

**An Empirical Examination of the Relationship Between
Government Spending and Economic Growth in South Africa,
From 1980 to 2011**

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Table of Contents

Abstract	i
Declaration	ii
Acknowledgement	iii
List of tables	
List of figures	
List of Appendices	
Chapter 1: Orientation of the Study	1
1. Orientation of the study	1
1.1 Introduction	1
1.2 Background of the study	5
1.3 Problem statement	9
1.4 Purpose of the study	11
1.5 Research aims and objectives	11
1.5.1 Aims	11
1.5.2 Objectives	12
1.6 Research hypothesis	12
1.7 Significance of the study	12
1.8 Limitations of the study	12
1.9 Definitions of terms	13
1.9.1 Economic Growth	13
1.9.2 Government Expenditure	14
1.9.3 Public Goods	14
1.9.4 Budget Deficit	15
1.9.4 Public Debt	15



1.10 Deployment of the study	15
1.11 Summary	16
Chapter 2: Literature review	18
2.1 Introduction	18
2.1 Introduction to Growth and Expenditure Theories	18
2.2 Theoretical Background	19
2.2.1 The Classical Theory	21
2.2.1.1 Wagner's Law	31
2.2.2 The Keynesian Theory	34
2.2.2.1 The Neo-Classical Theory	39
2.2.3 The Endogenous Growth Theory	41
2.2.3.1 Supply Side Economics	44
2.2.4 Summary	45
2.3 Review of Existing Literature	46
2.3.1 Introduction	46
2.3.2 Support for Adolf Wagner's Law	47
2.3.3 Support for John Maynard Keynes	51
2.3.4 Empirical Evidence for Endogenous Growth	53
2.3.5 Summary	59
2.4 Review Research on Government Spending-Economic Growth Nexus	60
2.4.1 Developing Countries	60
2.4.2 Developed Countries	61
2.4.3 Africa	62
2.4.4 Closing Remarks	64

Chapter 3: The South African Economy	65
3.1 Introduction	65
3.2 Evolution of Economic GDP and GDP Growth in South Africa	68
3.2.1 Economic Growth in South Africa	72
3.2.2 Fiscal Policy in South Africa	75
3.3 Composition of Government Spend in South Africa	82
3.3.1 Size and Growth of Government Spend in South Africa	88
3.3.2 Changes in Composition of Spend in South Africa	89
3.4 Summary	92
 Chapter 4: Research Methodology	 93
4.1 Introduction	93
4.2 Econometric Models	93
4.3 Data Description	94
4.4 Model Description	94
4.4.1 Unit Root Test	95
4.4.1.1 Augmented Dickey-Fuller Test	95
4.4.1.2 Phillips Perron (PP) Test	96
4.4.2 Cointegration Tests	97
4.4.2.1 Engle-Granger Cointegration Test	97
4.4.2.2 Johansen Cointegration Test	98
4.4.3 Error Correction Model	99
4.4.4 Causality Test	99
4.4.4.1 Granger Causality Test	100
4.4.5 Diagnostic and Stability Tests	100
4.4.5.1 Histogram and Normality Tests	101
4.4.5.2 Serial Correlation Tests	101

4.4.5.3 Ramsey Reset and Recursive Estimate CUSUM Tests	101
4.5 Summary	101
Chapter 5: Data Analysis and Interpretation	103
5.1 Introduction	103
5.2 Analysis of Results	103
5.3 Visual Inspection/ Unit Root Tests	103
5.4 Unit Root Test Results	107
5.5 Cointegration Testing	112
5.5.1 Engle-Granger Cointegration Results	112
5.5.2 Johansen Cointegration Results	115
5.6 Estimation of Error Correction (ECM) Model	116
5.7 Granger Causality Results	118
5.8 Diagnostic and Stability Test results	119
5.9 Summary of Results	122
Chapter 6: Conclusion and Recommendation	125
6.1 Introduction	125
6.2 Summary	125
6.3 Conclusions	126
6.4 Policy Implications	127
6.5 Recommendations	127
Bibliography	129
List of Appendices	136

Appendix 1: Data for GDP and Government Expenditure	136
Appendix 2: Data for Gross Capital Formation	137
Appendix 3: ECM Output	138
Appendix 4: Granger Causality Output	138
Appendix 5: Diagnostic and Stability Test Output	139
Appendix 6: Histogram	140

ABSTRACT

The study empirically examines the relationship between government expenditure and economic growth in South Africa, for the period 1980 to 2011. Econometric techniques are applied to test the hypothesis that an increase in government expenditure has increased economic growth. The study examines the causal relationship that exists between government spending and economic growth in South Africa using OLS regression techniques. Secondary data obtained from the SARB is used for data analysis. The results confirm a long-run positive relationship which exists between the two variables under study, and further shows that gross capital formation granger causes economic growth.

Chapter 1

1. Orientation of the Study

1.1 Introduction

The study examines the broad role of the government in the economy, and the different ways in which one can observe this. This attempt investigates the relationship that exists between government expenditure and economic growth in South Africa. This study will also look at how government expenditure affects economic growth in South Africa. In order to achieve this, the study will look at theories on economic growth and government spending. The study will also observe how the composition of government expenditure and economic growth changed over time. The study will also analyse the fiscal policy-growth link in South Africa.

Governments play a large role in most economies of the world, and have done so for most of modern history (Van Den Berg; 2001). The author adds that, a brief review of the past several hundred years makes it clear, however, that the role of government in the economy has changed. Public sector economics is the study of government economic policy (Tresch; 2002). According to the author, the primary goal of public sector economics is to determine whether government policies promote a society's economic objectives. In economics, we study the way in which society chooses to allocate its resources in order to satisfy a multitude of needs and wants, as these resources are both scarce and have alternative use. It is necessary for society to prioritise its needs and ensure that the needs materialize, in a declining order of importance (Black et al; 2008 pg 87). The inability of the market and private sector to meet all the needs of the community, particularly with respect to common needs, has led to the role of the state in the economy becoming increasingly larger through the ages (Smit et al; 1996). This has led to studies that look at the role of the government in the economy.

The relationship between economic growth and the size of the state sector has long been a topic of interest for public policy practitioners and academics alike.

The role of the state has been critical in determining particular economic outcomes (Tobin; 2005). For more than a century, national income and production have been rising in all industrial economies (Nordhaus & Samuelson, 1995). According to the authors, at the same time, in most countries, government expenditure has been rising even faster. The authors add that each period of emergency - depression, war, or concern over social problems such as poverty or pollution - expands the activity of government. After the crisis has passed, government controls the after effects and spending never returns to their previous levels (Nordhaus & Samuelson; 1995).

Fiscal Policy consists of the government's expenditures on goods and services (from pens to fighter-bombers) as well as taxation, and monetary policy consists of controlling the creation of money and the level of interest rates (Backhouse & Bateman; 2006). According to the authors, both of these functions (fiscal and monetary policy) existed in the previous two centuries, but they took on a new life in the twentieth century as part of electoral politics and understood as a means to stabilize the swings in output that constitute the business cycle. Banking policy and government debt had been issues well before the twentieth century, but they had not been conceived of in a '*systematic*' way as the means to achieve economic stability (Backhouse & Bateman; 2006). According to the authors, this revolution bears the name of John Maynard Keynes (1883-1946)¹. The economic role of the state was justified formally for the first time only in 1936 by a British economist John Maynard Keynes who maintained that with the aid of certain policy instruments the government had an effect on total demand and thus on macro-economic equilibrium.

One of the commonly used conventionalized facts of public sector economics is that of "Wagner's Law" ²about the long-run tendency for public expenditure to

¹ John Maynard Keynes introduced the Keynesian model in 1936 (Nordhaus & Samuelson). Keynes's General Theory of Employment, Interest and Money (1936) was about the role of the monetary system in general, and the rate of interest in particular, in causing the overall level of employment in a market economy to fall short of its full potential (Blackhouse & Bateman; 2006)

² Adolph Wagner, a German economist, writing in 1890, formulated a principle called "Law of the Increasing Extension of State Activity" (Chang; Liu & Caudill; 2004), Wagner's hypothesis deals with the growing relative importance of government activity in the national economy and has come to be known as Wagner's Law. Wagner's hypothesis states that as economic activity grows there is a tendency for government

grow relative to some national income aggregate such as GDP. This implies that public expenditure can be treated as an outcome, or an endogenous factor, rather than a cause of growth in national income. On the other hand, Keynesian propositions treat public expenditure as an exogenous factor, which could be utilised as a policy instrument. In the former approach, the causality runs from national income to public expenditure whereas in the latter proposition, causality runs from public expenditure via domestic demand to national income (Afonso & Furceri; 2010). Wagner's Law -the "Law of increasing expansion of public and particularly state activities" is one of the earliest attempts that emphasises economic growth as the fundamental determinant of public sector growth (Loizides; 2004).

Research in this area has in general focused on how economic policies impact on economic growth (Tobin; 2005). According to the author, Keynesian ³theory, for example, indicates that given the existence of idle capacity and other resources, increased government expenditure will increase national income. However, studies by authors such as (Barro; 1991), indicate that a large public sector can impede economic growth. Development theory extensively describes the changing role of the state in economic modernization. Development economists have overall argued for increased government spending to mobilize underutilized resources and capital (Tobin; 2005).

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In South Africa, the Constitution⁴ is the supreme law of the country. Government functions are derived from the constitution, and are structured according to the constitutional distinction between the legislative, executive, and judicial branches of government, as well as the national, provincial and local levels of government (Black et al; 2008). The South African Constitution contains many provisions that directly or indirectly have an effect upon the extent and composition of

activities to increase (Chang; Liu & Caudill; 2004). According to Wagner, rising government expenditure was an inevitable feature of the developing (or industrialising) countries of his time (Black et al; 2008).

³ John Maynard Keynes, (1883–1946) is the latest in a line of great British economists who had a profound influence on the discipline of economics (Friedman; 1997). In 1936, Keynes published his book "General Theory of employment, Interest and Money", (Nordhaus & Samuelson; 1995). In his book, Keynes developed a theory of what causes unemployment, and economic downturns, how investment and consumption are determined, how central banks manage money and interest rates, and why some nations thrive while others stagnate (Nordhaus & Samuelson; 1995).

⁴ The Constitution of the Republic of South Africa, Act No 108 of 1996

government expenditure (Black et al; 2008). According to the authors, these provisions for taxation and government expenditure are basic contours within which budgetary policies of the government is formulated.

In South Africa, general government spending includes the outlays of the national government, provincial governments, local authorities, and extra-budgetary institutions, but excludes the spending of public corporations, such as Telkom, Eskom, and Transnet (Black et al; 2008). Looking at the size and growth of general government resources used and the total amount of resource mobilisation using constant 2000 prices, Black et al; 2008, note that this measure suggests that general government expenditure grew significantly in South Africa since 1960 (Black et al; 2008).

In 1960, real per capita government spending in the Republic of South Africa was R 1,703 at constant 2000 prices. Alm & Embaye (2010) The authors points out that by 2007, real per capita spending had more than tripled to R 7,959, and during the same period, real per capita gross domestic product (GDP) increased from R 15,938 to R 25,414 at constant 2000 prices, or by only 60% (Alm & Embaye; 2010). Thirty years ago, comparative information on economic growth was limited to a small (and biased) sample of countries, and as more and more countries are brought within the scope of the World Bank's World Development Report, for instance, it has become apparent that middle income countries (of which South Africa is one) can regress economically just as easily as they can progress (Fedderke & Simkins). Governments and peoples now understand themselves as engaged in the elusive quest for economic growth (Fedderke & Simkins)

Public spending is widely seen as having an important role in supporting economic growth (Afonso & Furceri; 2010). According to the authors, on one hand a lower level of spending implies that fewer revenues are needed to achieve balanced budgets, which means that lower taxes can be levied, therefore contributing to stimulate growth and employment. On the other hand, while higher level of public spending is often associated with higher growth rates, higher government size, measured as GDP's share of government spending, is associated to lower growth rates (Afonso & Furceri; 2010). It is widely recognized

that public expenditure on infrastructure such as roads, ports or communication systems, public research spending as well as the provision of basic education and medical services raises the economic potential of an economy (Irmén & Keuhnel; 2009). This analysis will look at the broad role of the government in the economy, and the best ways to achieve this.

The relationship between government spending and national output is important for many policy related issues. For instance, recessionary (expansionary) periods impede (enhance) central authorities' abilities to stimulate their economy via fiscal measures unless the share of government spending to GNP increases (reduces) (Kumar et al; 2011). According to the authors, long-run estimates of the relationship between government expenditure and national output would permit the identification of a benchmark against which one can identify the fiscal policy stance adopted by particular governments. The government spending and national output relationship is also relevant for the debate on the sustainability of public finances (Kumar et al; 2011).

