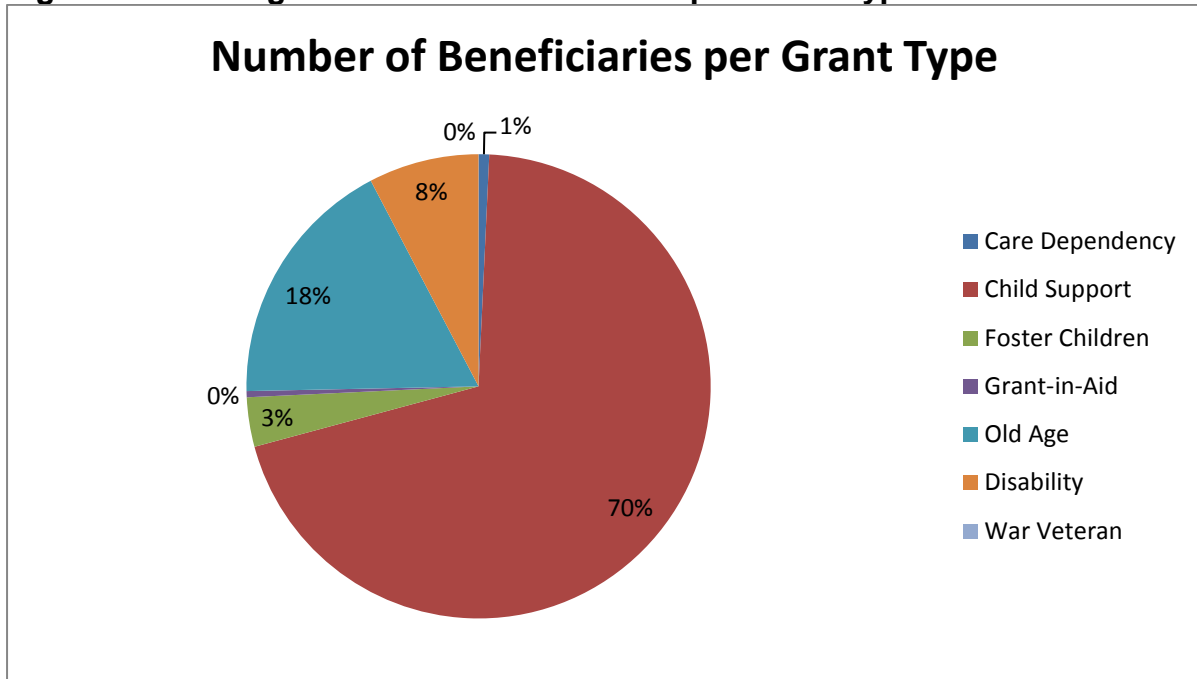
Source: Own compilation from SASSA (2012)

As shown in Figure 2.9, CSG accounted 70% of the beneficiaries while an old-age beneficiary were 18%. The CSG was paying R280 per beneficiary in 2012. It can be seen by the number of beneficiaries depended on the grants that they are an important source of income for the majority of poor households in South Africa (Mubangizi & Mubangizi, 2005). This investment ensures a better quality of life than any would have experienced without access to a grant, including the access to basic health services and education (Bhorat and Cassim, 2014). According to Nation Treasury (2012), the expenditure on social grants was expected to increase from R105 billion in 2012/12 to R122 billion in 2014/15 budget and nearly 16 million beneficiaries receiving the grant. Figure 2.9 illustrates the government spending on social protection from 1983 to 2012.

Figure 2.9: Spending on Social Protection: 1983-2012
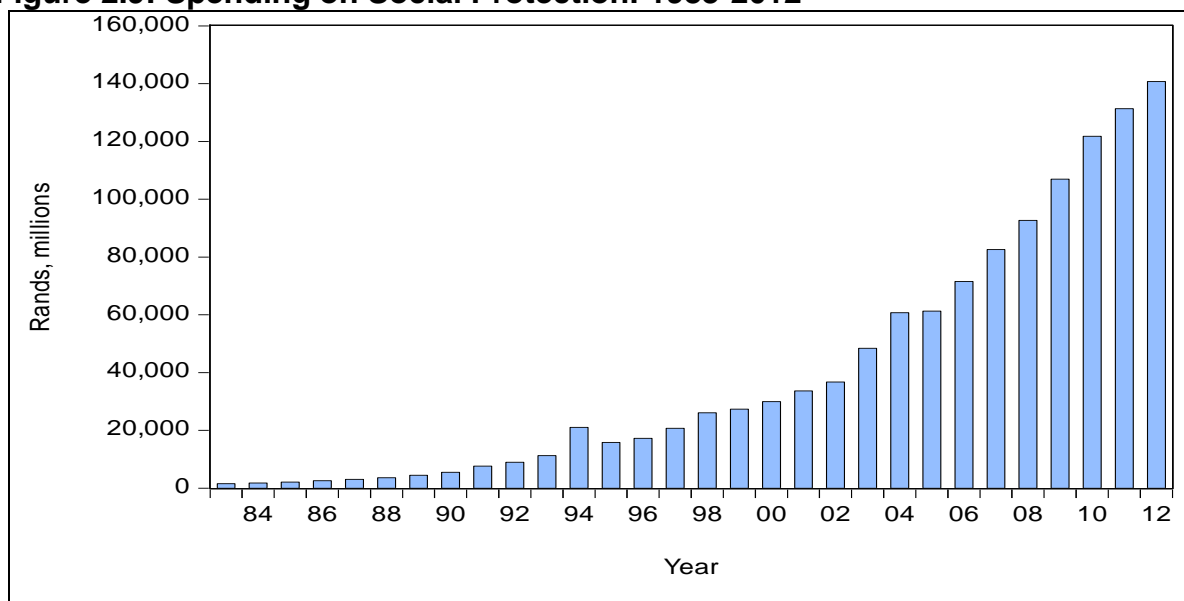
Source: Own compilation from SARB (2014)

Spending on social protection has continued to increase from 1983 to 1994. In 1994, the spending was a double of the spending in 1993. It has increased from R11.2 billion in 1993 to R21 billion in 1994. In 1995 there was a decrease in spending on social protection to R15.7 billion. Since the sharp decrease in 1995, it has continued to be on the increase since 1996. The spending during the pre-1994, the spending was low and ranged between R1.5 billion to R11.2 billion before it doubled in 1994.

2.3.3 Trends of Economic Composition of General Government Expenditure: 1982/83 to 2011/12

Economic composition comprises goods and services, interest on public debt, subsidies and current transfers, as well as total capital expenditure. The corresponding increase in the share of current expenditure can be attributed to the growth of spending on goods and services (mainly remuneration of employees), interest on public debt and some components of subsidies and transfers (National Treasury, 1995). In 1991/92 capital expenditure comprised 8.9% of total general government expenditure, having declined from 17.4% in 1982/83. Capital spending recovered between 1992/93 and 1994/95, but remained markedly lower than in the first half of the 1980s. In 1982/83 total spending on capital expenditure was 17.4% and this continued to decrease to 4.5% in 2011/12. Table 2.3 shows the trends of economic composition as

a percentage of general government expenditure for the period between 1982/83 to 2011/12.

Table 2.3: Economic Composition as a Percentage of Total Government Expenditure

	1982/83	1991/92	2000/01	2011/12
Goods and services	52.7	62.3	51.0	47.4
Interest on public debt	12.9	14.5	19.0	8.3
Subsidies and current transfers	12.6	14.3	24.7	39.8
Total capital expenditure	17.4	8.9	5.3	4.5

Source: Own compilation, National Treasury Budget Review, (various issues)

Goods and services entail remuneration of employees and other services. In 1991/92, 40.5% of goods and services was spent on compensation of employees. The compensation of government employees has been on a continuous increase as it is reflected in Figure 2.7. According to budget review (National Treasury, 1995), it reflects both increased government employment and improved salaries and wages, and is related to the growth of expenditure on social and police services, which are functions in which the share of remuneration of employees in total expenditure is typically over 60%.

Figure 2.10 shows that government spending on compensation of employees increased from R50 465 million in 1983 to R1451 603 million in 2012. In addition, R2.807 billion was allocated for improvement of conditions of service for the 1994/95 financial year (National Treasury, 1994). As personnel expenditure represents some 40% of state expenditure, any attempt to control government expenditure must also focus on restraint in the wage bill and also in employment and remuneration and although it has been on an increase, the average salary adjustment has been kept below the inflation rate (National Treasury, 1994). Figure 2.10 presents the trends in compensation of employees.

Figure 2.7: Compensation of Employees: 1983-2012
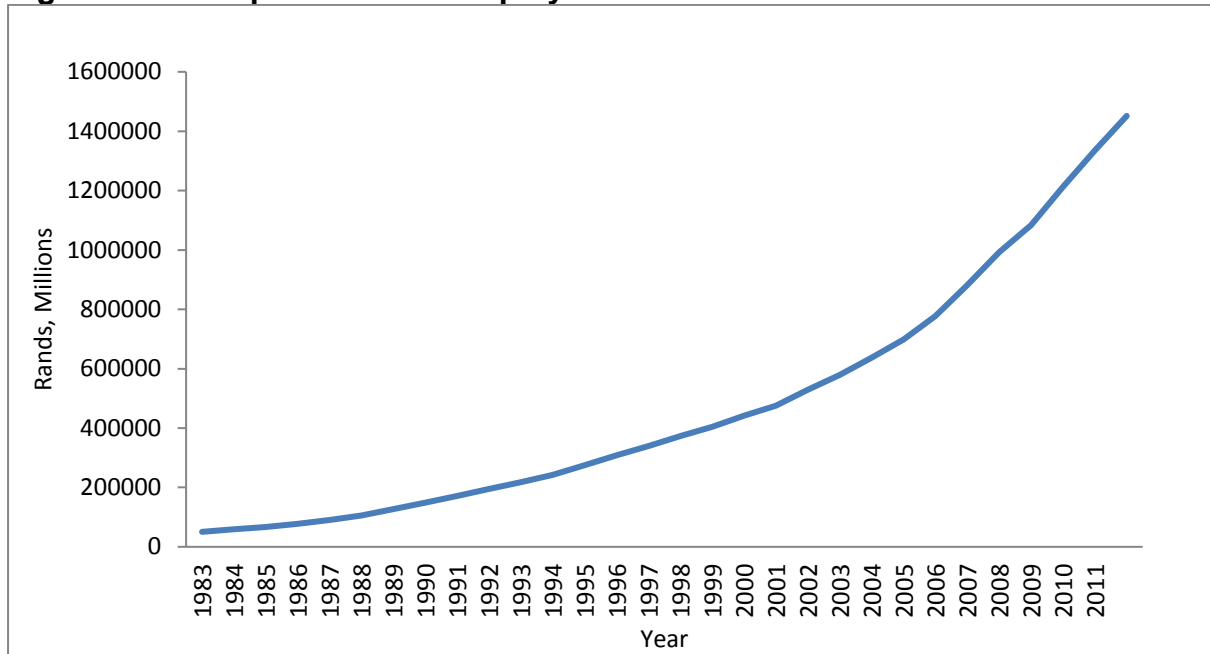
Source: Own compilation from SARB (2014)

The continuous increase in the compensation of employees since 1994 has been the results of an increase in staff in priority areas such as health care and policing; real wage increases for specific categories of professionals; improved employee benefits such as the Government Employees Medical Scheme; and several years of across-the-board salary increases above the rate of inflation (National Treasury, 2012). Although the improvements in the government employees benefits were necessary, it resulted in fewer resources to be made available for social and economic infrastructure as compensation of employees grew from 35.7% of non-interest spending in 2008/09 to 38.7% in 2011/12 (National Treasury, 2012).

Interest on the public debt increased from 12.9% in 1982/83 to 14.5% in 1991/1992 and this was due to higher interest rates (see Table 2.3). During the 1989 to 1993 recession, the continuous government spending increase, together with a slower revenue growth impacted on the annual government borrowing requirement and this led to an increase of the public debt and associated increased interest costs (National Treasury, 1995. In 2000/01, interest on public debt was 19% before it decreased to 8.3% in 2011/12 due to lower interest rates.

Subsidies and current transfers have been on an increase since 1982/03 (see Table 2.3). In 1982/03, it was 12.6% and it increased to just over 14.3% with a growth of 1.43%. In 2011/12, it was 39.8% and it has increased by 27.2 percentage points from 12.6% in 1982/83 (see Table 2.3). This is due to an increase in government subsidies to business enterprises and transfers to universities and technikons. The government also funds the National Student Financial Aid Scheme (NSFAS) for bursaries and loans to students who cannot afford post-school education fees.

2.4 Conclusion

The chapter provided an overview of government expenditure in South Africa for the period 1970 to 2014. There has been a rapid growth in government expenditure since the end of apartheid. Expenditure is higher in the post-1994 era than during the apartheid period. A reason for massive expenditures post-1994 includes the spending on social services, which includes health, education, social security and housing. The rapid growth in social assistance spending shows the government's commitment to alleviating poverty and its ability to implement increased levels of services. It is found that government expenditure as a percentage of GDP significantly increased from 19.4% in 1970 to 29.2% in 2014.

The chapter also discussed the post-apartheid policies and programmes that were meant to assist the government with its objectives of alleviating poverty and creating employment. These policies include RDP, GEAR, AsgiSA, NGP and NDP. They have somewhat assisted the government with its objectives of alleviating poverty and creating employment. The government spending is guided by the objectives set out in these policies and programmes.

CHAPTER THREE : THEORETICAL AND EMPIRICAL LITERATURE REVIEW

3.1 Introduction

This chapter discusses both the theoretical and the empirical literature on government expenditure and its determinants. The chapter is divided into three sections. Section 3.2 reviews the theoretical literature on government spending. In Section 3.3, the empirical evidence on the relationship between government expenditure and its determinants is presented. Finally, Section 3.4 presents the concluding remarks.

3.2 Theoretical Literature Review

This section discusses the theoretical framework that underpins the determinants of government expenditure. The theories discussed are the Wagner's Law of increasing state activity, discussed in Section 3.2.1; the Keynesian theory of public expenditure, discussed in Section 3.2.2; Peacock and Wiseman theory of public expenditure in Section 3.2.3; and Musgrave and Rostow's theory of public expenditure in Section 3.2.4.

3.2.1 Wagner's Law

The Wagner's Law states that as the economy grows, the government functions and activities also increase (Wagner, 1893). The law indicates that the government embarks on new activities in the interest of the citizens and its purpose is to meet the economic needs of the citizens and these will lead to the increase in government expenditure. It also suggests that as the national income of a country increases, so does its government expenditure. Wagner observes government expenditure as endogenous factor that is determined by the growth of national income (Tang, 2001). Therefore, national income leads to government expenditure. According to Bird (1971), the Wagner's Law suggests that the relationship between government expenditure and economic growth is that during the process of economic development, government spending has a tendency to increase relative to national income.

According to the Wagner's Law, there are reasons to expect the activities of the government to increase. Chang (2002) states the reasons as follows:

i) The administrative and protective functions of the state have to expand due to the rising complexity of legal relationship and communications – the increase in population also requires higher public spending on law and order and socio-economic regulation;

ii) Income elasticity of demand for public-provided goods such as education is greater than unity; and

iii) The technological needs of an industrialised society require larger amounts of capital than are forthcoming from the private sector.

This means that the state has to provide the necessary capital funds to finance large-scale capital expenditures. Uchenna and Evans (2012:30) argue that the "industries set up by the private sector will look forward to the government's involvement in ensuring sustainability and effectiveness through the provision of key facilities such as: infrastructures, health services and security. The provision of these facilities will involve an increase in government expenditure".

Some studies have criticised Wagner's Law. Wagner's Law is different from the Keynesian because it has long-term application, which makes it irrelevant in explaining short-term changes in government spending (Akpan, 2011). The law is applicable for an economy where the increase in income per capita is found to be as a result of development. The Wagner Law is based on Wagner's normative assumptions about the nature of the state and its behaviour. Seeber and Dockel (1978:341) conclude that "the hypothesis represents an opinion on what ought to happen as an economy becomes industrialized. Furthermore, the empirical content of the hypothesis is also suspect since it is not clear that the role of the state should necessarily increase through its takeover of private monopolies if they exist, nor is it clear that certain goods and services provided by government are luxuries. Therefore, the hypothesis is not very helpful in understanding the growth in neither government expenditure nor its future development. At best Wagner's hypothesis helps to illuminate part of past reality which did depend on the stage of development".

3.2.2 The Keynesian Theory of Public Expenditure

The Keynesian school believes in the use of fiscal policies to boost economic growth during recession. According to Ansari *et al.* (1997), the Keynesian views government

spending as an exogenous factor, which can be used as a policy instrument to influence growth. The government is believed to harmonize conflicts between private and social interests, resist exploitation by foreign interests and increase socially desirable investment (Tang, 2001). The Keynesians consider that the economy is made up of consumer spending, investment, government spending and net exports. They believe that during recession the economic growth can be improved by government spending without consumer spending, investment and net exports. The output of the economy is given by the below equation:

$$Y = C + I + G + NX \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 3.1$$

Where Y is the gross domestic product (GDP) or national income, C is the consumer spending, I is investment, G is government spending and NX is the net exports. An increase in output has to come from one of these components.

According to Jahan *et al.* (2014), during recession, there are some factors that reduce demand as spending goes down. Furthermore, during recession, uncertainty often erodes consumer confidence causing them to spend less. This reduction in spending by consumers can result in less investments spending by firms and this leaves the government with the task of increasing output (Jahan *et al.*, 2014). Therefore, government spending is seen as the only source that can move the economy out of recession. The Keynesians prefer the government to correct the market failures and believe that the government must solve problems in the short-run. In the Keynesian model, the effect of an increase in government expenditure on the economy is expansionary: the aggregate expenditure is increased which encourages production and income. This process materialises in a multiplier effect that also encourage private expenditure (Fourie & Burger, 2009). The increase in aggregate demand (AD) by the government in order to avoid recession is illustrated in Figure 3.1:

Figure 3.1: The Increase in Aggregate Demand
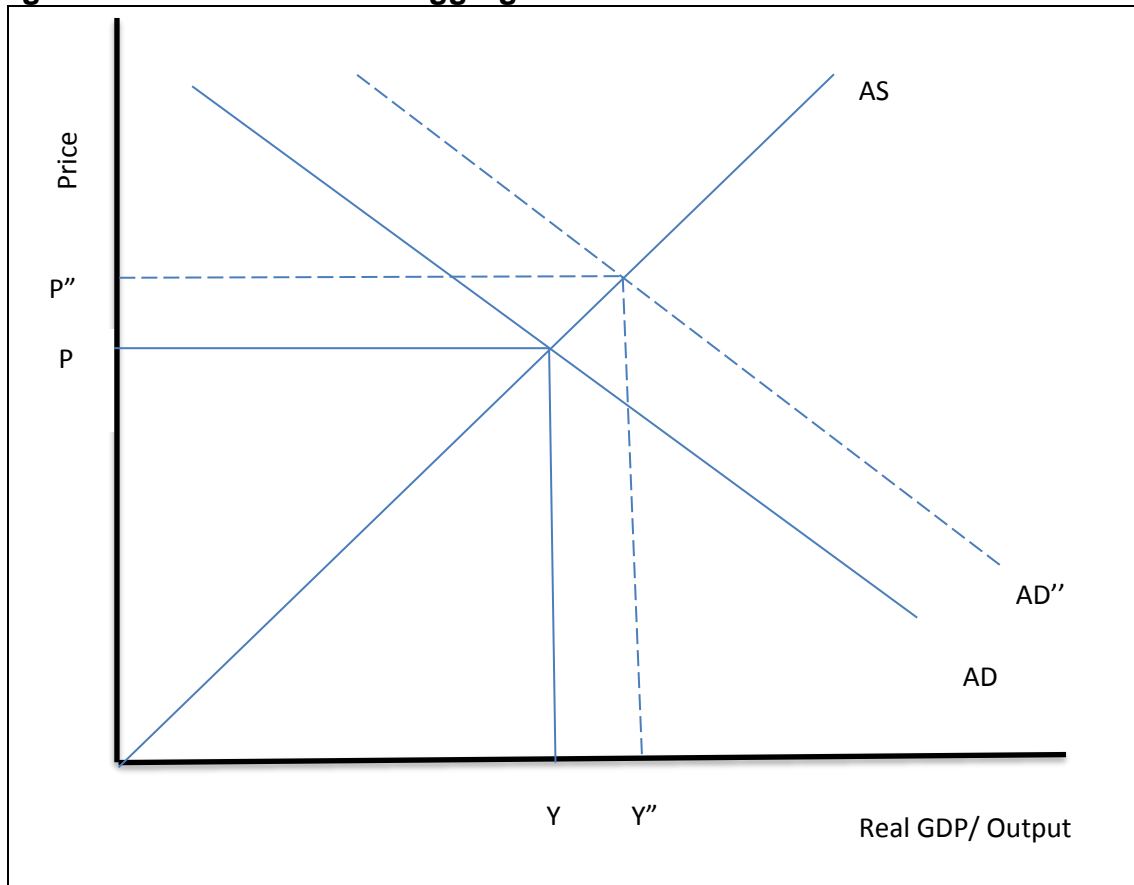
Source: Own computation

In Figure 3.1, the increase in government spending will shift the AD curve to the right to AD". This will result in a higher level of output and the price level. The increase in Y will increase consumer spending as they will spend the additional income on goods and services and through the accelerator effect investment will also increase (Tang, 2009). The changes in C, I, G and NX will directly influence the AD by shifting it to the right. Therefore, output increases in the short-run. The price level also increases from P to P" which can be inflationary. This type of inflation is demand-pull inflation. According to Mohr (2015), demand-pull inflation occurs when the aggregate demand for goods and services increases while the aggregate supply remains the same. This is due to the expansionary fiscal and monetary policy.

According to Jahan *et al.* (2014), the Keynesians will do the following to stabilise the economy during recession:

- Support deficit spending on labour-intensive infrastructure projects in order to stimulate employment and stabilise wages;

- Raise taxes to cool the economy and prevent inflation when there is abundant demand-side growth; and

- Use the monetary policy to encourage investment by reducing interest rates.

The government's role is often criticised on the grounds that it is less efficient in allocating resources than market forces (Ansari *et al.,* 1997). The monetarists, who focus on the role of money in the economy, suggest that the economy must focus on the money supply, rather than using government expenditure to control the economic activity and let the market take care of itself.