1.2 Background of the Study

This study intends to examine the specific role that government has played, and continues to play in economic growth in South Africa. As a starting point, we consider that the concept of economic growth is a very important issue to most economists, and decision-makers (Smit et al; 1996). Identifying determinants of long run economic growth remains central to the South African policy debate (Fedderke & Romm; 2006). According to the authors, numerous contributions have investigated the changing structure of economic growth in South Africa, and addressed the impact of a number of its determinants (Fedderke & Romm; 2006)

In South Africa, the achievement of long-term economic growth is also a national priority. The size of government expenditures and its effect on long-run economic growth, and vice versa, has been an issue of sustained interest (Loizides & Vamvoukas; 2005). Economic growth is extremely important because the bottom line for any economy is its ability to satisfy human wants (Van Den Berg; 2001).

The rate of economic growth during the nineteenth and twentieth centuries was higher than during any other period of history (Van Den Berg; 2001). According to the author, people's standards of living never improved as much or as rapidly as they did over the past two hundred years. The author adds that, in the last two hundred years, real per capita output in the world suddenly grew eightfold. He suggests that the total value of output produced in the world increased more than forty times (Van Den Berg; 2001). Economic growth is often measured in terms of per capita real income or per capita real output (Van Den Berg; 2001).

In the South African economic system, the general principle has been that the function of the state will be limited to the minimum necessary duties that cannot be done by the community. Originally, the government was not designed to solve economic problems, but to maintain political order (Smit et al; 1996). According to the authors, the fundamental sources of government power is its authority, and not, as in the case of businesses, its material assets. In South African politics, there is an increasing awareness that political desires are limited by economic possibilities, this boundary must be determined before, and not after, decisions are made (Smit et al; 1996).

Philosophers since the time of Plato⁵ have debated the role of the state and proposed different approaches to governing a nation (Nordhaus & Samuelson; 1995). According to the authors, in a modern industrial economy, no sphere of economic life is untouched by the government (Nordhaus & Samuelson; 1995).

(Nordhaus & Samuelson; 1995) identify three major instruments or tools that government uses to influence private economic activity, and these are:

- (a) Taxes that reduce private income, thereby reducing private expenditures (on automobiles or restaurant food) and providing resources for public expenditure (on goods like bridges, garbage collections, or smart bombs),
- (b) Expenditures that induce firms and workers to produce certain goods or services (such as tanks, education, or police protection), along with transfer payments (like social security and welfare payments),
- (c) regulations, or controls that direct people to perform or refrain from certain economic activities (Nordhaus

⁵ Greek philosopher

& Samuelson; 1995). Thus, it is for this reason that this study will unpack the impact of government spending on economic growth in South Africa.

This study notes that, every government spends money and raises taxes to finance its expenditure (Mohr; 1995). In addition, every government must therefore regularly decide how much to spend, what to spend it on, and how to finance its expenditure. According to author, governments' must therefore have a policy in respect of the level and composition of government spending and taxation. This is called fiscal policy. Government spending has to be financed in one way or another, and there are three ways of financing government spending – income from property, taxes and borrowing. For most of the seventy years since the publication of the *General Theory*, the phrase 'Keynesian economic policy' has been a synonym for fiscal policy (Mohr; 1995).

Most economies nowadays are classified as mixed economies, in which the government, the private sector and the market all play an important role (Mohr; 1995). The author points out that even Adam Smith⁶ recognised that the government always has a role to play. According to the author, Adam Smith believed, that government's role should be limited to the absolute minimum. However, he did not argue that government should adopt a completely 'hands-off' approach. Adam Smith identified three things, which governments ought to do, and they are:

- The provision of national defence
- The administration of justice
- The provision of certain socially desirable services (such as education)

In the public finance literature, this proposition means that, as per capita income rises, so the share of public sector expenditure increases to meet the increased protective, administrative and educational functions of the state (Ansari et al; 1997). This would imply that economic growth is the cause of growth in

⁶ Adam Smith is generally regarded as the father of the 'market economy' (or free enterprise system) (Mohr; 1995). In 1776 Adam Smith published "An inquiry into the nature and causes of the wealth of nations", or 'The wealth of Nations' (Mohr; 1995). According to the author, Smith transformed the subject of economics into a science, and was the first to provide a detailed intellectual justification for free markets, both domestically and internationally.

government expenditure. More importantly, the authors note that, public expenditure plays no role in economic growth, and therefore, cannot be relied upon, as a policy instrument (Ansari et al; 1997). Wagner argues that expenditure is an endogenous factor or an outcome, not a cause, of growth in national income (Ansari et al; 1997).

Over the years, at least two methodological approaches have characterized the relationship between government expenditure and economic growth. In the first approach, government expenditure is considered endogenous to, or predetermined by, economic growth (Wahab; 2004). According to the author, in the first approach, government expenditure responds positively to changes in growth so that as a country's income rises so does the size of the country's public sector). Therefore, government expenditure is income-elastic with an elasticity coefficient that exceeds unity (Wahab; 2004). The German economist, Adolph Wagner (1890), who set forth 'the law of expanding state expenditures' first introduced this point of view, and justified it by the following considerations (Wahab; 2004). As an economy grows - (a) There will be a need for more administrative and protective functions of the state, (b) A need for increased provision of social, cultural goods, and services. Lastly, (c) an increased need for provision of proper administrative and bureaucratic controls to ensure the smooth operation of market forces.

The second approach that has characterized the relation between government expenditure and economic growth is what has often been termed the Keynesian macroeconomic viewpoint (Wahab; 2004). In such a framework, government expenditure is considered exogenous, or predetermined, to economic growth, with empirical inquiry typically focusing on assessing whether or not government expenditure is causal to economic growth and whether such expenditure is growth-impeding or growth-enhancing (Wahab; 2004). The Keynesian system of ideas is one of the most significant schools of economic thought (Grant & Brue; 2006). The crux of the Keynesian approach is that the explanation of changes in production and income is to be found in fluctuations in total expenditure in the economy (Fourie; 1997). According to the author, total expenditure is at the heart of the action. Therefore, this means that in essence, the basic Keynesian model

is expenditure, or demand determined model. The basic thrust of the Keynesian approach is to understand, explain and anticipate the behaviour of total expenditure. This is done by dividing total expenditure into different components of expenditure. (i.e. $\text{Total expenditure} = C + I + G + (x - m)$) (Fourie; 1997)

The Keynesian proposition treats public expenditure as autonomous and exogenously given. Here the causation runs from growth in government expenditure to growth in national income (Ansari et al; 1997). More importantly, public expenditure becomes a policy variable that can be used to influence economic growth. Relying on this proposition, many developing countries have assigned to their public sector the role of promoting growth and economic development (Ansari et al; 1997).

Based on the literature, it is clear to see that this issue is quite important to many economists and governments. It is for this reason that the study will attempt to unpack the problem in a South African context.

1.3 Problem Statement

In the 2012 National Budget Speech, The Minister of Finance announced that national spending would exceed R1.1 Trillion for the first time in history (Budget Speech 2012). The Minister outlined that this was about 32% of GDP. According to the Director General of the National Treasury, Mr. Lungile Fuzile, this measure was in response to the global recession, and the government hiked its spending to keep South Africa afloat and prevent it from sinking into a deep hole. It is for this reason that this study intends to analyze the relationship between government spending and economic growth in South Africa.

In South Africa, there is growing literature that indicates that the relationship between public expenditure and growth is more complex, and that it is necessary to differentiate between the various components of government expenditure. Studies by (Fedderke; Perkins; & Luis: 2006) find that investment in infrastructure does appear to lead economic growth in South Africa and does so both directly

and indirectly. The results of a study by (Ziramba, 2008) find a long-run relationship between real per capita government expenditure and real per capita income. In addition, causality test results show evidence of bidirectional causality. Therefore, based on empirical results in that study, the author concludes that Wagner's law finds no support in South Africa.

The relationship between government expenditure and economic growth has received a lot of attention in several studies including (Aron, & Muellbauer, 2007; Wu et al, 2010; Loizides, & Vamvoukas, 2004; Hsieh, & Lai, 1994; Kumar et al, 2011; and Chang et al, 2004). Even more research has been done on the impact that government spending has on economic growth. Studies like, (Akitoby et al. 2006) find that a positive and significant relationship exists between the variables, while studies like (Nketiah-Amponsah; 2009; Barro; 1991), find that government spending retarded economic growth.

In a study by (Ansari et al; 1997), three African countries (Ghana, Kenya and South Africa) are chosen for their empirical analysis. The emphasis is on developing countries because of the authors' interests on the role of government expenditure in promoting growth and development. The data used in testing represents annual per capita government expenditure and gross national product (national income) for Ghana (1963-1988), Kenya (1964-1989) and South Africa (1957-1990). The results of the study show that, the Keynesian proposition of government expenditure as a policy instrument to encourage and lead growth in the economy, is not supported by the data for these three African countries. Second, in the short run, of the three African countries, only Ghana showed evidence of government expenditure, being caused by national income. In other words, this supports Wagner's hypothesis as to the role of government expenditure as an endogenous factor of economic development (Ansari et al; 1997). And in another study by Dockel & Seeber (1978), they partially confirmed the relevance of Wagner's law for South Africa (Black et al; 2003). According to the authors, they found high income elasticities for most categories of government spending, which implies that government expenditures 'increase more than proportionally with economic growth'. It is for this reason that I have decided to study the impact of government spending on economic growth in

South Africa. This study intends to find out how government spending affects growth in South Africa. The study will find out if there is a positive or negative relationship between the variables under study, and determine a policy position for South African decision makers.

1.4 Purpose of the Study

This study is important firstly because of the nature of the relationship between government expenditure and economic growth. The study is also significant, because other studies observed contrasting results on the relationship between government expenditure and economic growth.

1.5 Research Aims and Objectives

The overall aim of this study is to analyse and determine the relationship that exists between government spending and economic growth in South Africa. The study asks whether an increase in government expenditure, will result in an increase in GDP growth and/or GDP per capita. The study also aims to find if causality exists between government expenditure and economic growth in South Africa during the period 1980 – 2011.

1.5.1 Aims

The following are the study's main aims and objectives:

- The study aims to investigate empirically the relationship that exists between government expenditure and economic growth in South Africa.
- To determine the direction of causality between government expenditure and economic growth if it exists
- To highlight that government expenditure must be directed toward activities and initiatives that promote and accelerate economic growth

1.5.2 Objectives

To achieve the aims, the following objectives were set.

- To emphasise the evolution of GDP and GDP growth in South Africa
- To discuss the growth of government spending in South Africa
- To show the changes in the composition of government spending in South Africa

1.6 Research Questions/ Hypothesis

H₀: The increase in government expenditure has increased economic growth

H₁: The increase in government expenditure has not increased economic growth

1.7 Significance of the Study

This attempt is important firstly because of the nature of the relationship between government expenditure and economic growth. The analysis is also significant, because other studies observed contrasting results on the relationship between government expenditure and economic growth. This undertaking intends to add to the body of literature on the measurement and treatment of government expenditure and economic growth. The results of the analysis will assist policymakers find suitable ways of stimulating economic growth. The study is vital because it studies the relationship in a South African perspective that will aid local policymakers.

1.8 Limitations and Delimitations of the Study

The lack of research carried out in South Africa on the causal relationship between government expenditure and economic growth, as well as relevant South African literature, is a limitation to the study. The analysis uses secondary

data, for the period 1980 to 2011. Our study, is limited to the South Africa economy, and does not study other countries.

1.9 Definition of Terms

In order to ensure that our terms of reference are clear, the study will use the following broad definitions. These definitions will aid in explaining some of the concepts under study.

1.9.1 Economic Growth

Economic growth involves increasing the capacity of the economy to satisfy the wants and needs of its inhabitants (Van Den Berg; 2001). The author defines economic growth as 'growth in human welfare'. The author adds that the only meaningful way to study economic growth is to focus on how and why individual welfare changes over time. Economic growth is the single most important factor in the economic success of nations in the long run (Nordhaus & Samuelson; 1995). The authors view economic growth as representing the expansion of a country's potential gross domestic product (GDP) or output. Economists typically measure a country's growth in output per person over 10-year or 20-year periods, in order to remove the temporary difficulties of recessions and booms, and give a better idea of the long-term trend. Economic growth refers to an increase in GDP, in a developed country with already established production patterns. It pertains to the growth of already existing factors such as capital, labour and technology (Smit et al; 1996).

Economic growth is defined as an increase in a country's production in a given period, or as the yearly increases in goods and services (Smit et al; 1996). Economic growth is one of the most important objectives for economic policy. The growth rate of a country is usually synonymous with the rate at which the real GDP changes. GDP usually grows by a few percentage points a year for

developed economies. Developing economies can grow much faster in the long-term (Smit et al; 1996).