3.2.3 The Peacock-Wiseman Theory of Public Expenditure

The Peacock and Wiseman (P-W) model is based on the differences between politicians and taxpayers on the size and composition of the government budget (Legrenzi, 2004). Peacock and Wiseman (1961) assume that government expenditure increases due to the growth in revenue. According to P-W model, government expenditure will increase with respect to the growth of the economy. Peacock and Wiseman (1961), state that the reason is that the increase in government expenditure will depend on the revenue collected by the government. There is a big gap between the expectations of the people about public expenditure and the tolerance level of taxation. Therefore, the government cannot ignore the demands made by people for public goods and services, especially, when the revenue collection is increasing at constant rate of taxation. In addition, during certain periods such as war, the government will increase tax rates in order to raise more funds to meet the increase in government expenditure. After this period, the tax rates may remain at that level as people get used to them. Therefore, the increase in revenue collected will lead to an increase in government expenditure.

Peacock and Wiseman (1961) also identify displacement effects as the reason for the shift of the demand of public goods and services. The displacement effect was developed when they were analysing government expenditure in the United Kingdom from 1891 to 1955. It implies that government expenditure has the tendency to increase permanently during certain periods such as wars and other major social disturbance.

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In these instances, the government will be required to increase its spending in order to restructure the economy. The displacement effect will shift government expenditure and revenue to new high level. The government will have to revise its taxes to finance its new higher level of government expenditure. This has been noted by Peacock and Wiseman (1961:27) that "both citizens and government may, throughout such periods, hold divergent views about the desirable size of public expenditures and the possible level of government taxation. This divergence can be adjusted by social disturbances that destroy established conceptions and produce a displacement effect.

People will accept, in a period of crisis, tax levels and methods of raising revenue that in quieter times would have thought intolerable, and this acceptance remains when the disturbance itself has disappeared. As a result, the revenue and expenditure statistics of the government show a displacement after periods of social disturbance. Expenditures may fall when the disturbance is over, but they are less likely to return to the old level. The state may begin doing some of the things it might formerly have wanted to, but for which it had hitherto felt politically unable to raise the necessary revenues".

There is evidence that social disturbances contributed to the growth of government expenditure in South Africa pre-1994. This is supported by the study done by Lusinyan and Thornton (2007), who found that there has been displacement effect in South Africa from the 1960s. However, the displacement effect is criticised on the fact that although the government will increase the tax rates during the periods of social disturbances, it does not imply that all the individuals will accept the new tax rates.

Peacock and Wiseman (1979) proposed spend and tax hypothesis which is characterized by unidirectional causality running from public expenditure to government revenue. They argue that the temporary increases in government expenditure during the periods of social disturbance lead to permanent increases in government revenues. If the spend-revenue hypothesis holds, Narayan and Narayan (2006) suggest that the government spends first and pay for this spending later by raising taxes. This can lead to an outflow of capital as a result of the fear of paying higher taxes in the future.

3.2.4 Musgrave and Rostow's Theory of Public Expenditure

Musgrave and Rostow studied the growth of government expenditure and concluded that growth of government expenditure might be related to the pattern of economic growth and development in societies. This theory tries to relate the demand for public goods and services with the stages of development. During the early stages of development, government expenditure tends to increase as the government deals with the problem of market failure. In the last stages of development, the government expenditure will decrease while the private sector expenditure increases. According to Akpan (2011:63), the weakness of this theory is that "it has failed to explain the instance of high level of government expenditure which may still be experienced even in a highly developed economy whenever there is a serious down-turn in the economy". However, the theory is criticised on the fact that in reality some countries experience more than one stage of development at the same time. For example, in the urban areas, the stage of development might be on the middle or last stage while the rural areas are still at the early stages of development.

There are three stages in the development process (see Black *et al.*, (1999:90), namely:

i.   In the early stage of economic development, the government has to provide the basic infrastructure such as education, roads, hospitals, water, electricity, which is necessary to create an environment conducive to economic development. The implication of the first stage is that government expenditure will be high because most of the spending will be capital intensive.

ii. In the middle stages of development, the theory states that government will continue to provide investment goods, while private sector will be expected to drive development with the assistance provided by government in the first stage.

iii. In the last stage of development, capital expenditure as a percentage of GDP usually decreases as much necessary infrastructure is in place. At this stage, expenditure on education, health, welfare programmes and security increases because of the high income elasticity of demand for this services.

These theories highlight that government expenditure has the tendency to increase as the state of the economy changes.

3.3 Empirical Literature Review

This section analyses the studies that provide an understanding on the drivers that have been empirically found to determine government expenditure. Although the majority of the studies have been done in developed countries, there are a few studies on the determinants of government expenditure that have been done in developing countries, in general, and in South Africa, in particular.

Over the years, there have been numerous attempts to investigate the drivers of government expenditure in South Africa. For instance, Akitoby *et al.* (2006) studied the short- and long-term relationship between government spending and output in 51 developing countries that included South Africa using the error correction framework. The results of the study shows evidence that is consistent with the existence of cyclical ratcheting and voracity in government spending, which results in a tendency for government spending to rise over time. The study also found that output and government spending are co-integrated for at least one of the spending aggregates in 70% of countries. This implies a long-term relationship between government spending and output which is in line with Wagner's Law.

Furthermore, Nyamongo *et al.* (2007) investigated the relationship between government expenditure and government revenue in South Africa using the VAR approach. The study used monthly data from October 1994 to June 2004. The results of the study indicate that government expenditure and revenue are co-integrated, which implies that in the long-run, government expenditure and revenue are related. The findings of the study have policy implications in the short-and long-run. Firstly in the short-run, rejection of the fiscal synchronisation hypothesis confirms that expenditure decisions are made in isolation from revenue decisions. Secondly, the support of fiscal synchronisation hypothesis in the long-run implies that government expenditure and government revenue decisions are not made in isolation.

In another study, Alm and Embaye (2010) used the multivariate co-integration techniques and annual data for the period 1960 to 2007 to estimate the determinants of real per capita government spending in South Africa. The results of the study reveal that per capita government spending, per capita income, the tax share, and the wage rate are co-integrated. This supports the opinion that government spending is not only

related to national income and the true cost public service provision as captured by the wage rate but it is also associated with fiscal illusion caused by the budget deficits. The study concludes that both institutional and a-institutional factors explain quite well the relationship between public spending, national income, tax share and wage rate in South Africa. The external conditions such as wars and oil prices are found to play an important role in explaining the dynamics of government expenditure per capita growth.

Beyond South Africa, there is also much coverage on the determinants of government expenditure. Abizadeh and Gray (1985) used the Ordinary Least Squares (OLS) methodology while testing the validity of Wagner's Law for 53 countries grouped into poor, developing and developed countries using pooled time-series, cross-section data from 1963 to 1979. The Wagner's Law was tested in model relating the growth of government expenditure to measures of economic development. The measures of economic development included in the model are GDP per capita; the agricultural ratio which is the proportion of national income generated in the agricultural sector; commercial energy consumption per capita, openness and financial intermediaries as the ratio of currency outside banks to the money supply. The findings were that the relationship between economic development and the growth of government expenditures is found to hold for the developing group of countries, but not for the poor, or for the developed groups. It further concludes that as the economic development increases, the government expenditure ratio will decrease for the developed countries.

In Nigeria, Taiwo (1989) investigated the determinants of Federal Government expenditure in Nigeria using time-series data for the period from 1960 to 1982. Using the two-stage least squares (2SLS) methodology, the study found that recurrent expenditure in period t depends on recurrent expenditures in periods t_1 and t_2, while capital expenditure in period t depends on government revenue in period t and capital expenditure in period t_1. It also found that interest rate plays no significant role in explaining government capital expenditure. The study suggests that the behaviour of Federal government consumption expenditure depends on the spending of the previous years.

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Devarajan *et al.* (1996) studied the relationship between the composition of government expenditure and economic growth for 43 developing countries using data from 1970 to 1990. The data included total central government expenditure (including current and capital), expenditures on defence, health, education, transport and communication. The findings of the study were that an increase in the share of current expenditure has positive and statistically significant growth effects while there is a negative relationship between capital expenditure and per capita growth. The results of the study imply that developing countries have been misallocating expenditures by spending on capital expenditures at the expense of current expenditures.

Randolph *et al.* (1996) empirically studied the factors that influence public investment in transportation and communication infrastructure. They used pooled cross-national and time-series data from 1980 to 1986 for low and middle-income economies. Some of their findings are that governments that are not committed to alleviating poverty spend less from the central budget on infrastructure; the consolidated government spending declines with higher population densities; and the size of the budget deficit does not influence the central budget spending but is positively associated with consolidated budget spending.

Chletsos and Kollias (1997) investigated the validity of Wagner's Law of increasing state activity in Greece from 1958 to 1993 using an error correction approach. It was found that in Greece, the Wagner's Law is valid in the growth of defence expenditure. According to Chletsos and Kollias (1997), it seems that the military expenditures have been influenced by economic growth which has resulted in the allocation of more resources to defence uses. The study suggests that the growth of government expenditure in Greece is not directly dependent on and determined by economic growth as Wagner's Law states.

In the US, Huang and McDonnell (1997) examined the growth of government expenditure using quarterly data for the period from 1948 to 1990. The study found that income per capita, unemployment rate, total government civilian employment and military spending have a positive and significant relationship with total government expenditure ratio. The rate of openness and the two dependency ratio for the old and

youth respectively were found to be insignificant in explaining the growth of government expenditure in the US.

Rodrik (1998) studied the relationship between openness and government expenditure for 23 OECD countries. The regression included the following explanatory variables of government spending: trade openness, GDP per capita, the dependency ratio in the population, the urbanisation rate and dummies. The results indicate that income is a negative determinant of government spending. The dependency ratio is found to have a positive and significant influence on government spending. The results also show that urbanisation rate have a negative and significant relationship with government spending. Trade openness was also found to have a positive and significant influence on government spending.

Kolluri *et al.* (2000) examined the Wagner's Law which emphasizes on economic growth as an important determinant of government expenditure growth. The study used times series data for G7 industrialised countries for the period from 1960 to 1993. In addition, Kolluri *et al.* (2000) estimated the error correction model to capture the short-run effect of a random government spending stock on long-run equilibrium behaviour. The results of the error correction model indicate that economic growth is positive and statistically significant for the most countries tested. This indicates that national income has an important influence on government expenditure in the short-run.

Fölster and Henrekson (2001) empirically studied the relationship between government size and economic growth. They did an econometric panel study on a sample of rich countries for the period from 1970 to 1995. The study found that there is a robust negative relationship between government expenditure and economic growth in rich countries. Even when the sample of rich countries is extended to non-OECD countries, the results still indicate that government expenditure is negatively associated with economic growth.

For the US, Islam (2001) re-examined the Wagner's hypothesis from 1929 to 1996. The study used the Johansen-Juselius co-integration and exogeneity tests and found a long-run equilibrium relationship between the relative size of government spending

and per capita income. It also found evidence in support of the Wagner's Law in the US.

Chang (2002) examined the different versions of Wagner's Law by using annual time-series data on six countries over the period from 1951 to 1996. The countries are South Korea, Taiwan, Thailand, Japan, the USA and the United Kingdom. The study was based on Johansen-Juselius co-integration and error correction modelling techniques. The results of the study show that there is a long-term relationship between income and government spending in the study countries except for Thailand.