Economic growth is one of the most important objectives for economic policy (Nordhaus & Samuelson; 1995). The authors define economic growth as a representation of the expansion of a country's potential gross domestic product (GDP) or output. According to (Nordhaus & Samuelson; 1995), economic growth occurs when a nation's production-possibility frontier (PPF) moves outward.

1.9.2 Government Expenditure

As the single largest economic entity in the country, by a wide margin, government spending plays a pivotal role in determining the pattern of expenditure (Nordhaus & Samuelson; 1995). Government expenditure concerns the purchases of goods and services by the general government. This may vary from pencils to roads to policing services to army tanks. A large portion of government spending goes towards the payment of wages and salaries of public servants (Fourie; 1999). General government in South Africa comprises the central government, provincial governments, as well as local governments (municipalities) (Fourie; 1999).

1.9.3 Public goods



In economics, a public good is a good that is non-rivalrous and non-excludable. Non-rivalry means that consumption of the good by one individual does not reduce availability of the good for consumption by others; and non-excludability means that, no one can be excluded effectively from using the good. In the real world, there may be no such thing as an absolutely non-rivalrous and non-excludable good; but economists think that some goods approximate the concept closely enough for the analysis to be economically useful (www.wikipedia.org)

1.9.4 Budget Deficit

A budget deficit is incurred when expenditures exceed taxes (Nordhaus & Samuelson; 1995). The budget deficit is defined as the excess of government expenditure over revenue, and is the most widely used fiscal indicator (Abedian & Biggs; 1998). A government budget deficit is the amount by which some measure of government revenues falls short of some measure of government spending (Wikipedia.org). As one of the key indicators of fiscal stance, the budget deficit is often subjected to intense scrutiny and economic commentary (Abedian & Biggs; 1998). According to the authors, unless interpreted with caution, the budget deficit could give rise to misleading impressions of fiscal-policy stance, and erroneous policy prescriptions (Abedian & Biggs; 1998). Budget deficits can influence growth in two ways: through their effect on resource utilization and through their effect on the rate of capital accumulation (Abedian & Biggs; 1998).

1.9.5 Public Debt

Public debt may be defined as the sum of all the outstanding financial liabilities of the public sector in respect of which there is a primary legal responsibility to repay the original amount borrowed, and to pay interest (Black et al; 2011). Accumulated budget deficits over time lead to public debt, and public-debt management is one of the central tasks of fiscal policy (Abedian & Biggs; 1998). The government debt (sometimes called public debt) consists of the total or accumulated borrowings by the government (Nordhaus & Samuelson; 1995). Public debt arises primarily from the government's annual budget deficits (Black et al; 2011).

1.10 Deployment of the Study

The study consists of six chapters, as detailed below:

Chapter 1 outlines how the study is going to be treated. It explains in full detail the background of the study and the historical literature about the variables under study. It explains the research hypothesis used in treatment of the variables,

shows the significance of the study, explains the research methodology, defines terms, and shows how the study is deployed.

Chapter 2 reviews the literature on government spending and economic growth, and lays the theoretical foundation needed for careful analysis of the variables under study. The chapter also reviews the important models needed in the analysis. A solid theoretical background is laid in this section.

Chapter 3 gives us a detailed account of the South African economy. It touches on the evolution of GDP and GDP growth in South Africa, and details the composition of government spend in the Republic of South Africa. It gives a historic and country specific perspective of the variables under study.

Chapter 4 unpacks the research methodology, and details how the dependent and independent variables are analyzed. This chapter introduces the simple regression model that is used to analyze data. The models are described and explained in this section

Chapter 5 is the actual analysis of data obtained for close examination. This chapter uses the analysis results and interprets, and draws conclusions about the study.

Chapter 6 furnishes us with the empirical findings, recommendations, and conclusions to the study

1.11 Summary

Government spending and economic growth have been issues that have been occupying the minds of economists for more than a century. South Africa, like many developing countries, is faced with huge challenges, which include high unemployment, inflation, poverty, inequality, and many others. There is disagreement on whose responsibility it is to create jobs and grow the economy. Some believe that it is the responsibility of the South African government to make

certain that the citizens of the country enjoy the benefits of the new dispensation. In the past seventeen years under democracy, it has become evident that in many parts of the country, growth and development are still lacking. It is our role, as analysts to undertake research that will aid in the development of the country. It is for this reason that this study aims to find the impact that government spending has on the economic growth of the country.

Chapter 2

2. Literature Review

This chapter introduces the literature review on the government expenditure - growth nexus. The literature review part has five sections, namely: introduction to growth and expenditure theories, theoretical background, review of existing literature, review research on countries, and the summary. The first two sections will re-examine the theoretical foundations of government spending and economic growth. The two sections will consider the different schools of thought throughout history, and introduce those specific theories, which link our study with the theory. The following two sections will examine the existing research literature on the fiscal policy growth nexus, and look specifically at country specific research. The last section will put everything into perspective and give a summary.

2.1 Introduction to Growth and Expenditure Theories

In this section, we are going to take a closer look at the existing economic theory we have in the world. Theories are important because they give us a historical perspective from which we can learn and build on.

Theoretically, there are two competing school of thought defining this relationship (Tang; 2009). First, Adolf Wagner (1890) postulated that government spending is an endogenous variable and grows faster than income growth. Moreover, government spending is a consequence rather than cause of economic growth. According to the author, Wagner's Law viewed that government spending plays no role in generating economic growth, hence the causality direction runs from economic growth to government spending. However, John Maynard Keynes (1936) argued that government spending is an exogenous variable and used to generate economic growth. For this reason, government spending is a cause rather than effect of economic growth. Therefore, the causal relationship should run from government spending to economic growth (Tang; 2009). For the

purpose of our analysis, we include another school of thought. This will help enhance our theoretical understanding of the variables under study. The other school of thought for our consideration and analysis will be the Endogenous growth theory. Endogenous growth theory places particular importance on externalities. These externalities arise either as public goods, such as investments in human capital and research and development, or as private goods where firms are able to exploit economies of scale. The importance of education and human capital has been examined in many recent studies of economic growth (Van Den Berg; 2001). According to (Van Den Berg; 2001), Robert Lucas developed one of the first endogenous growth models in the late 1980s by specifying education as the critical force that generates technological progress in an economy. According to (Van Den Berg; 2001), the model shows that education and the creation of human capital could be responsible for both the differences in labour productivity and the differences in overall levels of technology that we observe in the world.

2.2 Theoretical Background

Macroeconomics is subject to changing fashions and beliefs. The rapid change of fashions in macroeconomic theory is in part, explained by the interaction of events and ideas (Fourie; 1999). The scope of government control of the economy has been a political battleground for centuries. Today, liberals want government to correct flaws in the market mechanism and alleviate social problems for the disadvantaged. Conservatives demand that governments 'get off our backs' so that marketers can work their miracles in raising everybody's living standards (Nordhaus & Samuelson; 1995). According to (Van Den Berg; 2001), we might argue whether the most 'successful economy is the one that provides its citizens with the highest levels of welfare, or the one that improves (increases) their welfare at the most rapid rate, but undeniably, the success of an economy is in some way directly related to human welfare.

Markets have proved a mighty engine for powering the economies of industrial countries, over the last two centuries. Nonetheless, about a century ago,

governments in virtually all countries of Europe and North America began to intervene in economic activity to correct the perceived flaws in the market place. The increase of government involvement has brought a vast increase in the influence of the state over economic life (Nordhaus & Samuelson; 1995).

In order that we understand the current dynamics in economics, we need to review some of the important lessons learnt from the past. There are differing schools of thought with regard to our analysis and they include, but are not limited to Mercantilism, Classical, Keynesian, and Neo-classical, Monetarism, and Endogenous growth. For the purpose of our study, the study will focus on Classical, Keynesian, and Endogenous Growth theories.

Before Adam Smith⁷, the predominant school of thought was Mercantilism⁸, and it originated against the background of the medieval Laissez Faire ⁹environment. During the middle Ages, towns became increasingly important, and trade between towns flourished. The discovery of gold in the western hemisphere facilitated growing volumes (Smit et al; 1996). Important geographical discoveries expanded the sphere of commerce; production increased, and emerging national states exercised their influence. National states were rising, and the most powerful of them were acquiring colonies (Grant & Brue; 2006). According to the authors, it is not surprising, then, that a body of literature evolved, that superseded feudal concepts, promoted nationalism, gave new dignity and importance to the merchant, and justified a policy of economic and military expansion (Grant & Brue; 2006). Some of the characteristics of Mercantilism include the following:

- The prosperity and wealth of nations was measured by the gold and silver it possesses

⁷ Known as the father of economics, Adam Smith was a forerunner of public choice theory and the theory of economic regulation. He published the book *"An enquiry into the Nature and Causes of the Wealth of Nations"* in 1776, the year of the American Revolution (Smit et al; 1996).

⁸ This school of thought originated against the background of medieval thinking. Mercantilism can be dated roughly from 1500 to 1776 (Grant & Brue; 2007)

⁹ Laissez faire is economic liberty or freedom. This doctrine, translates as "leave us alone" held that governments should interfere as little as possible in economic affair and leave economic decisions to the interplay of supply and demand in the marketplace (Mohr; 1995).

- Nationalism led to militarism. Exports had to be encouraged at the expense of neighbouring colonies. Only powerful nations could take possession of colonies, dominate trade routes, win wars and participate successfully in international trade.
- Raw materials that were not at home were imported duty-free. Manufactured goods and raw materials that are produced domestically were protected, and export restrictions were placed on raw materials.
- Restrictions on imports, however, reduced the availability of consumer goods at home.
- A strong central government was necessary to achieve mercantilist goals. Mercantilists did not trust their own judgement and honesty. The result was a bewildering number of rules and regulations for controlling the production of goods (Nordhaus & Samuelson; 1995)
- Colonization and monopolization of colonial trade. Merchant capitalists favoured colonization and wanted to keep the colonies eternally dependent

A lasting contribution made by mercantilists was that they emphasised the importance of international trade and developed the economic notion of the balance of payments (Nordhaus & Samuelson; 1995). The Mercantilists also contributed indirectly to economics and economic development by influencing attitudes toward the merchant, promoting nationalism and bringing in new products, producing outlets for manufacturing goods, and furnishing incentives for the growth of capital investment.

2.2.1 The Classical Theory

Since the dawn of economics two centuries ago, one of the deepest controversies has concerned whether or not the economy has a tendency to move spontaneously toward long run, full-employment equilibrium without the need for government intervention. Using modern language, we label as 'classical' those approaches that emphasize the powerful self-correcting forces in an

economy; Classical economics has its roots in the writings of Adam Smith (1776)¹⁰, J.B Say (1803), and John Stuart Mill (1848) (Nordhaus & Samuelson; 1995). Adam Smith made the most important contribution from the classical school of thought, when he published the book "An Inquiry into the Nature and causes of the Wealth of Nations".¹¹ This book established economics as an autonomous subject and launched the doctrine of free enterprise upon an unsuspecting world (Smit et al; 1996). The central theme that inspires the book, is the notion that selfishness, however morally reprehensible, may nevertheless provide a powerful fuel to a 'commercial society' (Blaug; 1997). According to the author, Smith had caught sight of the fact that under certain social arrangements, which we would nowadays describe as 'workable competition' private interests are harmonised with social interest as if by an "invisible hand". The 'invisible hand' doctrine applies to economies in which all the markets are perfectly competitive (Nordhaus & Samuelson; 1995). According to the authors, in such a circumstance, markets will produce an efficient allocation of resources, so that an economy is on its production-possibility frontier.

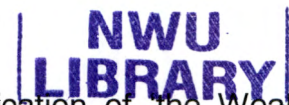
Adam Smith recognised that the virtues of the market mechanism are fully realised only when the checks and balances of perfect competition are present (Nordhaus & Samuelson; 1995). The author adds that, when all industries are subject to checks and balances of perfect competition, markets will produce the efficient bundle of outputs with the most efficient techniques and using the minimum amount of inputs. However, the authors note that, there are many ways in which markets fail to be perfectly competitive. The three most important involve imperfect competition, such as monopolies; externalities, such as pollution; and public goods¹², such as national defense and highways (Nordhaus & Samuelson;

¹⁰ Adam Smith was a forerunner of public choice theory and the theory of economic régulation (Smit et al; 1998)

¹¹ The book is the first full-scale treatise on economics, containing as it does a solid core of production and distribution theory, followed by a review of the past in the light of these abstract principles, and concluding with a battery of policy applications (Blaug; 1997).

¹² Public goods are those goods that once they are available to one person, they are available to everyone (Lois Duff; 1997). Public goods suffer from the 'free-rider' problem. A free-rider is an individual who consumes a good without paying for it (Lois Duff; 1997).