Rad (2003) studied the effect of inflation on government revenue and expenditure for the Islamic Republic of Iran. The study used three-stage least squares (3sls) method to examine the effect of inflation on government revenue and expenditure, using quarterly data from 1981:1 to 1997:1. The major finding of the study is that the government budget deficit increases in the inflationary condition. The deficit also increases money supply, which tends to increase inflation in Iran. The study concludes that the rate on inflation has a tendency to increase nominal government expenditure faster than government revenue.

Mahdavi (2004) examined the effects of external public debt burden on the composition of public spending for 47 developing countries covering the period from 1972 to 2001. The study found that a higher debt burden is significantly associated with a larger size of the government. The study also found that external debt changed the composition of spending in favour of interest payments and displacing the share of non-wage goods and services category. The category of public capital expenditure decreased as the debt burden increases. The results of the study suggest that external debt has an important influence in the allocation of the government budget.

Remmer (2004) studied the effect of foreign aid on government expenditure in middle- and lower-income countries using data from 1970 to 1999. The study found that dependence on foreign aid led to the growth of government expenditure in middle-and lower-income nations. The study further suggests that foreign aid is starting to become an important determinant of government size. The author also states that aid has a

strong influence on government expenditure than per capita income, population size, trade openness and age structure.

Huang (2006) tested the Wagner's Law in China and Taiwan using time-series data for the period from 1979 to 2002. The study used the Bounds Test based on Unrestricted Error Correction Model (UECM) to estimate the long-run relationship between government expenditure and output. The results of the study found that there is no long-run relationship between government expenditure and output in both countries.

Sinha (2007) studied the Wagner's hypothesis for Thailand from 1950 to 2003. The results from the Autoregressive Distributed Lag (ARDL) tests of co-integration indicated a very weak long-run relationship between GDP and government expenditure. Therefore, Sinha (2007) concludes that there is no much evidence to support the Wagner's law in Thailand.

Kimakova (2009) investigated the relationship between trade openness and government size for 87 developing and developed countries between 1976 and 2003. The results of the study indicate that age dependency and urbanisation are positively associated with government size. Trade openness is found to have a positive and significant relationship with government expenditure. The results also show that population has a negative influence due to the fixed costs and economies of scale associated with public goods (Kimakova, 2009).

In a multi-country study, Lamartina and Zaghini (2010) tested the Wagner's hypothesis in 23 OECD countries from 1970 to 2006 using the panel co-integration analysis. The empirical findings of the study indicated a positive correlation between public spending and per-capita GDP. The study also found that the correlation is usually higher in countries with lower per capita GDP. This suggests that the catching-up period is characterised by a stronger development of government activities with respect to economies in a more advanced state of development.

Shonchoy (2010) examined the pattern of government consumption expenditure in developing countries and also estimated the determinants which have influenced

government expenditure. The study used the random effect estimation for the panel data set of 111 developing countries from 1984 to 2004. The results of the study found that political, institutional and governance variables have significant influence on government expenditure. It also found that corruption has a negative influence on government consumption expenditure in the developing countries while demographic patterns of population have a positive impact. The study recommends that the government improves and restructures the composition of government expenditure by increasing the share of spending categories that are less sensitive to corruption such as education.

Magazzino (2011) examined the relationship between government expenditure and inflation for the Mediterranean countries using the time-series approach for the period from 1970 to 2009. The results show that there is a long-run relationship between the growth of government spending and inflation only for Portugal.

Zakaria and Shakoor (2011) investigated the effect of trade openness on the government size using data for the period from 1947 to 2009 in Pakistan. The study included trade openness, domestic income, democracy, foreign debt, inflation, domestic investment and urbanization rate as the explanatory variable of government spending. The results of the study indicates that trade openness, income, democracy, foreign debt and investment have a positive and significant impact on government expenditure. The study also found that inflation rate and urbanisation have a negative and significant impact on government expenditure.

Ofori-Abebrese (2012) examined the influence of inflation, real GDP, trade openness, population growth, and relative price on government consumption expenditure in Ghana. The study used the multivariate co-integration techniques to examine the short-run and long-run relationship from 1977 to 2007. The results of the study indicate that real GDP, trade openness and inflation have a negative influence on government consumption expenditure. The study also found that higher relative rice levels and larger population size increase government consumption expenditure.

Uchenna and Evans (2012) studied the behaviour of government expenditure in Nigeria for the period from 1961 to 2009 using the VAR technique. The study found

that government expenditure in Nigeria responds largely to fiscal decentralisation and political instability than economic growth. The results of the study suggest that the behaviour of government expenditure in Nigeria can be explained more by the Leviathan and Peacock-Wiseman Displacement theories than Wagner's theory. Since fiscal decentralisation influences the pattern of government expenditure, the study recommends that the government should focus on the efforts that will lead to revenue generations by the State Governments (SG) as it will help to solve some of the fracas caused by the issue of revenue sharing formula and its aftermaths.

Ageli (2013) examined the relationship between government expenditure and economic growth in Saudi Arabia using time-series data for the period from 1970 to 2012. The relationship was examined using the six versions of Wagner's Law that have been developed over the years. The study employed the OLS methodology. The study found that the Wagner's Law holds in Saudi Arabia through the co-integration analysis. The study concludes that the co-integration relationship indicates that, in the long-run, national income is the major determinant of government expenditure in Saudi Arabia.

Thamae (2013) analysed the factors that contributes to the growth of government spending in Lesotho using the multivariate co-integration techniques and time-series data from 1980 to 2010. The results indicate that government spending is positively related to income and population while negatively related to the tax share in the long run. The study also found that the role of internal and external shocks on government spending is not important in determining the growth of government expenditure in Lesotho.

Richter and Paparas (2013) investigated the long-run relationship between national income and government spending in Greece from 1833 to 2010. The empirical findings of the study provide support of the validity of Wagner's Law. The conditions in Greece were also found to be conducive for Wagner's Law since the period covered includes early stages of development, industrialisation and modernisation of the Greek economy. The results also indicate a long-run relationship between government spending and national income.

Ukwueze (2015) studied the determinants of the size of public expenditure in Nigeria using data from year 1961 to 2012. The study employed the OLS techniques to estimate the regression. The results of this study showed that the size of revenue, growth rate of national income (output) and private investment significantly influence the size of public expenditure both in the short-run and long-run. It also found the external and domestic debts to significantly influence the size of government expenditure but only in the short-run. The study recommended that the revenue base should be expanded; conducive environment should be created for private investment to thrive; and debt accumulation should be reduced and used for stabilization only in the short-run. The study further concluded that that revenue, private investment and income boost public spending while public debts might be counterproductive.

Most recently, Turan and Karakas (2016) examined the effect of trade openness and per capita GDP on the size of government for Turkey and South Korea using ARDL approach to co-integration. The result shows that in the long-run, per capita GDP has a positive and significant influence on the government size for both countries. The results also indicate that per capita GDP has a significant and negative impact for Korea in the short-run. The results further show that trade openness has a negative effect on government size in Turkey, while it has a positive effect for South Korea. The impact of trade openness is only significant for Turkey in the short-run. The study suggests that, based on the experience of these countries, it is beneficial for a country to have a more open economy as a strategy of development. However, the strategy should be accommodated with the increase in government size to provide necessities that export-oriented industries demand.

The empirical literature of selected studies reviewed is this section is summarised in Table 3.1.

Table 3.1: Summary of Selected Empirical Literature on the Determinants of Government Expenditure

Study	Country	Methodology	Findings
Abizadeh and Gray (1985)	53 countries grouped into poor, developing and developed	Ordinary Least Squares (OLS)	Wagner's Law is found to hold only for developing group of countries and not for poor or for the developed groups of countries.
Taiwo (1989)	Nigeria	Two-stage least squares (2SLS)	Recurrent expenditure in period t depends on recurrent expenditures in periods t_1 and t_2, while capital expenditure in period t depends on government revenue in period t and capital expenditure in period t_1.
Chletsos and Kollias (1997)	Greece	Error correction mechanism (ECM)	Government expenditure is not directly determined by economic growth.
Kolluri *et al.* (2000)	GE industrialised countries	Error correction model	National income has an important influence on government expenditure in the short-run.

Chang (2002)	Six countries	Johansen-Juselius co-integration and error correction modelling (ECM) techniques	There is a long-run relationship between income and government spending for the countries except for Thailand.
Rad (2003)	Republic of Iran	Three-stage least squares	Inflation leads to an increase nominal government expenditure
Akitoby *et al.* (2006)	51 developing countries including South Africa	Error correction framework.	There is support for Wagner's law.
Huang (2006)	China and Taiwan	Bounds Test based on Unrestricted Error Correction Model (UECM)	There is no long-run relationship between government expenditure and output in both countries.
Nyamongo *et al.* (2007	South Africa	VAR approach	There is a long-run relationship between government expenditure and revenue.
Sinha (2007)	Thailand	Autoregressive Distributed Lag (ARDL)	A weak long-run relationship between GDP and government expenditure.

Alm and Embaye (2010)	South Africa	Multivariate co-integration techniques	Government spending per capita, per capita per capita income, the tax share, and the wage rate are co-integrated.
Magazzino (2011)	Mediterranean countries	Time-series approach	There is a long-run relationship between the growth of government spending and inflation only for Portugal.
Ofori-Abebrese (2012)	Ghana	Multivariate co-integration techniques	Real GDP, trade openness and inflation have a negative influence on government consumption expenditure. Relative price and population growth have a positive influence on government consumption expenditure.
Uchenna and Evans (2012	Nigeria	VAR technique	Government expenditure responds largely to fiscal decentralisation and political instability than economic growth.
Ageli (2013)	Saudi Arabia	Ordinary Least Squares (OLS) techniques	National income is the major determinant of government expenditure.

Thamae (2013)	Lesotho	Multivariate co-integration techniques	Government spending is positively related to income and population while negatively related to the tax share in the long-run.
Ukwueze (2015)	Nigeria	Ordinary Least Squares (OLS) techniques	The size of revenue, growth rate of national income (output) and private investment significantly influence the size of public expenditure both in the short-run and long-run. The external and domestic debts significantly influence the size of government expenditure only in the short-run.
Turan and Karakas (2016)	Turkey and South Korea	ARDL approach	There is evidence of Wagner" Law. Openness has a positive effect on the government size in Korea while it has a negative effect in Turkey

3.4 Conclusion

The chapter has reviewed the theoretical and empirical literature on the determinants of government expenditure. The theories that were reviewed are Wagner's Law, Keynesian theory, Peacock-Wiseman theory and Musgrave and Rostow theory. Wagner's Law states that the government will increase the level of public spending as the economy grows. However, this is in contrast to the Keynesian belief. The Peacock and Wiseman model states that the increase in government spending will depend on the level of revenue; while Musgrave and Rostow believe that the growth of government expenditure might be related to the pattern of economic growth. The empirical studies conducted on determinants of government expenditure were also reviewed. The majority of the studies concluded that economic growth, revenue and inflation significantly have a positive effect on government spending. The empirical literature review has also shown that the relationship between government expenditure and its determinants differ from country to country, methodology used and the measure of government expenditure used.

CHAPTER FOUR : METHODOLOGY

4.1 Introduction

This chapter covers empirical model specification as well as the theoretical and empirical underpinnings of the specified model. Discussed in this chapter as well are the estimation techniques. The chapter is divided into four sections. Section 4.2 discusses the empirical model used in this study as well the theories underpinning the model, definitions of variables and data sources. In Section 4.3, the techniques used to estimate the model are presented. Finally, Section 4.4 concludes the chapter.

4.2 Empirical Model Specification

4.2.1 General Empirical Model

The dynamic relationship between government expenditure and its determinants is examined using the Error Correction Model (ECM) approach. The empirical model used in this study is the modified version of the model used by Shelton (2007), Huang and McDonnell (1997) and Fielding (1997). The studies modelled government expenditure as a function of revenue, national income, public debt, inflation, interest rates, exchange rates, population and trade openness. This study modelled government expenditure as a function of poverty reduction, urbanisation rate, population growth, national income, inflation rate, trade openness and wage rate. The empirical model used in this study is, therefore, expressed in functional form as follows:

$$GE_t = f(\,POV_t\,,URB_t,PG_t,Y_t,INF,TO_t,WR_t)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.1$$

The function in equation (4.1) is expressed in the form of a linear regression model in equation (4.2):

$$GE_t = \alpha_0 + \beta_1 POV_t + \beta_2 URB_t + \beta_3 PG_t + \beta_4 Y_t + \beta_5 INF_t + \beta_6 TO_t + \beta_7 WR_t + \mu_t \ldots\ldots.4.2$$

Where;

GE = Government Expenditure

POV = Poverty Reduction

URB = Urbanisation

PG= Population Growth

Y = National Income

INF= Inflation Rate

WR= Wage Rate

TO = Trade Openness

α_0 = constant term

$\beta's$ = coefficients

μ_t = error term

t = time/period

The variables are converted to logarithms in order to obtain elasticity coefficients on these variables and minimise the impact of outliers. In a log-linear specification, equation (4.2) is of the form:

$$InGE_t = \alpha_0 + \beta_1 InPOV_t + \beta_2 InURB_t + \beta_3 InPG_t + In\beta_4 Y_t + In\beta_5 INF_t + In\beta_6 TO_t$$
$$+ In\beta_7 WR_t + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 4.3$$

4.2.2 Theoretical and Empirical Underpinnings of the Model

The ratio of government expenditure to GDP is used as a proxy for government expenditure. The choice of the proxy is based on the procedure adopted by most scholars who relate government expenditure to GDP (Henrekson & Lybeck, 1988). Previous studies such as Menyah and Wolde-Rufael (2012), Magazzino (2011), Narayan (2005) and Ghali (1999) have used the ratio of government expenditure to GDP as the dependent variable where government expenditure on consumption, investment and transfer payments is not divided. With regards to transfer payments on whether it should be included or not – some support its inclusion, arguing that the distribution of income would adjust resource allocation (Huang & McDonnell, 1997). Others argue that it should be excluded from government expenditure because their inclusion overstates the size of government (Musgrave & Musgrave, 1989). Since the aim of this study is to determine why government expenditure has continued to increase over the years, the ratio of government expenditure to GDP should give a satisfactory representation of the pattern of government growth.

There are a number of proxies that have been proposed in literature to measure poverty. Some studies have used the Gini coefficient and income per capita as measures of poverty (see Odhiambo, 2009). In this study, consumption per capita will be used as a proxy for poverty reduction. According to Odhiambo (2009:323), "this measure is consistent with the World Bank's definition of poverty as the inability to attain a minimal standard of living measured in terms of basic consumption needs". When government expenditure is allocated to investment which will promote economic growth, it can assist in reducing poverty by creating employment. Government expenditure plays a major role in reducing poverty. When inequality continues to grow, poverty will increase and this will lead to more redistribution through transfers of social services and provision of public goods and services. Milanovic (2000) concludes that countries with high inequality of income redistribute more to the poor while Basset *et al.* (1999) found that there is a negative relationship between inequality and government transfers. Therefore, the expected sign for the coefficient of poverty is expected to be positive in this study.

Demographic factors such as population growth and urbanisation are also considered as determinants of government spending. According to Alm and Embaye (2010), as the population grows, the density of population is likely to increase as more people move in urban areas and government intervention will be required as market solutions become less efficient. As people move to urban areas, the standard for the demand of health, education and security services rises. This will lead to an increase in government expenditure. However, many studies that examined the impact of urbanisation on government size have found mixed results. Some studies found a positive relationship between urbanisation and government size (Jin & Zou, 2002; Kimakova, 2009). Some studies such as Rodrik (1998) determined that urbanisation has a negative impact on government size. Therefore, a prior expectation is that urbanisation will either have a positive or negative relationship with government expenditure in this study. In this study, urbanisation is represented by the urbanisation rate.

According to Peacock and Wiseman (1961), population growth can cause a rise in government expenditure such as education, health and security since it is the responsibility of the government to provide basic services to the public. The

establishment of social service facilities, schools and hospitals has to be developed with population growth in mind. The relationship between population and government expenditure is ambiguous. Shonchoy (2010) and Alesina and Wacziarg (1998) found a negative relationship between population and government expenditure. For this study, a positive relationship between population growth and government expenditure is expected.

The use of national income as the determinant of government expenditure has been justified in theoretical literature. Musgrave (1969) interprets the Wagner's Law in relative terms, which suggests that as per capita income grows, the government size also grows. The principle of the Wagner's Law claims that the ratio of government expenditure to GDP is positively related to GDP per capita (see Shelton, 2007). The demand for public goods has the tendency to grow with the increase in per capita income. As the income increases, the demand for goods and services including public goods and services will also increase leading to the rise in government expenditure. In this study, real GDP per capita is used as a proxy for income. Some empirical studies on the relationship between national income and government expenditure identified a negative relationship (Landau, 1983; Robert & Alexander, 1990; Folster & Henrekson, 1999). In other cases, a positive relationship was found (Huang & McDonnell, 1997; Fielding, 1997). Therefore, a prior expectation is that national income will either have a positive or negative relationship with government expenditure in this study.

The relationship between inflation rate and government spending is mixed. Opler (1988) has theorised that inflation leads to growth in the real public expenditure share of real GDP while Lin (1992) established that inflation reduces government expenditure share of real GDP. According to Lin (1992:86), the negative effect of inflation could be due to the following:

(i)   a decline in real tax revenues due to inflation;

(ii) pressure to fight inflation by cutting government expenditures; and

(iii) typically government-fixed nominal expenditure levels at the beginning of the fiscal year based on estimations of tax revenues and the desirable debt level. Inflation is measured by the consumer price index (CPI).

The motivation for using inflation rate as one of the determinants of government expenditure is based on previous studies such as Fielding (1997), Ezirim *et al.* (2008) and Magazzino (2011) that have found a significant relationship between the two variables. In a recent study, Magazzino (2011) found that inflation causes government expenditure growth. In this study, the relationship between the rate of inflation and government expenditure is expected to be negative as inflation reduces the real value of government revenue which limits the government's ability to spend.

Government provides goods and services that the private sector would not be able to provide. An increase in the provision of public goods leads to an increase in the price of government output. The growth of government employment is a factor that has been theorised to affect government share of output (Huang & McDonnell, 1997). According to Berry and Lowery (1984:5), "Beck implied that public sector wages are a direct function of private wages which in turn influence relative prices because of the lower levels of productivity improvement found in the public sector". The wage rate has been used by Alm and Embaye (2010) and Thamae (2013) to show the true cost of public service provision in determining the factors that explain the growth of government expenditure South Africa and Lesotho, respectively. The proxy for the wage rate is given by the unit labour cost in the manufacturing sector. The expected sign of the wage rate is positive because of the supply side effects of the Baumol Disease (Baumol, 1967).

Trade openness, which is measured by the ratio of imports plus an export to GDP, is also considered as a determinant of government expenditure. Rodrik (1998) suggests that the relationship between trade openness and government size can be explained by the compensation hypothesis. The dependency of a country on foreign trade increases the volatility on domestic markets brought by the dependence on the development of its trading partners. This creates incentives for the government to provide social security against international generated risks. The use of trade openness as the determinant of government expenditure is motivated by the use of the proxy by previous studies such as, Garrett (2001), Rodrik (1998), Alm and Embaye (2010) and Huang and McDonnell (1997). Trade openness and government expenditure are expected to have a positive relationship as the country that is open has a greater demand for government transfers in the form of social protection

(Cameron, 1978). Additionally, as observed by Rodrik (1998), trade openness has a positive correlation with the government expenditure.

4.2.3 Definition and Measurement of Variables

Government expenditure (GE): Government expenditures include intermediate consumption, compensation of employees, subsidies, social benefits, other current expenditures (including interest spending), capital transfers and other capital expenditures (OECD, 2013). In this study, government expenditure is measured by government expenditure as a percentage of GDP.

Poverty (POV): Poverty is proxied by consumption per capita. Consumption per capita is household (private) consumption divided by total population.

Urbanisation (URB): urban population refers to people living in urban areas as defined by national statistical offices (World Bank, 2015). In this study urbanisation is measured by urbanisation rate. Urbanisation rate is urban population growth rate minus population growth rate

Population (PG): According to the World Bank (2015), population includes all residents regardless of their legal status or citizenship, except for refugees not permanently settled in the country of asylum and who are generally considered part of the population of the country of origin. In this study population is measured by the growth rate of population.

National income (RI): Real income is proxied by GDP per capita. The GDP per capita is gross domestic product divided by mid-year population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (World Bank, 2015).

Inflation rate (INF): Inflation is measured by the consumer price index (CPI). It reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly (World Bank, 2015).

Wage rate (WR): wage rate is proxied by the unit labour costs in the manufacturing sector. In this study it measures the true cost of public service provision.

Trade openness (TO): Trade openness is measured by the ratio of imports plus an export to GDP. It is also used as a proxy of globalisation. Economic globalisation has been defined by Fischer (2003:3) as the "on-going process of greater economic interdependence among countries; and is reflected in the increasing amount of cross-border trade in goods and services, the increasing volume of international financial flows and increasing flows of labour".

4.2.4 Data Sources

This study utilised annual time-series data, covering the period from 1970 to 2014. The following series for the said period were obtained from the South African Reserve Bank (SARB) and World Bank Economic Indicators. The variables included are government expenditure as a percentage of GDP, real GDP per capita (expressed in constant 2005 US$), urbanisation rate, population growth, wage rate, poverty, inflation rate and trade openness.

4.3. Estimation Techniques

In this study, the techniques used to estimate the dynamic relationship between government expenditure and its determinants involves three steps. The first step is to determine the number of times a variable is differenced to achieve stationarity. The second step is to determine the existence of a long-run relationship among the variables in the model using the Johansen-Juselius co-integration test. In the last step, the Error Correction Model (ECM) is employed to examine the key determinants of government expenditure in South Africa. The steps are discussed in detail in the sections that follow – Sections 4.3.1 to 4.3.3.

4.3.1 Stationary Tests

Gujarati (2003:797) states that "a time-series is said to be stationary if its mean and variance are constant over time and the value of the covariance between the two periods depends only on the distance or gap or lag between the two periods and not the actual time at which the covariance is computed". According to Gujarati (2003), a time-series Y_t is said to be weakly stationary if:

i)   A constant mean: $E(Y_t) = \mu$ … … … … … … … … … … … … … … … … … … …4.4

ii)   A constant variance: $\text{var}(Y_t) = E(Y_t - \mu)^2 = \sigma^2$ … … … … … … … … … … …..4.5

iii) And a constant auto covariance: $\gamma_k = E[(Y_t - \mu)(Y_{t+k} - \mu)]$ … … … … … … … …..4.6

Where γ_k, covariance (or autocovariance) at lag k, is the covariance between the values of Y_t and Y_{t+k} that is, between two Y values k periods apart. If $k = 0$, Y_0 is obtained, which is simply the variance of $Y (= \sigma^2)$; if $k = 1$, $Y1$ is the covariance between two adjacent values of Y.