1995). According to the authors, in each case, market failure ¹³leads to inefficient production or consumption, and government can play a useful role in curing the disease. Some economists contend that market failure does not necessarily provide sufficient grounds for government intervention (Mohr & Fourie; 2004). According to the authors, these economists argue that, even though the market may fail to achieve the best possible outcome (in terms of efficiency), the government intervention will tend to worsen the situation, rather than improve it. The authors add that, in other words, most economists maintain that the problems created by government intervention are greater than the problems overcome by that intervention.



(Van Den Berg; 2001) points out that, with the publication of the *Wealth of Nations*, in 1776. Adam Smith insisted that the wealth of a nation is determined not by the amount of gold in the national treasury, the size of its navy and army, or even the success of some of its industries, but by how many goods and services can be acquired by its entire population. Smith's ideas on the value concept, divisional theory and economic liberalism (*laissez-faire*) are treated. Under the value concept, labour is the most important factor with which to determine value. Value (utility and trade) is determined not only by usefulness to man, but also by scarcity. The labour required for the production of an article determines the natural price, whereas the interaction between supply and demand determines the market price (Mohr & Rogers; 1998). Although the market price can be higher than the natural price, the price will always return to the natural price because of competition. Under divisional theory, the author explains that in primitive society, all of the production output goes to labour, while in developed communities labour and the capitalist each receive a share (Mohr & Rogers; 1998). Labour must receive at least enough to survive, according to the early capitalist view that the entrepreneur had to be the provider of capital as well as management. The capitalist does not distinguish pertinently between the function of capital and the function of enterprise. For the capitalist, there is no distinction between profit and interest (Mohr & Rogers; 1998).

¹³ Market failure occurs when the market system is unable to achieve an efficient allocation of resources (Mohr & Fourie; 2004). The authors note that market failure does not mean that nothing good has happened, but rather that the *best available outcome* has not been achieved

Adam Smith singled out one of the key characteristics of growing economies, namely, the increasing specialization of individual economic activity (Van Den Berg; 2001). According to the author, Smith's appreciation for the gains from specialization, or 'division of labour', led him directly to the concept of absolute advantage, which is very close the basic principle of trade, '*comparative advantage*'. This principle prescribes that every nation should concentrate on doing what it does best, rather than seeking to do a little bit of everything for itself (Van Den Berg; 2001). Adam Smith also described the phenomenon we now call 'economies of scale', which states that a given amount of productive resources result in more output when they are brought together in a single large production facility, rather than being spread among a large number of small production units (Van Den Berg; 2001)

According to Adam Smith, "It is not from the benevolence of the butcher, brewer, or the baker, that we expect our dinner, but from regard to their own interest' (Blaug; 1997). Adam Smith believed that the actions of every individual are aimed at maximising own interest, thereby unintentionally promoting community interests too.

Adam Smith limits the proper functions of government to - the safeguarding of property rights, the provision of national defence and the maintenance of certain public works. According to (Blaug; 1997) Smith notes that the state has 'three duties of great importance, and they are as follows:

- The provision of military security
- The administration of justice, and
- The duty of erecting and maintaining certain public works, and certain public institutions, which it can never be for the interest of any individual, or small number of individuals.

Adam Smith favoured state aid in providing school buildings, meaning aid from local government (Blaug; 1997). This is a clear link with our study. According to the author, Adam Smith similarly argued that the greater part of the expense of

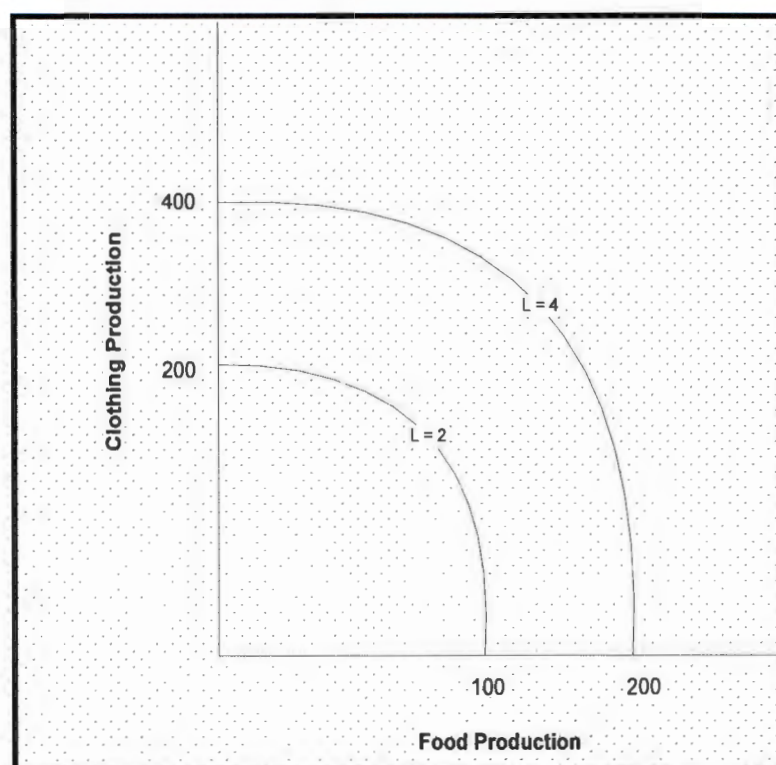
public works, such as highways, bridges, canals and harbours, should be met out of appropriate tolls on the users of these services, with the remainder coming out of local revenue when the benefits were local, and only otherwise out of general revenue (Blaug; 1997). This theory is applicable to our study, since the study examines the broad role of the government in the economy.

Smith and the classical school had a profound influence on the development of economics as an academic science, In addition, on economic practice (Abedian & Biggs; 1998). The classical school left two revolutions to run free, according to (Nordhaus & Samuelson; 1995), and they are the scientific revolution, and the industrial revolution. The scientific revolution resulted in people no longer simply accepting everything (Nordhaus & Samuelson; 1995). Both the industrial revolution and the classical political economy originated in England. By 1776, England was profiting greatly from international trade. English entrepreneurs grew stronger, and no longer depended on state subsidies, monopolies, other benefits, and tariff protection. Competition stimulated good prices and quality products. An underpaid, hard-working labour force emerged, where workers were occasionally protected, but more often than not, the employers benefitted at the expense of the workers (Smit et al; 1996).

Modern proponents of the classical view hold that the private economy is inherently stable and that most, if not all, business cycles have been the result of faulty government policy. For instance, (Friedman & Schwartz; 1962), have argued that changes in the money stock were the dominant causes of business cycles in the United States (Mohr & Rogers; 1998), and that these cycles were predominantly exogenous in the sense that the fault lay with the monetary authorities, who did not understand the workings of monetary policy, according to the authors. According to the classical view, natural economic forces in industrialised market economies tend to generate stable economic growth and deviations from this stable trend are due to exogenous forces, including inappropriate monetary and fiscal policy. The major policy conclusion is that the best policy would be to leave the private economy to its own devices, and to let 'market forces' sort out the economic problems of the day.

Unlike growth theorists today, early economists like Adam Smith and Thomas Malthus¹⁴ stressed the critical role of land in economic growth (Nordhaus & Samuelson; 1995). According to the authors, the early nineteenth-century British economist, Adam Smith, in 'The Wealth of Nations (1776)', provided a handbook of economic development. Smith begins with a hypothetical situation that precedes both the appropriation of land and the accumulation of (capital) stock - where land is freely available to all, and before capital accumulation had begun to matter (Nordhaus & Samuelson; 1995). Because there is no capital, national output exactly doubles as population doubles, as in Fig 1(a).

Figure 1(a) Smith's Golden Age



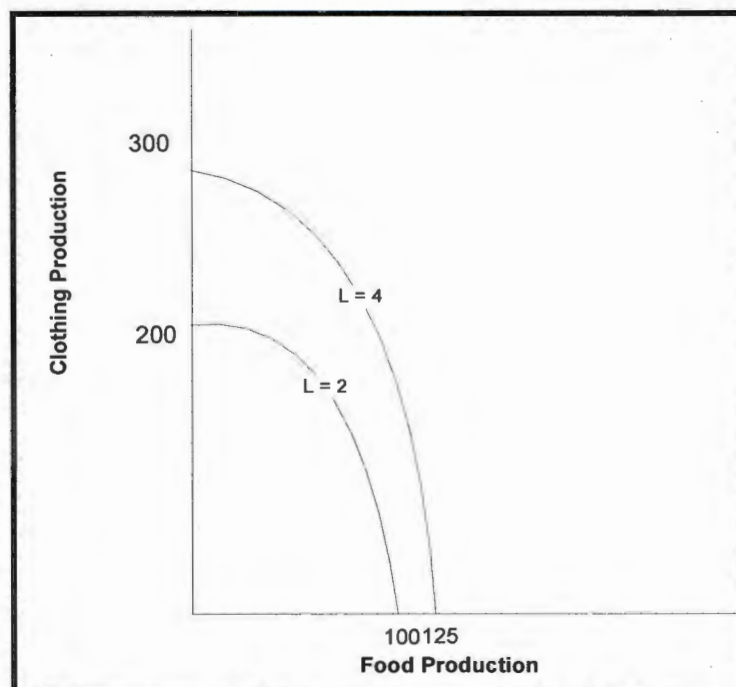
Wages earn the entire national income because there is no subtraction for land rent or interest on capital. Output expands in step with population, so therefore the wage per worker is constant over time (Nordhaus & Samuelson; 1995).

¹⁴ Robert Malthus was not the first person to speculate about demographic problems, but he was the first to succeed in devising a *theory* of population growth (Blaug; 1997). The Malthusian theory of population focused attention on the limited supply of land. Among its by-products was the concept of diminishing returns, and more surprisingly, a theory of the nature of ground rent (Blaug; 1997).

Figure 1(a) shows the process of economic growth in Smith's golden age. As population doubles, the production-possibility frontier (*PPF*) shifts out by a factor of two (2) in each direction, showing that there are no constraints on growth from land or resources. In Fig. 1(a), unlimited land on the frontier means that when population doubles, labour can simply spread out and produce twice the quantity of any food and clothing combination.

Figure 1(b) shows the pessimistic Malthusian case, where a doubling of population leads to a less-than-doubling of food and clothing, lowering per capita output, as more people crowd onto limited land and diminishing returns drive down output per person (Nordhaus & Samuelson; 1995). In Fig. 1(b), limited land means that increasing population from 2 million to 4 million triggers diminishing returns. Note that potential food production rises by only 25percent with a doubling of labour inputs.

Figure 1(b) Malthus' Dismal Science



According to (Nordhaus & Samuelson; 1995), Malthus' forecast was dramatically wide of the mark because it did not recognize that technological innovation and

capital investment could overcome the 'law of diminishing returns' (Nordhaus & Samuelson; 1995). According to the authors, land did not become the limiting factor in production; instead, the Industrial Revolution brought forth power-driven machinery that increased production. Factories gathered teams of workers into giant firms, railroads and steamships linked together the far points of the world, and iron and steel made stronger machines and faster locomotives.

Another of the Classic economists is JB Say¹⁵, who denied that the level of spending in an economy could be too low to bring about the purchase of the entire full-employment output (Van Rensburg et al; 2011). According to the authors, J.B Say believed that the production of any output automatically provides the income needed to buy that output. This theory, according to (Nordhaus & Samuelson; 1995), and propounded in 1803 by J.B. Say, states that overproduction is impossible by its very nature. This rationale is expressed today as "supply creates its own demand" (Nordhaus & Samuelson; 1995).