This means that if a time-series is stationary, its mean, variance and auto-covariance will be the same at each given time. If a time-series is not stationary it is called non-stationary time-series. It will have a time varying mean or a time varying variance or both.

If the variables are non-stationary, the technique will result in spurious regressions. According to Stern (2011), spurious regression is one in which variables seem to be statistically significant but the variables are unrelated. It is important that time-series data is tested for stationarity. According Gujarati (2003:798), it is important because if a time-series is non-stationary, its behaviour can only be studied for the period under consideration. Each set of time-series data will, therefore, be for a particular episode. As a result, it is not possible to generalise it to other time periods.

When a variable is non-stationary it must be differenced to make it stationary. If a series is differenced once to become stationary, then that series is integrated of order $I(1)$. In general, if the time-series has to be differenced d times before it becomes stationary; it is said to be integrated of order $I(d)$ (Brooks, 2002). If a time-series is stationary and does not require differencing, it is said to be integrated of order $I(0)$. There are several tests for stationarity. For this study, the Augmented Dickey Fuller (ADF), Dickey-Fuller Generalised Least Square (DF-GLS) and Phillips-Perron (PP) tests for stationarity are used.

4.3.1.1 Augmented Dickey Fuller Test

The error terms in the Dickey-Fuller (DF) test normally provide evidence of serial correlation (Mahadeva & Robinson, 2004). Therefore, Dickey and Fuller have developed a test known as the Augmented Dickey-Fuller (ADF). The ADF test is conducted by adding the lagged values of the dependent variable ΔY_t in order eliminate autocorrelation in a model (Asteriou & Hall, 2007). According to Gujarati (2003:817), the ADF test is estimated by the following equation:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha \, \Delta Y_{t-i} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots .4.7$$

Where ε_t is the white noise error term and $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$. Gujarati (2003) has stated that the number of lags to include is often determined empirically, so as to include enough terms so that the error term is serially uncorrelated. In equation 4.7, the null hypothesis that a series contains a unit root is tested against an alternative hypothesis that a series is stationary, that is:

$H_0: \delta = 0$, that is time-series is non-stationary

$H_1: \delta < 0$, that is time-series is stationary

4.3.1.2 Dickey-Fuller Generalised Least Square (DF-GLS)

Elliot *et al.* (1996) proposed the Dickey-Fuller Generalised Least Square (DF-GLS) test which is the, modified version of the Augmented Dickey-Fuller (ADF) t-test. They established that the DF-GLS test has a better overall performance, than the ADF tests, in terms of sample size and power. The test uses the generalised least squares (GLS) rationale, which de-trend the variable before running the regression. According to Elliot *et al.* (1996), the DF-GLS regression is estimated using the following equation:

$$\Delta y_t^d = \rho y_{t-1}^d + \beta_1 \Delta y_{t-1}^d + \cdots + \beta_p \Delta y_{t-i}^d + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.8$$

Where Δ is the difference operator, y_t^d is the generalised least squares de-trended value of the variable, ρ, β_1 and β_p are coefficients to be estimated and ε_t is the error term.

In equation 4.8, the null hypothesis that a series contains a unit root is tested against an alternative hypothesis that a series is stationary, that is:

$H_0: \rho = 0$, that is time-series is non-stationary

$H_1: \rho < 0$, that is time-series is stationary

The test uses the same critical values of the DF *t* statistic when there is no intercept (Elliot *et al.*, 1996).

4.3.1.3 Phillips-Perron Test

Phillips and Perron (1988) developed the unit root test that is a generalisation of the ADF test. The Phillips-Perron (PP) test differs from the ADF test in how it deals with serial correlation and heteroscedasticity in the error terms. According to Asteriou and Hall (2007), the equation for the PP test is the Autoregressive (AR (1)) process:

$$\Delta y_{t-1} = \alpha_0 + \gamma y_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.4.9$$

The PP test makes a correction to the *t*-statistic of the coefficient γ to account for the serial correlation in u_t while the ADF test corrects for serial correlation by adding lagged difference terms on the right hand side of the AR (1) regression (Asteriou & Hall, 2007). The PP *t*-statistic distribution has the same critical values as the ADF *t*-statistic. In equation 4.9, the null hypothesis that a series contains a unit root is tested against an alternative hypothesis that a series is stationary, that is:

$H_0: \gamma = 0$, that is time-series is non-stationary

$H_1: \gamma < 0$, that is time-series is stationary

The acceptance of H_0 implies that the series is non-stationary.

4.3.2 Co-integration test

Once it has been established that the variables under consideration are integrated of the same order, a co-integration test is performed. There are several ways of testing for co-integration; these include the Engle-Granger approach, and the Johansen-

Juselius (Johansen, 1988; Johansen & Juselius, 1990) approach, which is based on maximum likelihood estimation on a VAR system. This study uses the Johansen-Juselius co-integration approach in order to examine the long-run relationship between government expenditure and its main determinants. The Johansen-Juselius approach is chosen because it has some advantages over the Engle-Granger approach.

4.3.2.1 Johansen - Juselius Procedure

The Johansen-Juselius procedure is a test for co-integration that allows for more than one co-integrating relationship. The Johansen-Juselius procedure is employed to determine how many co-integrating relationships exist among the variables. It is important to determine the lag length before using the Johansen-Juselius procedure. The Akaike and Schwarz criteria will be used to determine the number of lags for the co-integration test.

According to Asteriou and Hall (2007:371), Johansen-Juselius procedure involves the following steps:

i. Step 1: test for the order of integration of the variables under examination. The objective is to have the stationary variables in order to detect, among them, stationary co-integrating relationships and avoid spurious regressions.

ii. Step 2: find the appropriate lag length because the standard error term must not suffer from non-normality, autocorrelation and heteroscedasticity. It is important to inspect the data and the relationship between the variables before the estimation as the setting of the lag length is affected by the omission of variables that might affect only the short-run behaviour of the model.

iii. Step 3: choose the appropriate model regarding the deterministic components in the multivariate system.

iv. Step 4: determine the rank of or the number of co-integrating vectors. Johansen (1988) and Johansen and Juselius (1990) suggested two procedures namely; the maximum eigenvalue and the trace statistic to be used to examine the number of vectors. The maximum eigenvalue tests the null hypothesis $\Pi = r$ against the alternative hypothesis that $\Pi = r + 1$. The null is that there are r co-integrating vectors and the alternative is that there are $r + 1$ vectors. The maximum eigenvalue test statistic is given by:

$$\lambda_{max}(r, r+1) = -T \ln (1 - \hat{\lambda}_{r+1}) \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots .4.10$$

Where *T* is the sample size, the *λ*'s are the eigenvalues which are ordered in descending order; *r* is the number of co-integrating vectors (see Asteriou & Hall, 2007).

The trace statistic tests the null hypothesis that the number of co-integrating vectors is less than or equal to *r*. If $\hat{\lambda}_i = 0$, then the trace statistic is equal to 0. The closer the characteristic roots are to unity, the more negative is the ln(1 - $\hat{\lambda}_i$) and therefore the larger the trace statistic (see Asteriou & Hall, 2007). The trace test statistic is in the form of:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{n} \ln(1 - \hat{\lambda}_{r+1}) \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots ..4.11$$

The critical values for both statistics are provided by Johansen and Juselius (1990). According to Brooks (2002), the distribution of the test statistics is non-standard, and the critical values depend on the value of *n – r,* the number of non-stationary components and whether constants are included in each of the equations. The null hypothesis is rejected if the test statistic is greater than the critical value.

4.3.3 The Error Correction Model (ECM)

If the variables in the model are co-integrated, the error correction model (ECM) will be estimated. The ECM "measures the speed of adjustment i.e. the rate at which the dependent variable adjusts to changes in the independent variable" (Isiaq and Bolaji, 2016:78). To estimate the ECM, it will involve estimating the model using the OLS. Then the predicted residuals from the regression are used in a regression of differenced variables and the lagged error term (see Mehra, 1991).

The ECM in this study is expressed as follows (see Mehra, 1991):

$$\Delta InGE_t = \alpha_0 + \sum_{i=1}^{m} \Delta InGE_{t-i} + \sum_{i=0}^{n} \beta_1 \Delta InPOV_{t-i} + \sum_{i=0}^{n} \beta_2 \Delta InURB_{t-i} + \sum_{i=0}^{n} \beta_3 \Delta InPG_{t-i}$$

$$+ \sum_{i=0}^{n} \beta_4 \Delta InY_{t-i} + \sum_{i=0}^{n} \beta_5 \Delta InINF_{t-i} + \sum_{i=0}^{n} \beta_6 \Delta InTO_{t-i} + \sum_{i=0}^{n} \beta_7 \Delta InWR_{t-i}$$

$$+ \gamma ECM_{t-1} + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.4.12$$

Where, Δ is the first difference operator, GE is Government Expenditure, POV is Poverty Reduction, URB is Urbanisation, PG is Population Growth, Y is Real Income, INF is Inflation Rate, WR is Wage Rate, TO is Trade Openness, γ is the speed of adjustment and should be negative and significant, and ECM_{t-1} is the lagged error term. The γ coefficient is the feedback effect and shows how much of the disequilibrium is being corrected, that is the extent to which any disequilibrium in the previous periods affects any adjustments in Y_t period (Asteriou & Hall, 2007).

According to Asteriou and Hall (2007:359), the ECM has the following advantages:
- It is a convenient model measuring the correction from disequilibrium of the previous period which has a very good economic implication.
- It is also designed in terms of first differences which usually eliminate trends from the variables involved and they resolve the problem of spurious regressions.
- The ease with which they can fit into the general to specific approach to econometric modelling, which is in fact a search for the most parsimonious ECM model that best fits given data set.
- The disequilibrium error term is a stationary variable and has important implications – one being that if the two variables are co-integrated, it implies that there is some adjustment process which prevents the errors in the long-run relationship from becoming larger and larger.

4.3.4 Diagnostic test

Diagnostic tests are conducted in order to examine the robustness of the specified model. The diagnostic checks are important because if there is a problem in the residuals, it is an indication that the model is not robust. The goodness of fit for the

model is tested by examining the heteroscedasticity, autocorrelation, and misspecification associated with the model.

4.3.4.1 Heteroscedasticity

The classical linear regression model (CLRM) assumes that the error terms have a constant variance (Asteriou & Hall, 2007). Heteroscedasticity is the error term that does not have a constant variance. According to Asteriou and Hall (2007), the presence of heteroscedasticity can be detected with the informal and formal methods. The informal way is done by inspecting the graphs and the formal way can be done by conducting tests such as Breusch-Pagan LM test, Glesjer LM test, Harvey-Godfrey LM test, Park LM test and White test among others. Asteriou and Hall (2007) stated that the White's test, developed by White (1980), is the more general test for heteroscedasticity since it eliminates the shortcomings of the other tests. Its advantages are that it does not assume any prior determination of heteroscedasticity, it does not depend on normality assumption and it proposes a particular choice for the variables in the auxiliary regression. This study uses the White test, which tests the null hypothesis of no heteroscedasticity against the alternative hypothesis of heteroscedasticity. If the LM-statistic is greater than the critical value or if the p-value is less than 0.05, the null hypothesis is rejected and it can be concluded that there is evidence of heteroscedasticity (Asteriou & Hall, 2007).

4.3.4.2 Autocorrelation

The CLRM assumes that the variances and correlations between different disturbances are all equal to zero (Asteriou & Hall, 2007). This implies that the error terms are independently distributed. The error terms are not independently distributed but are serially correlated if this assumption is violated. There are many factors that can cause serial correlation such as omitted variables, misspecification of the model and systematic errors in measurement (Asteriou & Hall, 2007). To detect if there is serial correlation, the formal and informal method will be used. The informal method is performed by the use of graphical analysis. The formal method can use tests such as the Durbin-Watson (DW) and Breusch-Godfrey LM test for serial correlation. The DW test has some disadvantages such as: it may give inconclusive results; it is not applicable when a lagged dependent variable is used; and it cannot take into account higher order of serial correlation (Asteriou & Hall, 2007). For these reasons, this study

uses the Breusch-Godfrey LM test, which can accommodate all the shortcomings of the DW test. The Breusch-Godfrey LM test tests the null hypothesis that there is no serial correlation against the alternative that there is serial correlation. If the LM statistic is greater than the critical value, the null hypothesis is rejected and it can be concluded that there is serial correlation (Asteriou & Hall, 2007).

4.3.4.3 Misspecification

According to Asteriou and Hall (2007), misspecification of the model includes omitting influential or including non-influential variables, measurement errors and wrong functional forms. Omitting influential variables is when the model excludes explanatory variables that are determinants of the dependent variable. Including non-influential variables is when the variables that do not have much influence on the dependent variable are included. The wrong functional form is when an assumption is made that an equation has a linear relationship while the relationship is non-linear. Measurement of error is when a variable is not measured correctly. The assumption of the CLRM assumes that the residuals are normally distributed with a mean of zero and a constant variance (Asteriou & Hall, 2007). To detect misspecification, the normality of the residuals is tested using the Jarque-Berra (JB) test to ensure that the residuals are normally distributed. If the JB statistic is greater than the critical value or the p-value is less than 0.05, the null hypothesis of normality of residuals is rejected (Asteriou & Hall, 2007).

4.4 Conclusion

This chapter has discussed the theoretical and empirical model specifications as well as the estimation techniques used in the study. The techniques used to estimate the model as well as data sources and definition of variables used in the study were discussed. The ADF, DF-GLS and PP test will be used to test the stationarity of the variables. The co-integration test using the Johansen-Juselius procedure will be conducted when it has been established that the variables under consideration are integrated of the same order. The study will use the ECM approach to determine the short- and long-run relationship between government expenditure and its determinants. The diagnostic tests for heteroscedasticity, serial correlation and normality will be conducted to ensure that the model is correctly specified.

CHAPTER FIVE : ECONOMETRIC ANALYSIS AND EMPIRICAL FINDINGS

5.1 Introduction

This chapter presents the econometric analysis and the empirical findings for this study using the model and the methodology discussed in the previous chapter. This study employs error correction model (ECM) testing approach to establish the relationship between government expenditure and its determinants within the specified model. The chapter is divided into five sections. The second section presents the stationarity test results. The third section presents the findings from the co-integration test. The fourth section presents the results from the ECM; and lastly, the conclusion of the chapter is presented.

5.2 Stationarity Test Results

The stationarity tests were carried out using the Augmented Dickey Fuller (ADF), Dickey-Fuller Generalised Least Square (DF-GLS) and Phillips – Perron (PP) tests. For all the tests, the null hypothesis of the presence of unit root (non-stationarity) was tested against the alternative hypothesis of the absence of a unit root (stationarity). The results of the stationarity tests carried out for all variables in levels and in first difference are reported in Table 5.1.

Table 5.1: Stationarity Test Results for all Variables

Stationarity of all Variables in Levels							Stationarity of all Variables in First Difference					
	ADF		DF-GLS		PP		ADF		DF-GLS		PP	
Variable	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept
GE	-2.546	-2.951	-1.035	-2.769	-2.527	-3.158	-7.149***	-7.041***	-2.454**	-4.148***	-7.810***	-7.685***
POV	-1.014	-1.176	-0.921	-1.319	-1.085	-1.176	-6.189***	-6.189***	-6.241***	-6.247***	-6.194***	-6.181***
URB	-1.020	-0.924	-1.330	-1.643	-1.020	-1.138	-5.509***	-4.594***	-1.893*	-2.948*	-5.520***	-6.657***
PG	-1.119	-3.024	-1.095	-2.000	-1.247	-2.201	-4.574***	-4.538***	-4.036***	-4.566***	-3.556***	-3.495***
Y	-0.961	-1.229	-0.900	-1.429	-0.626	-0.898	-4.295***	-4.368***	-4.146***	-4.294***	-4.288***	-4.254***
INF	-2.531	-2.783	-1.235	-2.602	-2.513	-3.486*	-5.826***	-5.896***	-5.598***	-6.419***	-7.937***	-10.413***
WR	-1.526	-2.307	-0.041	-2.110	-1.502	-2.295	-6.908***	-6.885***	-6.978***	-7.033***	-6.981***	-7.008***
TO	-1.697	-1.811	-1.580	-1.896	-1.670	-1.790	-6.016***	-5.962***	-6.075***	-6.091***	-6.117***	-6.218***
Critical Values 1%	-3.589	-4.181	-2.619	-3.770	-3.589	-4.181	-3.592	-4.186	-2.621	-3.770	-3.592	-4.186
Critical Values 5%	-2.930	-3.516	-1.948	-3.190	-2.930	-3.516	-2.931	-3.518	-1.948	-3.190	-2.931	-3.518
Critical Values 10%	-2.603	-3.188	-1.612	-2.890	-2.603	-3.188	-2.604	-3.190	-1.612	-2.890	-2.604	-3.190

Source: Author's computation based on Eviews 9
*Notes: *, ** and *** denotes stationarity at 10%, 5% and 1% significance levels respectively*

The results reported in Table 5.1 show that all the variables are non-stationary in levels irrespective of the type of the stationarity test, except for inflation that was only stationary at 10% level of significance when PP test was used. This is shown by the calculated test statistics which are lower in absolute terms than the critical values. Since not all the variables are stationary in levels, the next step is to difference the non-stationary variables once in order to perform stationary tests on differenced variables.

When all the variables are differenced, they became stationary as indicated by the value of their respective test statistic which is greater than the critical values. The results indicate that the variables are stationary in first difference. The results are consistent in all the tests used. The ADF, DF-GLS and PP tests reject the null hypothesis of non-stationarity for all differenced variables and concludes that all variables are stationary and are integrated of the same order I(1).

5.3 Co-integration Tests Results

Since it has been established that the variables under consideration are stationary after first difference and are integrated of the same order, this study proceeds to perform a co-integration test. The test will determine if there is a long-run relationship between government expenditure and its determinants. This study employs the Johansen-Juselius technique to determine if there is a long-run relationship between government expenditure and its determinants. The technique uses the trace statistic and the max-eigenvalue test statistic to determine the number of co-integrating vectors. If it is established that the variables are co-integrated, an ECM will be estimated in order to determine the short-run dynamics. Table 5.2 shows the results of the Johansen-Juselius co-integration test based on the trace test and on the maximum eigenvalue

Table 5.2: Johansen-Juselius Co-integration Test Results

Panel A: Trace Statistic					Panel B: Maximum Eigenvalue Statistic				
Null	Alternative	Trace Statistic	95% Critical Value	Prob.**	Null	Alternative	Max-Eigen Statistic	95% Critical Value	Prob.**
r = 0	r ≥ 1	232.344	159.530	0.000	r = 0	r = 1	74.407	52.363	0.000
r ≤ 1	r ≥ 2	157.937	125.615	0.000	r ≤ 1	r = 2	50.403	46.231	0.017
r ≤ 2	r ≥ 3	107.534	95.754	0.006	r ≤ 2	r = 3	37.543	40.078	0.094
r ≤ 3	r ≥ 4	69.991	69.819	0.048	r ≤ 3	r = 4	27.562	33.877	0.235
r ≤ 4	r ≥ 5	42.429	47.856	0.147	r ≤ 4	r = 5	20.287	27.584	0.322
r ≤ 5	r ≥ 6	22.142	29.797	0.291	r ≤ 5	r = 6	14.128	21.132	0.355
r ≤ 6	r ≥ 7	8.014	15.495	0.464	r ≤ 6	r = 7	6.815	14.265	0.511
r ≤ 7	r ≥ 8	1.199	3.841	0.273	r ≤ 7	r = 8	1.199	3.841	0.273
Trace test indicates 4 co-integrating equations at the 0.05 level									
Max-eigenvalue test indicates 2 co-integrating equations at the 0.05 level									
**MacKinnon-Haug-Michelis (1999) p-values									

Source: Author's computation based on Eviews 9
Notes: r stands for the number of co-integrating vectors

The trace test and the maximum eigenvalue test statistic reject the null hypothesis of no co-integration if the test static is greater than the critical value. Both the trace statistic and the maximum eigenvalue test reject the null hypothesis of no co-integration at the 5% level of significance. This is confirmed by the calculated trace statistic and the max-Eigen statistic that have been found to be greater that the critical value. The trace statistic reveals that there are four co-integration equations while the max-Eigen statistic reveals that there are two co-integrating equations at 5% level of significance. This shows that there is a long-run relationship between government expenditure and its determinants i.e. poverty reduction, population growth, urbanisation, national income, inflation rate, trade openness and wage rate.

5.4. Error Correction Model Results

The Johansen-Juselius co-integration test has established that there is a co-integrating relationship. Therefore, the error correction model (ECM) can be estimated. To estimate the ECM, firstly the error correction terms for the government expenditure equation are derived. In the second stage, Hendry and Ericsson (1991) general to specific estimation technique is used. The general to specific estimation technique involves the estimation of the general model and then one-by-one eliminates the insignificant lags of variables until parsimonious results are attained (see also Huang, 1994). The results of the parsimonious model are presented in Table 5.3.

Table 5.3: The Error Correction Model

Dependent variable – lnGE				
Variable	Coefficient	Std. Error	t-Statistic	P-value
C	0.007	0.006	1.160	0.254
$DlnPOV$	0.541**	0.271	1.995	0.054
$DlnURB$	-0.083**	0.037	-2.265	0.030
$DlnPG$	0.109	0.085	1.282	0.209
$DlnY$	-1.786***	0.531	-3.364	0.002
$DlnINF$	-0.010	0.020	-0.505	0.617
$DlnTO$	0.077	0.091	0.852	0.401
$DlnTO_{t-1}$	0.219***	0.082	2.675	0.012
$DlnWR$	0.090***	0.030	2.977	0.005
ECM_{t-1}	-0.552***	0.104	-5.310	0.000

R-squared: 0.59   Adjusted R-Square: 0.48

S.E Equation: 0.04   Sum Sq. resids: 0.05   Durbin-

Watson: 1.88   F-Statistic: 5.30 (0.000)

Normality test   1.40   (0.497)

Heteroscedasticity test   0.79 (0.632)

Serial Correlation   0.09 (0.912)

Source: Author's computation based on Eviews 9
Notes:, ** and *** at 10%, 5% and 1% significance levels respectively*

The results of the ECM reveal that the key determinants that are significantly associated with government expenditure are poverty reduction; urbanisation rate; national income; trade openness lagged one period and wage rate. The study did not find a significant relationship between government expenditure and population growth, inflation rate and trade openness at current period.