The theory rests on a view that there is no essential difference between a monetary economy and a barter economy – that whatever factories can produce, workers can afford to buy. In the classical view, changes in aggregate demand affect the price level but have no lasting impact upon output and employment. Price and wage flexibility ensures that the real level of spending is sufficient to maintain full employment (Nordhaus & Samuelson; 1995). Say's Law can also be understood in terms of a barter economy (Van Rensburg et al; 2011). According to the authors, a woodworker, for example, produces or supplies furniture as a means of buying or demanding the food and clothing produced by the other workers. The authors add that the woodworker's supply of furniture

Although there are many versions of Say's Law, it is usually presented as the proposition that "supply creates its own demand", and like most laws in economics, it reflects an idea that contains an element of truth. However, it is not the whole truth and if analysis is based on a belief in Say's Law, it can go seriously wrong. The basic idea underlying Say's Law is that production, by

¹⁵ Jean Baptiste Say (1767-1832) was a French economist whose simple idea was that the very act of producing goods generates income equal to the value of the goods produced (Van Rensburg et al; 2011)

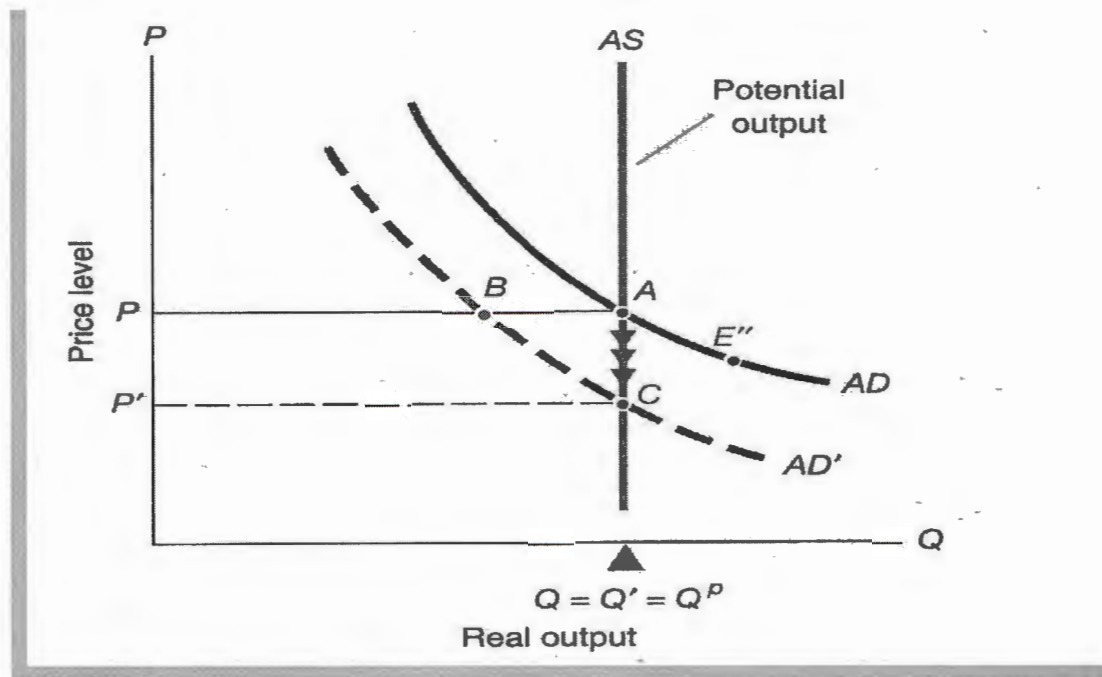
creating income simultaneously creates the necessary means to purchase that output. Moreover, since the willingness to work, is motivated by the desire to consume, there should be no limit to the sale of any volume of output. Hence, there is no reason for unemployment, as output should expand to the point where the labour force is fully employed in the long run. In classical economics, unemployment is a short-run, temporary phenomenon (Mohr & Rogers; 1998)

The *quantity theory of money* then complemented Say's law by providing an explanation of the price level. With full employment ensured in the long run and velocity stable and changing only slowly over time as financial institutions evolved, the price was seen to be determined by the quantity of money. The quantity theory and Say' Law then led inevitably to the conclusion that money is neutral in the sense that, in the long run, an increase in the money stock would cause an increase in the price level only, without any increase in output (Mohr & Rogers; 1998).

The classical view has two conclusions that are vitally important for economic policy. To begin with, under the classical view, the economy has only brief and temporary lapses from full employment and full utilization of capacity. There are no long and sustained recessions or depressions, and qualified workers can quickly find work at the going market wage. The classical analysis does not imply that there is zero unemployment for frictions, and market power may produce microeconomic waste, distortions, and inefficiencies. The second element of the classical view is even more striking: macroeconomic aggregate demand policies cannot influence the level of unemployment and real output. Rather, monetary and fiscal policies can affect only the economy's price level, along with the composition of real GDP (Mohr & Rogers; 1998).

At the heart of the classical view is the belief that prices and wages are flexible and that wage-price flexibility provides a self-correcting mechanism that quickly restores full employment and always maintains potential output. The classic approach holds that prices and wages are flexible, so the economy moves to its long-run equilibrium very quickly, according to (Nordhaus & Samuelson; 1995).

Figure 2: The Classical View



In Figure 2, if AS or AD shifted, prices would react flexibly to ensure that full-employment output was sold. Here we see how flexible prices ensure that prices move down enough to increase spending to full-employment output.

Until the Great depression of the 1930s, many economists including David Ricardo (1772-1823) and John Stuart Mills (1806-1873), believed that the market system would ensure full employment of an economy's resources (Van Rensburg et al; 2011). According to the authors, the *classical economists* acknowledged that now and then abnormal circumstances such as wars, political upheavals, droughts, speculative crises, and gold rushes; would occur, deflecting the economy from full-employment status. When such deviations occurred, the economy would automatically adjust and soon return to full-employment output. For instance, a slump in output and employment would result in lower prices, wages and interest rates, which in turn would increase consumer spending, employment and investment spending (Van Rensburg et al; 2011). According to *classical economists*, any excess supply of goods and workers would soon be eliminated.

Classical macroeconomics concludes by saying that the economy always operates at full employment. This is an economy where prices and real wages are determined in competitive markets, moving flexibly up and down to eliminate any excess demand or supply, as in Figure 2. This approach is very much alive in the writings of today's new classical school. New classical economists base their views on modern economic developments, allowing for imperfect information, the existence of technological shocks, and frictions from shifts of resources among industries. Although dressed in modern clothing, their policy conclusions are linked to the classical economists of an earlier age (Nordhaus & Samuelson; 1995).

2.2.1.1 Wagner's Law

In 1883, Adolf Wagner, a German economist had already identified a growing share of government in the economies of industrialising European countries (Black et al; 2003). According to the authors, Adolf Wagner used some empirical evidence to formulate what is today known as "Wagner's law". In his own words: "The law of increasing expansion of public and particularly state activities becomes for the fiscal economy the law of increasing expansion of fiscal requirements. That law is the result of empirical observation in progressive countries, at least in our Western European civilisation. Its explanation, justification and cause is the pressure for social progress and the resulting changes in the relative spheres of private and public economy" (Peacock & Musgrave; 1968)

According to Wagner, rising government expenditure was an inevitable feature of the developing countries (Black et al; 2003). According to the authors, rephrased to present a modern version, the 'law' simply states that public expenditures will increase if the per capita income of industrialising countries increases. Adolph Wagner formulated a principle called the 'Law of the Increasing Extension of State Activity (Chang et al; 2004). Wagner's hypothesis deals with the growing relative importance of government activity in the national economy and has come to be recognized as 'Wagner's Law' (Chang et al; 2004). The authors note

that according to Wagner, there are three reasons to expect an expanding scope of public activity. First, the administrative and protective functions of the state have to expand due to the rising complexity of legal relationships and communications. Furthermore, increased urbanization and concentrations of population require higher public spending on law and order and socioeconomic regulation. Secondly, Wagner felt that the income elasticity of demand for public-provided goods such as education is greater than unity. Finally, the technological needs of an industrialized society require larger amounts of capital than are forthcoming from the private sector. Therefore, the state has to provide the necessary capital funds to finance large-scale capital expenditures. Although Wagner was not the first person to state this relationship, he was the first to attempt an empirical demonstration (Chang et al; 2004).

“Wagner’s Law” postulates that government spending is income elastic and that the ratio of government spending to income tends to grow with economic development. Moreover, the public goods and services provided by the government for non-military purposes, such as education, infrastructure, and laws, are regarded as important factors for economic growth (Wu et al; 2010).

The so-called ‘law of increasing state activity’ maintained that there is both an absolute and a relative expansion of the public sector (including central and local government’s bodies and public enterprises) at the cost of the growth in the private sector (Wagner, 1911) (Lamartina & Zaghini; 2010). This statistical association has been interpreted both in a loose and in a strict way. In a loose sense Wagner’s law points to a positive long-run co-movement between government expenditure and economic growth, while in a strict sense, it postulates a long-run elasticity of public spending with respect to GDP above unity (Lamartina & Zaghini; 2010). According to the authors, after the Second World War, the public sector assumed an increasing role in steering the economic growth in Western countries and the interest in Wagner’s statement gained new momentum. Since then, following the improvement in the econometric technique and benefiting from longer time series, many authors tested the law with increasing degree of sophistication (Lamartina & Zaghini; 2010).

At least two methodological approaches have characterized the relationship between government expenditure and economic growth (Wahab; 2004). According to (Wahab; 2004), in the first approach, government expenditure is endogenous to, or predetermined by economic growth and suggests that government expenditure responds positively to changes in growth so that as a country's income rises so does the size of the country's public sector. Hence, government expenditure is income-elastic with an elasticity coefficient that exceeds unity. (Wahab; 2004), acknowledges that the German economist Adolph Wagner (1890) first introduced this point of view. Wagner himself justified it, by the following considerations: as the economy grows, there will be a need for more administrative and protective functions of the state, a need for increased provision of social and cultural goods and services, and an increased need for provision of proper administrative and bureaucratic controls to ensure the smooth operation of market forces.

Wagner's contribution is relegated to the margins of mainstream public finance and corporate governance, undeservedly so because underlying concepts in his law are directly relevant to the process of reform in post-communist transitional economies. While it does not help that Wagner's thesis has not been fully translated into English, the central concepts advanced by him provide a wealth of ideas for further research on the role of the state in economic development (Tobin; 2004). There are specific difficulties with measuring Wagner's Law and testing it empirically due to a lack of clarity regarding the exact meaning of the law. According to (Tobin; 2004), It is unfortunate that Wagner's thesis was labelled a law because his "law" is in fact more an analytical tool allowing useful relationships to be identified between the rate of economic growth and changes in the size of the public sector. It also opens the way for these relationships to be quantified making possible comparisons across different countries. In this manner, its main interest is more illustrative than prescriptive (Tobin; 2004).

In a study of the changes in government expenditures in South Africa, covering the period 1948-1975, Dockel & Seeber (1978) partially confirmed the relevance of Wagner's law for South Africa (Black et al; 2003). According to the authors, they found high income elasticities for most categories of government spending, which implies that government expenditures 'increase more than proportionally

with economic growth'. The study also found that, 'the South African case did not unambiguously support Wagner's idea that the dominant forces influencing government expenditure are social welfare, administration, and law and order. According to (Black et al; 2003), the situation has changed a lot since 1975, and even though social welfare, and law and order became important, it was only for a short period of time in the 1980s. The authors also note that over the last three decades, real per capita income in South Africa decreased. According to the author, the growth of these categories of state expenditure cannot therefore be attributed to high income elasticities, but rather, it was more likely the result of the social unrest and political instability that characterised the economy at the time.

In conclusion, Wagner's Law is applicable to our analysis of government spend and economic growth in South Africa, and will be tested later in Chapter 5.

2.2.2 The Keynesian Theory

Aggregate expenditure theory emerged as a critique of classical economics and as a response to the Great Depression (Van Rensburg et al; 2011). According to the authors, the Great Depression of the 1930s called into question the theory that 'supply creates its own demand' (Say's Law). This was because in the USA, real GDP declined by 40 percent and the unemployment rate was nearly 25 percent. Other nations experienced similar impacts, and cyclical unemployment lingered for a decade (Van Rensburg et al; 2011). According to the authors, obvious inconsistencies exist between theories that say that unemployment is virtually impossible, and yet have the actual occurrence of a 10-year siege of substantial unemployment.

Then, in 1936, British economist John Maynard Keynes (1883-1946) explained why cyclical unemployment could occur in a market economy (Van Rensburg et al; 2011). In his *General Theory of Employment, Interest, and Money*, Keynes attacked the foundations of classical theory and developed the ideas underlying the aggregate expenditure model (Van Rensburg et al; 2011). According to the

authors, Keynes disputed Say's Law, pointing out that not all income need be spent in the same period that it is produced. - Keynes noted the particularly volatile nature of investment spending - For instance, a substantial decline in investment will lead to insufficient total spending. According to the authors, unsold goods will accumulate in producers' warehouses, and producers will respond by reducing their output and discharging workers. This leads to widespread cyclical unemployment and eventually, a recession or depression (Van Rensburg et al; 2011). In contrast to the more *laissez-faire* view of the classical economists, Keynes argued that government should play an active role in stabilizing the economy. According to Keynes, recessions or depressions are not likely to correct themselves, and thus advocated for state intervention (Van Rensburg et al; 2011). This part of the theory links with our study.

One of the most significant changes in the economic and political life of the twentieth century was the introduction of demand management in the industrialized democracies (Backhouse & Bateman; 2006). According to the authors, national governments from across the world took on responsibility for a kind of economic function that had never been seen as a regular part of their brief: they began to use fiscal and monetary policy to try to stabilize the business cycle by stabilizing the total demand for goods and services (Backhouse & Bateman; 2006). Before Keynes, no one had ever produced a satisfactory theory of the demand for all goods and services in the economy (Backhouse & Bateman; 2006). According to the authors, no one had provided a way to talk clearly about aggregate demand for an economy's output. The authors add that Keynes's theoretical breakthrough amounted to the invention of 'macroeconomics', which is the theory of how the economy as a whole works.

The 1930s marked the first stirrings of the science of macroeconomics, founded by John Maynard Keynes as he tried to understand the economic mechanism that produced the Great Depression¹⁶ (Nordhaus & Samuelson; 1995). Keynesianism is one of the most contentious schools of thought of our time. It originated around 1929 from the neoclassical school (Mohr & Rogers; 1998). According to the authors, the Keynesian system is based on a subjective

¹⁶ The great depression of 1929

psychological approach, but like several other economists before him, he had a macro-economic approach aimed at addressing the problem of unemployment (Mohr & Rogers; 1998).

While the classical economists were preaching that persistent unemployment was impossible, economists of the 1930s could hardly ignore vast army of unemployed workers – (begging for work and selling pencils on street corners) - how could economics explain such massive and persistent unemployment (Nordhaus & Samuelson; 1995). Keynes' General Theory¹⁷ offered an alternative macroeconomic theory, a new set of theoretical spectacles for looking at the impact of economic policies as well as external shocks. The Keynesian revolution combined two different elements. First, Keynes presented the concept of Aggregate demand. Secondly, and equally revolutionary feature was the Keynesian theory of aggregate supply.

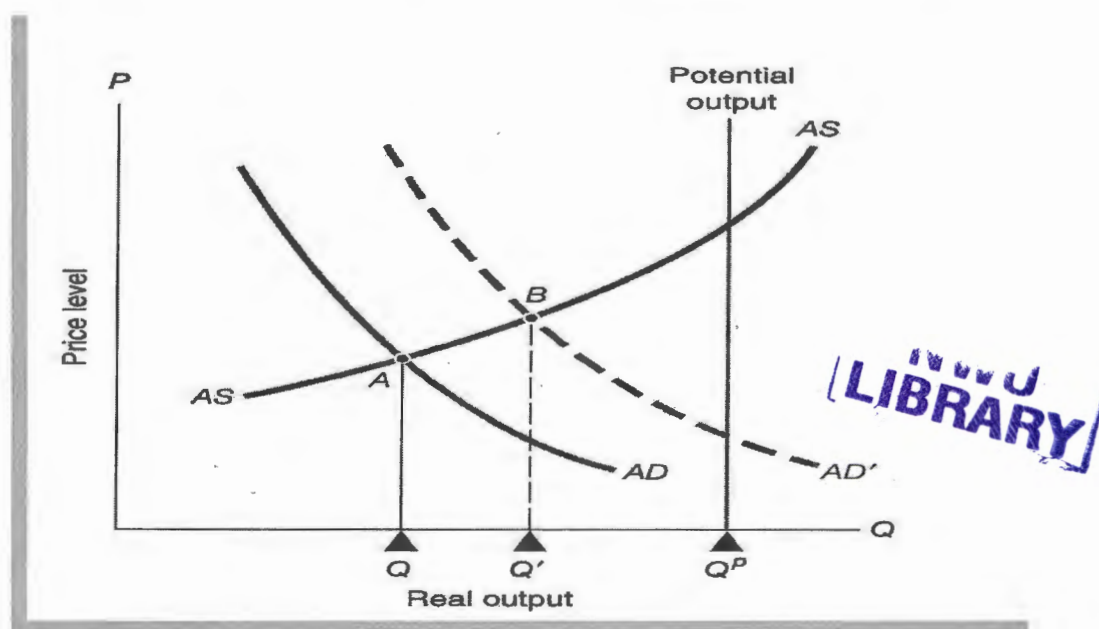
Whereas the classical approach assumed flexible prices and wages with the implication of a vertical classical AS curve, the Keynesian approach insisted on price and wage inflexibility and the flat or upward sloping AS curve. Supply definitely does not create its own demand, and output can therefore deviate from its potential for indefinitely long periods.

In the Keynesian model, aggregate supply slopes upward, implying that output will increase with higher aggregate demand, as long as there are unused resources. When AD is depressed, output will be in equilibrium at point A, with high unemployment. If aggregate demand increases from AD to AD', the level of real output increases from A to B, with prices increasing as well (See Figure 3).

Keynes underlined that there are economic and political reasons for preferring certain kinds of expenditures to others (Commendatore et al; 2009). Keynes and his followers had a macroeconomic approach to the determinants of the total or aggregate amounts of consumption, savings, income, output and employment (Mohr & Rogers; 1998).

¹⁷ Keynes wrote this book. "An inquiry into the Wealth of Nations"

Figure 3: Aggregate demand determines output in Keynesian approach



The importance of aggregate demand as the immediate determinant of national income, output, and employment is stressed. Keynesian thought maintains that effective demand consists of the sum of consumption, investment, government and net export expenditures. Every single penny spent on final goods and services creates an equal amount of income.

The crux of the Keynesian approach is that the explanation of changes in production and income is to be found in fluctuations in total expenditure in the economy (Fourie; 1999). Total expenditure in the economy is at the centre of the action. The significance of expenditure is that it induces production and determines production decisions (Fourie; 1999). Keynes began to campaign in October 1939 to make administrators see the budget not simply as a statement of public finance, but as an instrument to regulate the whole of domestic expenditure so as to avoid, or at least control, inflationary pressures (Booth; 1993) The Keynesian paradigm points to the existence of business cycles.

The existence of business cycles is *prima facie* evidence of the failure of market co-ordination and so provides a rationale for active government intervention intended to stabilise the economy. This view is the exact opposite of the classical view in that it is based on the belief that industrialised, market economies are

inherently cyclically unstable, and that natural economic forces in these economies generate the business cycle. An expansion generates factors that bring about its own end and induce a period of contraction. Similarly, the process of contraction generates the conditions for recovery. Keynesian theories of the business cycle thus concentrate on factors endogenous¹⁸ to the cycle that explain the phenomenon in terms of its internal dynamics (Mohr & Rogers; 1998). Keynes (1936) argued that government spending is an exogenous¹⁹ variable and can be used to generate economic growth. For this reason, government spending is a cause rather than effect of economic growth. Therefore, the causal relationship should run from government spending to economic growth (Tang; 2009).

According to John Maynard Keynes, aggregate demand determines total production and income in the economy (Black et al; 2003). During the heyday of Keynesianism in the 1950s and 1960s, fiscal policy was generally regarded as an important instrument of stabilization policy (Mohr & Rogers; 1998). According to the authors, if the economy was suffering from unemployment, an increase in government expenditure and/or a lowering of taxes was prescribed. When private sector spending was creating inflationary pressure, and/or balance of payments problems, the reverse had to apply. In addition, the income tax and unemployment benefits were regarded as *automatic stabilizers*, in the sense that changes in income would automatically trigger changes in tax revenue and transfer payments, thus stabilizing aggregate demand, income and output.

According to (Mohr & Rogers; 1998), in the 1950s and 1960s, there was widespread agreement on the need for such anti-cyclical fiscal policy, but the only real task was to make it work in practice. The authors conclude that, apart from practical considerations, the very notion of an anti-cyclical fiscal policy, aimed at shifting the *AD* curve or moving along a downward-sloping Phillips curve (or a vertical long run *AS* curve), were increasingly questioned during the seventies on theoretical grounds.

¹⁸ Endogenous factors are those factors that are induced by growth

¹⁹ Exogenous factors are. those factors that induce growth

Monetarists denied any anti-cyclical or anti-inflationary role for fiscal policy (Mohr & Rogers; 1998). In terms of their analysis, inflation can only be combated through monetary policy, while an expansionary fiscal policy will merely crowd out private expenditure in the long run. The only aspect of fiscal policy, which interests monetarists, is the financing of the budget deficit, and in particular, the degree to which government spending is financed by money creation.

Toward the end of the 1970s, disenchantment with the Keynesian approach became widespread (Nordhaus & Samuelson; 1995). According to the authors, the disenchantment came because of failures of Keynesian policies to stop the inflation of the 1970s, and it appeared that Keynesian fiscal policies were effective at stimulating the economy, but political resistance to raising taxes led to ineffectiveness against inflation.

In the face of cost-push, supply shocks and stagflation, Keynesians were forced to re-examine their earlier views on fiscal policy. In 1975 Walter Heller, a prominent American Keynesian admitted, "further work needs to be done" to measure the cost-push effects of anti-inflationary tax increases, and that "this was a serious gap" in their fiscal policy knowledge.

2.2.2.1 The Neo-Classical Theory

The neoclassical school started as a 'marginal school'²⁰, but eventually became part of neoclassical economics, or contemporary microeconomics. The ruling idea was that the value of an article is determined by its production cost, and its usefulness to the consumer, the final (marginal) unit of the article (Smit et al; 1996). The marginalists believed that the value and distribution theories of the classical economists were inaccurate, but their policy views were correct. They defended market allocation and distribution, deplored government intervention, denounced socialism and sought to discourage labour unionism as ineffective or destructive.

²⁰ The Marginal school of thoughts' main idea is that the value of an article is not determined by its production cost, but by its usefulness to the consumer, and therefore, by the use of a final marginal unit of the article.

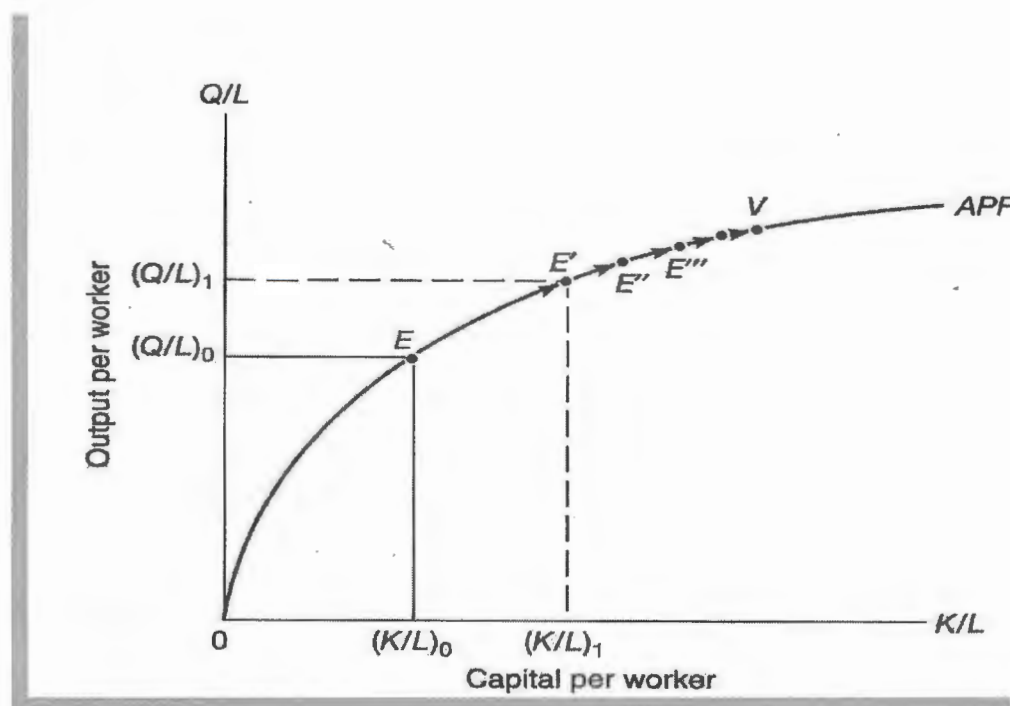
In order to understand how capital accumulation and technological change affect the economy, we first examine the neoclassical model of economic growth. Robert Solow, who received the 1987 Nobel Prize for this and other contributions to economic-growth theory, pioneered this approach. The neoclassical growth model serves as the basic tool for understanding the growth process in advanced countries, and the model is applied in empirical studies of the sources of economic growth (Nordhaus & Samuelson; 1995).

The basic assumption under the neoclassical growth models is that they describe an economy in which a single homogenous output is produced by two types of inputs, capital and labour. In contrast to the Malthusian analysis, labour is determined by forces outside the economy and is unaffected by economic variables. In addition, they assume that the economy is competitive and always operates at full employment, so they can analyze the growth potential output (Nordhaus & Samuelson; 1995). The major new ingredients in the neoclassical growth model are capital and technological change. In the model, capital consists of durable produced goods that are used to make other goods. Capital goods include structures like factories and houses, equipment like computers and machine tools, and inventories of finished goods, and goods in process. (see Figure 4)

Robert Solow won the Nobel Prize in economics for his contributions to growth theory (Van Den Berg; 2001). According to the authors, he will best be remembered for developing the simple growth model. The model has gained such widespread fame that it is referred to as the 'Solow Model'. The model was first presented in the mid 1950's as a response to the Harrod-Domar Model²¹ (Van Den Berg; 2001). Solow defined a production function that permits factors to be continuously substituted for each other. Figure 4 expresses such continuous substitution.