Poverty has a positive and significant influence on government expenditure. The results suggest that poverty reduction does have an influence on the level of government expenditure. This implies that a 1% increase in poverty will lead to an increase in government expenditure by 0.54%. The coefficient is significant at 5% which is confirmed by the p-value of 0.054. This means that in South Africa, poverty reduction has an influence on the level of government expenditure. When inequality

continues to grow, poverty will increase and this will lead to more redistribution through transfers of social services and provision of public goods and services. This will lead to an increase in government expenditure. The result of a positive relationship is supported by a study done by Milanovic (2000), who found that countries with high inequality of income redistribute more to the poor.

Demographic factors are also the determinants of government expenditure according to the theory. In the results, there is a negative and significant relationship between urbanisation and government expenditure. This implies that a 1% increase in urbanisation will lead to 0.08% decreases in government expenditure. The negative impact of urbanisation on government expenditure could be attributed to the positive effect of the population moving into urban areas. It could be that the population moving into urban areas are the economically active population who do not depend on the government for basic services such as health, education and security. The coefficient is significant at 5% level which is confirmed by the p-value of 0.030. The results are supported by similar studies that found that urbanisation has a negative influence on the government size (see Zakaria & Shakoor, 2011; Rodrik, 1998).

The results further indicate that national income has a negative and significant influence on government expenditure. However, the result does not support the Wagner's Law theory that national income leads to an increase in government expenditure. This implies that a 1% increase in national income will lead to a 1.79% decrease in government expenditure. The coefficient is significant at 1% which is confirmed by the p-value of 0.002. This implies that government expenditure in South Africa will decrease as the economy develops and become wealthier. The results suggest that as the income per capita increases, the citizens do not put the government under pressure to provide public goods and services. The negative impact could also be attributed to the positive effect of government spending on the development of a country. When a country is developing, income will increase. This could lead to a decrease on the level of dependence on government to provide services such as social assistance and to create jobs. Therefore, the government is not under pressure to increase its government size. The results are supported by similar studies that found that income and government expenditure has a negative relationship (see Robert & Alexander, 1990; Folster & Henrekson, 1999).

There is also a positive and significant relationship between trade openness of previous period and government expenditure. The relationship is consistent with the prior expectations of a positive sign. This implies that a 1% increase in any measures to open the economy will lead to 0.22% increases in government expenditure. The coefficient is significant at 1% level of significance which is confirmed by the p-value of 0.012. Trade openness plays an important role in poverty alleviation and creating job opportunities. When the economy opens, it creates opportunities for people in the country to trade with other countries. The results of the positive relationship between trade openness and government expenditure is supported by previous studies such as Cameron (1978); Rodrik (1998) and Shelton (2007).

The wage rate which is a proxy for the true cost of public service provision indicates that it has a positive and significant influence on government expenditure. This implies that a 1% increase in the wage rate will lead to a 0.09% increase in government expenditure. The coefficient is significant at 1% which is confirmed by the p-value of 0.005. This suggests that the cost of public goods and services is important in determining the level of government expenditure. This is not unexpected as the compensation of employees in South Africa accounts to more than 40% of government expenditure. The result supports Baumol (1967) who indicated that the growth of government expenditure is determined by the cost of public goods and services.

The estimated value of ECM is negative conforming to economic theory and it is statistically significant at 1% level of significance. The coefficient explains the rate at which the previous period disequilibrium of the system is being corrected. The coefficient of 0.552 suggests that the government corrects its previous period disequilibrium at a speed of 55% per year. The government is still struggling to correct the legacy of inequality and poverty left by apartheid. One of the objectives of the South African government is to halve poverty. The continuous increase in the number of dependents on social assistance also leads to the speed of adjustment to be slow. The increase in government spending over the years has not resulted in adequate service delivery, high economic growth and low unemployment rate. This could be the reason the correction of errors from previous years is slow. The significance of the ECM supports co-integration and suggests the existence of a long-run equilibrium relationship between government expenditure and its determinants.

The results show that the R-square is 0.59, implying that 59% of the variation in the determinants of government expenditure is explained by the independent variables. The F-statistic measures the joint statistical influence of the independent variables in explaining the dependent variable. The overall equation is statistically significant as shown by the P-value of the F-statistic which is 0.000.

Three diagnostic tests were carried out in this study. The results are presented in Table 5.3. The tests are serial correlation using the Breusch-Godfrey langrage multiplier (LM) test; heteroscedasticity using the White test; and normality using the Jarque-Bera (JB) test. The diagnostic checks have revealed the suitability of the model. The results reveal that the model is correctly specified and there is no evidence of serial correlation. The residuals are confirmed to be homoscedastic. The residuals are also confirmed to be normally distributed.

5.5 Conclusion

The chapter provided the empirical analysis of the determinants of government expenditure. The ADF, DF-GLS and PP tests were used to test for stationarity. It was concluded that the variables were not stationary in levels; therefore, they were differenced once to make them stationary. This study employed Johansen-Juselius co-integration test to examine the long-run relationship between government expenditure and its determinants in South Africa. The ECM approach was employed to determine relationship between the variables. The results from ECM showed that the coefficient of the error correction term is negative and statistically significant at 1% level of significance. The ECM suggests that the government corrects its previous period disequilibrium at a speed of 55% per year. The results indicate that the key determinants that are negative and significantly associated with government expenditure are urbanisation rate and national income. The key determinants that are positive and significantly associated with government expenditure are poverty reduction; trade openness lagged one period and the wage rate. The study did not find a significant relationship between population growth, inflation rate, trade openness at current period and government expenditure.

CHAPTER SIX : CONCLUSIONS AND POLICY RECOMMENDATIONS

6.1 Introduction

This chapter concludes the study, presents the summary of empirical findings and provides areas of further research. Section 6.2 presents the summary of the study while Section 6.3 provides the summary of empirical findings, conclusions and the recommendations. Finally, Section 6.4 discusses the limitations of the study and areas for further research.

6.2 Summary of the Study

The objective of this study was to investigate the factors that determine government expenditure in South Africa. The study was motivated by the increase in government expenditure since the 1970s. The study pursued two specific objectives to empirically examine the determinants of government expenditure. The first objective was to identify the determinants of government expenditure in South Africa. The second objective was to examine the relative effect of the determinants on government expenditure in South Africa. The study tested three hypotheses. The first hypothesis is that poverty reduction, population growth, urbanisation rate, national income, inflation rate, wage rate and trade openness are the determinants of government expenditure in South Africa. The second hypothesis is that poverty reduction, population growth, urbanisation rate, national income, wage rate and trade openness have a positive impact on government expenditure in South Africa. Lastly, the third hypothesis is that inflation rate has a negative impact on government expenditure in South Africa.

The theoretical literatures reviewed in the study include the Wagner's Law, the Keynesian theory, the Peacock-Wiseman theory and the Musgrave and Rostow theory. The Wagner's Law states that as the economy grows, the government functions and activities also increase. The Keynesians believes in the use of fiscal policies to boost economic growth during recession and government spending is seen as the only source that can move the economy out of recession. Peacock and Wiseman (1961) assumed that government expenditure increases due to the growth in revenue. They also identified displacement effects as the reason for the shift of the demand of public goods and services. Musgrave and Rostow relate the demand for

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public goods and services to the stages of development in the economy. These theories suggest that government expenditure has the tendency to increase as the economy expands. A number of empirical literature studies were also reviewed. These studies identified GDP per capita, government revenue, inflation rate, demographic factors, trade openness and wage rate as possible determinants of government expenditure.

In this study, the relationship between government expenditure and its determinants is examined using the ECM approach. The study used the modified version of the model used by Shelton (2007), Huang and McDonnell (1997) and Fielding (1997) to empirically investigate the determinants of government expenditure. The variables included in the model as determinants of government expenditure include GDP per capita as a proxy for national income, inflation rate, population growth, urbanisation rate, trade openness, poverty reduction and wage rate.

In this study, a number of econometric techniques were employed to determine the relationship between government expenditure and its determinants in South Africa. The ADF, DF-GLS and PP tests were used to test the stationarity of the variables. The Johansen-Juselius co-integration test was used to determine the number of co-integrating vectors. The general to specific estimation technique was used to estimate the ECM. Finally, the diagnostic tests for serial correlation using the Breusch-Godfrey langrage multiplier (LM) test, heteroscedasticity using the White test and normality using the Jarque-Bera (JB) test were conducted.

6.3 Summary of Empirical Findings, Conclusions and Recommendations

The empirical findings of the study reveal that:

1. The unit roots tests conducted indicate that all the variables are found to be stationary after they were differenced once.

2. The Johansen-Juselius co-integration test confirmed that the variables are co-integrated. This means that there is a long-run relationship between government expenditure and its determinants.

3. The findings of this study indicate that poverty reduction has a positive and significant relationship with government expenditure, which suggests that an increase in poverty increases government expenditure. As the relationship

between government expenditure and poverty is positive, the government should create more projects such as Expanded Public Works Programmes (EPWP) targeting all the sectors of the economy in urban and rural areas in order to create job opportunities. This can reduce the number of dependants on social assistance from the government and reduce poverty.

4. The results of the study suggest that urbanisation has a negative impact on government expenditure. The negative impact of urbanisation on government expenditure suggests that the government needs to increase its expenditure in developing rural areas and ensuring that the best education and health services are available. Consequently, people would not move to urban areas due to better infrastructure and to get these services.

5. The results of the study also suggest that national income has a negative and significant influence on government expenditure. This suggests that there is an improvement in the country's economic growth and the lives of its citizens. Therefore, the government should spend less on redistributive policies in order to curb an increase in government expenditure. The study also found that trade openness lagged one period has a positive and significant influence on government expenditure.

6. The results of the study also indicate that government expenditure is positively influenced by the wage rate which is the measure for the cost of public goods and services. Currently, compensation of employees accounts for 40% of government expenditure. The government need to find a way to manage the public sector wage bill in order to reduce government expenditure.

7. Population growth, inflation rate and trade openness at current period were found to have an insignificant influence on government expenditure. This suggests that population growth, inflation rate and trade openness at current period are not significant in determining government expenditure in South Africa.

8. The diagnostic tests conducted showed that the model has no evidence of serial correlation, heteroscedasticity and non-normality of residuals.

6.4 Limitations of the Study and Areas for Further Research

Although great effort and care was taken to ensure this study is analytically defensible, it suffers from a few limitations, just as is the case with many other scientific research studies.

1. One of the limitations is the unavailability of data on some of the key determinants of government expenditure as suggested by theory. As a result, the study used annual time-series data from 1970 to 2014. Perhaps, future studies may expand the time-series data to see if the results will be different.

2. Due to the unavailability of data, some of the variables had to be excluded from the empirical model. In addition, some of the variables were either derived or proxied. As expected, the risk with using derived variables or proxies is that they may not represent the actual variables and may lead to inconsistent results.

3. The empirical model only had 7 explanatory variables. Other determinants of government expenditure could have been included but this was not possible because of few data entries. Future studies may include other determinants such as interest rates, foreign direct investment, exchange rates, political stability and corruption.

4. The study used the ECM based approach to determine the relationship between government expenditure and its determinants. Other studies may use the newly developed techniques such as ARDL bounds testing to see whether they can provide different results.

Although these shortcomings might have affected the empirical findings, it is assumed that their impact is minimal and that they did not significantly altered the theoretical and empirical findings of this study.

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