21 One growth model that was particularly popular with economic planners just after World War II came to be known as the Harrod-Domar model. The model was based on independently published articles by Roy Harrod and Evsey Domar (Van Den Berg; 2001). According to the authors, the models were simple extensions of Keynes's well-known macroeconomic model, which dominated economic thinking in the 1940s. The Harrod-Domar model assumes that there is an unlimited amount unemployed labour, and that productive investment is equal to saving (Van Den Berg; 2001)

Figure 4: Economic growth through capital growth



In Fig. 4, as the amount of capital per worker increases, output per worker also increases. This graph shows the importance of 'capital deepening'

2.2.3 The Endogenous Growth Theory

A major goal of government is to raise the growth of real income per capita, which serves as a working definition of economic growth (Abedian & Biggs; 1998). According to the authors, since the eighties there has been a renewed research focus on economic growth theory, and in particular these efforts have examined whether economic growth can be influenced by the design of appropriate government policy (Abedian & Biggs; 1998). According to the authors, this research is known as Endogenous growth theory, and is developed in response to the limitations of Neo-Classical growth theory, with its exogenously assumed rate of growth and given state of technology having diminishing returns.

Endogenous growth theory places particular emphasis on externalities (Abedian & Biggs; 1998). According to the authors, these externalities arise either as public goods, such as investments in human capital and research and development, or as private goods where firms are able to exploit economies of scale. In addition, another important element of Endogenous growth theory is that a country can choose per capita growth rates endogenously by the appropriate actions of private agents or the policies of central government (Abedian & Biggs; 1998). Endogenous growth theories suggest that government expenditure has an important impact on the long-run growth rate (Pieroni; 2007). According to (Pieroni; 2007), its influence depends on the size of government intervention and on the different components of public spending. Moreover, different kinds of government expenditures have heterogeneous effects on economic growth. For example, public infrastructures, research and development and public education are often considered public goods that have a positive effect on economic growth (Pieroni; 2007).

A more detailed account of the influence of government expenditure on growth can be found in the literature that follows the lines set by (Barro; 1990). This author assumes that government expenditure enters the production function and is complementary with private inputs. It has two opposite effects on the rate of growth, one positive, working through the increase in the productivity of private capital, and one negative, working through the reduction of saving due to the variation in tax revenues. The economic mechanisms captured by this analysis only refer to the effects on the rate of growth emerging in the production or supply side of the economy. Those produced by the variations in income distribution and effective demand are absent (Commendatore et al; 2009).

With inflation becoming an increasing problem and the apparent failure of Keynesian economics in the United States, monetarism rose to prominence with what appeared to be a plausible explanation of inflation and the causes of a shifting Phillips curve²² (Mohr & Rogers; 1998). According to the authors, the

²² Made famous by A.W Phillips (1958), in its original form the Phillips curve was an empirical finding which showed an inverse correlation between the rate of change of money wages and the unemployment rate in the United Kingdom. Mohr & Rogers (1995) We refer to the Phillips curve as the *inflation-unemployment* relation.

origins of monetarism in the post-war period can be traced to the work of Milton Friedman.

Monetarism holds that the money supply is the major determinant of short-run movements in nominal GDP and of long-run movements in prices (Nordhaus & Samuelson; 1995). The main difference between monetarists and others lies in their approaches to the determination of aggregate demand. While Keynesian theories hold that many different forces affect aggregate demand, monetarists argue that changes in the money supply are the primary factor that determines output and price movements (Nordhaus & Samuelson; 1995).

Friedman initiated a revival of the quantity theory tradition, by arguing for a reform of the monetary and banking system, and the adoption of 100 percent reserve banking (Mohr & Rogers; 1998). According to the authors, Friedman thought he would impose the properties of the quantity theory, together with the self-adjusting nature of the real economy in the long-run, and that this will ensure a stable monetary environment, which would contribute to growth and full employment (Mohr & Rogers; 1998).

Many governments around the world adopted Friedman's doctrine of 'monetarism' (Nordhaus & Samuelson; 1995). In October 1979, Paul Volcker was then Chairman of the Federal Reserve in the United States of America, and he launched a fierce counterattack against inflation in what we know as "the monetarist experiment". The Federal Reserve, in a dramatic change of its operating procedures, decided to stop focusing on interest rates and instead endeavoured to keep bank reserves and the money supply on predetermined growth paths (Nordhaus & Samuelson; 1995). According to the authors, the experiment was successful in slowing the economy and reducing inflation.

Monetarists assert that inflation is a monetary phenomenon, in the sense that sustained high rates of monetary growth cause high inflation, and that low rates of monetary growth will eventually produce low inflation (Mohr & Rogers; 1998). The fact that inflation is a monetary phenomenon does not imply that excessive monetary expansion is its sole or principal cause. The Monetarists assume that the monetary authorities exogenously determine the quantity of money. This assumption is one of the cornerstones of the monetarist theory, and which, they

empirically verify based on the observed correlation between changes in the price level and changes in the quantity of money (Mohr & Rogers; 1998).

In conclusion, the major contributions made by this school of thought is that, monetarists helped integrate monetary analysis into general economic theory, and in so doing, may have overemphasised the role of money in their analysis. Monetary theorists deal with aggregate analysis taking into account total demand, total money supply, total savings, and total investment, as well as the individual person's or firm's real sacrifices, income, consumption, savings and investment.

2.2.3.1 Supply-Side Economics

Supply-side economics was all the rage in the United States in 1981, the first year of the Reagan administration. It was the guiding principle behind the tax cuts of that year, and served as the justification for the optimistic scenario presented by the administration's first budget (Mohr & Rogers; 1998).

Supply side economics or Reaganomics consisted of a few loose ideas on how a market economy functioned (Mohr & Rogers; 1998). According to the authors, the view is anti-fiscalist, against the Keynesian tradition of a fiscal demand policy of government in the sense that, the negative encouragement effect or discouragement effect of tax on the willingness of people to work is emphasised (Mohr & Rogers; 1998).

This school emphasised incentives for people to work and to save, and it proposed large tax cuts to reverse slow economic growth and slumping productivity growth (Nordhaus & Samuelson; 1995). According to the authors, two central features of supply-side economics emerge, and they are, an emphasis on incentives and advocacy of large tax cuts.

A first theme of supply-side economics is the key role played by incentives, which denote adequate returns to working, saving, and entrepreneurship. Supply-side economics highlights the role of fiscal policy in the determination of

economic growth and aggregate supply (Nordhaus & Samuelson; 1995). According to supply side-economics, tax changes affect the economy through their effect on post-tax factor rewards rather than on dollar flows of incomes and spending; tax rates affect the relative prices of goods and thereby affect supplies of labour and capital. The lowering of tax rates on labour, interest, or dividends can increase saving, investment and economic growth. In the context of aggregate supply-and-demand analysis, lowering tax rates would raise the post-tax return to capital and labour. Higher post-tax returns would induce greater labour and capital supply, along with higher rates of innovation and productivity growth; and the increase of inputs and innovation would increase the growth of potential output and thereby shift aggregate supply to the right (Nordhaus & Samuelson; 1995).

The other theme of supply-side thinkers emerges in its advocacy of large tax cuts. They argue that government has too often used taxes to raise revenue or stimulate demand while ignoring the impacts of the rising tax burden on incentives. In their view, the high taxes lead people to reduce their labour and capital supply (Nordhaus & Samuelson; 1995).

2.2.4 Summary

Having looked at the theoretical background from a historical perspective, we have gained insight into the behaviour of the variables under study. It is evident from the literature that the world has come a long way.

From the theory, it is clear that classical economists believed that the market was self-correcting, and that usually it returns to full-employment levels because supply creates its own demand. However, the Great depression of 1929 left this theory wanting. To fill the gap, Keynesian economics came into the picture, and introduced a demand management tool, which advocated for active government involvement in the economy. The theory is specific to our treatment of the variables, and addresses age-old issues.

If it was not for early studies into the relationship between the variables, we would still be grappling to unpack the salient points, about the two variables. Having taken a closer look at all the theory, the next section will touch on the empirical evidence and research for the Fiscal Policy-Growth problem.

2.3 Review of Existing Literature

This section introduces the literature review on the government expenditure-growth nexus. The review of the existing empirical evidence is divided into sections, namely support for Wagner, support for Keynes, and support for Endogenous growth theory. This section will highlight the latest research into the impacts that government spending has economic growth.

2.3.1 Introduction



Policymakers are divided as to whether government expansion helps or hinders economic growth. Advocates of bigger government argue that government programs provide valuable “public goods” such as education and infrastructure. They also claim that increases in government spending can bolster economic growth by putting money into people’s pockets. Proponents of smaller government have the opposite view. They explain that government is too big and that higher spending undermines economic growth by transferring additional resources from the productive sector of the economy to government, which uses them less efficiently. They also warn that an expanding public sector complicates efforts to implement pro-growth policies—such as fundamental tax reform and personal retirement accounts—because critics can use the existence of budget deficits as a reason to oppose policies that would strengthen the economy (Mitchell; 2005). Which side is right?

During the last twenty years or so, studying the underlying causal process between government spending and GDP, or their close variants, has made parallel efforts. The principle reason that led researchers to this field of analysis

was the difficulty of a possible feedback in macro relations, which tend to obscure both the direction and the nature of causality. It is clear that knowledge of the true nature of the causative process between government spending and GDP will help determine the robustness of the estimated relationship. Should the causality be Wagnerian, the estimates derived from macro-econometric models would evidently suffer from simultaneity bias. On the other hand, if the causality were Keynesian, the estimates reported in public finance studies would similarly be biased (Loizides & Vamvoukas; 2004).

The existing empirical studies in general suggest that Wagner's law may hold for developed countries, but less likely so for developing countries (Wu et al; 2010). On the other hand, another strand of literature suggests that government spending could have a positive effect on economic growth if it involves public investment in infrastructure, but could have a negative effect if it involves only government consumption. Yet, previous studies have not reached a consensus on the relationship between government spending and economic growth, owing to their differences in the specification of econometric models, the measurement of government expenditures, and the selection of samples (Wu et al; 2010).

Wagner's law of increasing government activities has been subjected to various econometric tests in the past few decades. In particular, a number of studies utilize the Granger causality test to examine the causal relationship (Wu et al; 2010). The authors show that government expenditure and economic growth Granger cause each other; and therefore, the results support the hypotheses that Wagner's law holds and that the government plays a role in economic growth.

2.3.2 Support For Adolf Wagner's Law

(Wahab; 2004) provides new evidence on the relationship between government expenditure and economic growth using annual data for Organization for Economic Development and Cooperation (OECD) countries. According to (Wahab; 2004), unlike previous studies, his bivariate relation is parameterized in a way that allows the marginal behaviour of growth in government expenditure

across two alternative states of the economy to be examined: the first is when the economy is growing at or above its 'normal' (trend) growth rate; the second is when the economy's growth rate is below trend-growth.

The study uses a pooled time series/cross-sectional approach to investigate the relation between government expenditure and economic growth. A conditional model is specified, and estimated for all OECD countries with complete data. Annual government expenditure and GDP time series for the period between 1950 and 2000 for these OECD countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, UK and USA.

The results suggest that government expenditure increases less than proportionately with accelerating economic growth and decreases more than proportionately with decelerating economic growth. There is only a limited support for Wagner's Law.

Previous studies generally find mixed empirical evidence on the relationship between government spending and economic growth (Wu et al; 2010). According to the authors, the effects of economic growth on government expenditure have been examined by many empirical studies using various testing procedures and different measures of government spending. In their analysis they re-examine the causal relationship between government expenditure and economic growth by conducting the panel Granger causality test. (Wu et al; 2010), utilize a panel data set which includes 182 countries that cover the period from 1950 to 2004. The results from the whole sample show that government expenditure and economic growth Granger cause each other, and these results support the hypotheses that Wagner's law holds, whereby the government plays a role in economic growth.

(Wu et al; 2010), largely draw the same conclusions even if the countries are categorized by income levels and by the degrees of corruption. One exception that the results have is that for the low-income countries, government spending does not Granger cause economic growth. The possible explanation for the last result, according to the authors, is that the low-income countries generally have

poor institutions and corrupt governments, which cause the government expenditures to be irrelevant or destructive to economic growth.

(Chang et al; 2004), empirically examined five different versions of Wagner's law using annual time-series data on ten countries over the period 1951 to 1996. Included are three of the emerging industrialized countries of Asia: South Korea, Taiwan, and Thailand, as well as seven industrialized countries: Australia, Canada, Japan, New Zealand, USA, the United Kingdom, and South Africa.

The authors found several things exciting. First, unidirectional Granger causality running from income to government spending holds for the newly industrialized countries of South Korea and Taiwan, and the industrialized countries of Japan, the United Kingdom and the United States. This finding supports Wagner's proposition. The findings are consistent with several previous studies, and for the five remaining countries in this study: Australia, Canada, New Zealand, South Africa, and Thailand, no causal relationship was found between income and government spending.

(Loizides & Vamvoukas; 2004), examine if the relative size of government, measured as the share of total expenditure in GNP can be determined to Granger cause the rate of economic growth, or if the rate of economic growth can be determined to Granger cause the relative size of government. Utilizing annual data from the UK, Greece and Ireland, (Loizides & Vamvoukas; 2004), examined the relationship between government size growth and income growth in both bivariate and trivariate systems, based on cointegration analysis, ECM strategy and Granger causality tests. The following conclusions appear.

First, in all countries public expenditure Granger causes growth in national income either in the short or the long run. Their analysis generally rejects the hypothesis that public expansion has hampered economic growth in these countries. This is because the underlying growth rates impact of the public sector has been positive, which means that public spending promotes overall economic development. Secondly, in the analysis, Greece is supportive of the Wagner hypothesis that increased output causes growth in public expenditure. Third, the authors find that while causality from national income to public spending is the

distinctive feature of the Greek case, British data also indicated a similar pattern when a trivariate model with inflation as an additional variable is accepted.

(Kumar et al; 2011), present an empirical investigation into the validity of Wagner's Law for New Zealand over the period 1960 to 2007. To confirm the robustness of the results, the authors used General to Specific (GETS), Engle, and Granger (EG), Phillip Hansen's Fully Modified Ordinary Least Squares (FMOLS) and JML techniques. All the methods of estimation provided consistent results concerning the impact of income on shares of government spending in output with income elasticities ranging from 0.56 to 0.84. This implies that a 1% increase in per capita income leads to a 0.56–0.84% increase in the share of government expenditure of income. The results imply that per capita income increases by more than the increase in the share of the government spending in income. The results suggest that output measures Granger cause the share of government expenditure in the long run, thereby providing support for Wagner's Law, and these results are stable irrespective of the chosen output measure.

Empirical literature on fiscal cyclicity typically does not address whether there is a long-term relationship between government spending and output (Akitoby et al; 2006). Vast literature exists on Wagner's law, which states that government activity increases as economies grow, with the pace of increase being different for different branches of government (Akitoby et al; 2006). The authors examined the short and long-term relation between government spending and output in 51 developing countries for the period 1970–2002. Fiscal data obtained from the IMF Government Financial Statistics, while GDP, GDP deflators, and exchange rates are obtained from the IMF International Financial Statistics. The categories of public spending examined include: total spending, current spending, government consumption, wage and nonwage government consumption, government capital spending, noninterest total spending, and noninterest current spend. The results reveal evidence consistent with cyclical ratcheting and voracity reflected in a tendency for government spending to increase over time (Akitoby et al; 2006), also find that the main components of government spending are pro-cyclical in about 40% of all countries, the degree of which varies across spending categories. In addition, the authors show that output and government

spending are cointegrated for at least one of the spending aggregates in 70% of countries, implying a long-term relationship between government spending and output, which is in line with Wagner's law. This contrasts with the existing empirical literature, which generally provides weak support for Wagner's law for developing countries, while there is somewhat stronger support for industrial countries.

2.3.3 Support for John Maynard Keynes

(Alexiou; 2009), provides further evidence on the relationship between economic growth and government spending. The study explored the impact of a string of variables thought to condition economic growth using two different econometric approaches for seven countries in the South Eastern European region from 1995 to 2005. The evidence indicates that out of the five variables used in the estimation, government spending on capital formation, development assistance, private investment and a proxy for trade-openness all have positive and significant effect on economic growth, whereas the remaining one, population growth, is found to be statistically insignificant. He continues to note that it becomes apparent that the relationship between government spending and economic growth is far from clear. Two key points however can be made when reviewing the empirical studies. The empirical results are specification sensitive and the relationship between government spending and economic growth is usually negative when the former is expressed as percent of GDP and is generally positive when expressed as an annual percentage change.

(Govindaraju et al; 2010) use annual data from Malaysia for the period 1970 to 2006, and examine Wagner's law and the Keynesian hypothesis concerning the link between real government spending and real GDP. They use data on government spending, as well as education spending and the GDP. The data used, was obtained from the Asian Development Bank, and tested using the 'bound testing approach. The empirical analysis presented in their paper shows that within a multivariate framework, Wagner's law does not hold in the long-run in the case of Malaysia. Instead, their analysis supports the Keynesian view, which contradicts some existing results based on a bivariate analysis. According

to the authors, in overall terms, the Keynesian premise that government spending precedes GDP growth, in contrast to Wagner, is evident in Malaysia. The analysis suggests that in the case of Malaysia, government spending (including education) is an important determinant of GDP growth, and this suggests that in developing countries, at least in Malaysia, efforts to promote education can lead to GDP growth.

(Alm & Embaye; 2010), examine the impact of these and other factors on real per capita government spending in South Africa over the 1960-2007 period, starting with a standard median voter model of government spending and extending it to allow for various internal and external shocks. An important part of their estimation strategy is the use of Johansen's (1988, 1995) multivariate cointegration technique, which is useful in understanding the relationship between variables that have a unit root (Alm & Embaye; 2010). This cointegration result lends support to the notion that government spending per capita is associated not only with per capita income and the true cost of government service provision as given by the wage rate but also with the fiscal illusion caused by budget deficits, which make voters discount the true cost of provision of government services. This result also suggests that government spending per capita is not just adjusting to per capita income, but to a long-run equilibrium in which the tax share and the wage rate play a significant role in keeping the relationship stable.



The results on Granger causality show clear unidirectional Granger causality from per capita income to government spending per capita. The authors do not find Granger causality running from the tax share and the wage rate to government spending per capita, mainly because of the low power of such tests for cointegrated variables. The fact that these two variables are statistically significant in the cointegration relationship means that it is possible that there might be an indirect Granger causality of these two variables on government spending per capita through per capita income in the Republic South Africa. (Alm & Embaye; 2010), also find some evidence that government spending per capita was positively affected by external shocks (e.g. war, oil prices). These external shocks seem to play a significant role in explaining the dynamics of government

spending per capita growth in South Africa. Internal shocks seem less important factors.

2.3.4 Empirical Evidence for Endogenous Growth

(Hsieh & Lai; 1994), using an endogenous growth model, untangle the nature of the relationship between government expenditure and economic growth. They use a multivariate time series analysis, with the focus on the causal relationship. Their analysis is based on the historical data for the Group-of-Seven countries. The empirical results suggest that the relationship between government spending and growth can vary significantly across time, as well as across the major industrialized countries that presumably belong to the group. No consistent evidence is found that government spending can increase per capita output growth. In this study, public spending is found to contribute a small proportion to the growth of an economy.

(Ghosh & Gregoriou; 2008), investigate the impact of government expenditure on growth, in a heterogeneous panel, for a sample of developing countries. Using annual data on government expenditure for 15 developing countries from 1972–1999, available from the Global Development Network Growth Database. By means of a generalized method of moments' techniques, the authors show that countries with substantial government current expenditure have strong growth effects, which vary considerably across the nations. They also show that countries with substantial public capital spending have strong negative growth effects.

The current expenditure parameter shows a positive effect with respect to economic growth for all countries which suggest that, for nations such as Brazil, government current expenditures have a major role to play in determining long-run growth, whereas for countries like Sudan, current expenditure plays only a minor role in the growth of the nation. Their empirical results clearly show that current, rather than capital spending, contributes to growth. The authors pick expenditure on health and education out of capital spending, and expenditure on operations and maintenance (O&M) out of current spending. The results show

that both health and educational spending have a negative and significant effect on growth while the O&M spending component has a positive and significant impact on growth.

(Bose' et al; 2007), examine the growth effects of public expenditure by sector for a set of developing countries, paying attention to the 'sensitivity' issue arising from initial conditions and conditioning variables while also recognizing the possible existence of correlation between the expenditures in different sectors that may result in spurious coefficients in the growth equation due to omitted variables. Using data on public expenditures for both current and capital expenditures, at aggregated and disaggregated levels, for 30 developing countries using decade averages over the period 1970–90, and data drawn from the Central Government Consolidated accounts for these countries.

The results for the growth effects of public expenditures by individual sectors of the economy give rise to information that is particularly useful for developing countries, which are resource constrained and where the allocation of limited public resources between sectors is an issue of paramount importance. In this regard, their main contribution is the finding that education is the key sector to which public expenditure should be directed in order to promote economic growth. This result is novel and overturns previous findings of negative or insignificant positive effects of education expenditure on growth for developing countries.

(Nketiah-Amponsah; 2009), says that Economists have been particularly interested in the factors that cause countries to grow at different rates and achieve different levels of wealth. One of the possible explanations for the differences in wealth is how much governments spend and what they spend it on. According to (Nketiah-Amponsah; 2009), in pursuing growth objectives, governments in developing countries spend an average of 26 percent of the Gross Domestic Product (GDP) on goods and services.

Nketiah-Amponsah examined aggregated and disaggregated expenditure on economic growth in Ghana over the period 1970–2004. The study uses data drawn from Ghana Statistical Service, the International Monetary Fund's

International Financial Statistics, African Development Indicators, and some Government of Ghana Budget Statements.

The study reveals that the aggregated government expenditure retarded economic growth. The study's findings show that expenditures on health and infrastructure promote economic growth, while those on education had no significant impact in the short run.

(Delavallade; 2006), empirically examines the impact of corruption on the structure of government spending by sector. Using the three-stage least squares method and using annual data of 51 developing and 13 developed countries from 1996 to 2001. The author uses the most common definition of corruption, which is the biased use of a public service for private benefits. The study focuses on public corruption, and not on the private forms of corruption. According to (Delavallade; 2006), in all countries, and more noticeably in developing countries, corruption is detrimental to state efficiency, as it hampers budget equilibrium, diminishes expenditure efficiency and distorts its allocation between different budgetary functions. She adds that, for the same level of spending and for a given budgetary function, public spending is less efficient in countries with high levels of corruption. Corrupt public agents tend to favour investment projects which generate the highest bribes and which are not very efficient (Delavallade; 2006).

(Sahoo & Dash; 2009), determine that infrastructure development is one of the main factors contributing to overall economic development. According to the authors, firstly, direct investment in infrastructure creates production facilities and stimulates economic activities, and secondly, it reduces transaction costs, trade costs, and improves competitiveness. Lastly, it provides employment opportunities and physical and social infrastructure to the poor. In contrast, lack of infrastructure creates bottlenecks for sustainable growth and poverty reduction. Therefore, infrastructure development contributes to investment and growth through an increase in productivity, efficiency, and acts as a link between resources to factories, people to jobs and products to market.

Infrastructure demands strong planning, coordination, decentralization, private participation and commercialization of service providers rather than a top-down

approach. Since private participation in infrastructure is limited in developing countries (Sahoo & Dash; 2009).

In their study, (Sahoo & Dash; 2009), investigate the role of infrastructure in economic growth in India for the period 1970–2006. The results reveal that infrastructure stocks, labour force, and total investment play an important role in the economic growth of India. More importantly, the authors find that infrastructure development in India has a more significant positive contribution to economic growth than both private and public investments. Further, the causality analysis shows that there is a unidirectional causality from infrastructure development to output growth.

(Agénor & Neanidis; 2011), study the optimal allocation of government spending between health, education and infrastructure in an endogenous growth framework. Infrastructure affects not only the production of goods but also the supply of health and education services. The production of health (education) services depends also on the stock of human capital (health services).

(Aisa & Pueyo; 2005), present a model of endogenous longevity that result in a non-monotonic effect of government spending on economic growth. According to the authors, in general, the relationship between government spending and growth is considered to be negative, but, they find a non-monotonic relationship when considering public health spending specifically. The positive effect of public health expenditure on life expectancy, savings, and growth, could offset the effect of taking away resources from investment, if it is sufficiently intense. This could be the situation in developing countries and, in such a context, higher government health spending would lead to faster growth. However, the standard negative relationship probably still holds in developed countries.

(Pieroni; 2009), examines the impact of military spending on economic growth. The parametric results are in line with previous empirical findings concerning the relationship between the share of military expenditure and economic growth. In contrast, we find an insignificant impact on growth for the square of military expenditure when this variable is used as a proxy for alternative forms of non-linear relationship.

Literature on defense spending and economic growth dated back to the work by Benoit in 1973. Since then, there have been a plethora of studies written on the subject. Empirical results, nonetheless, have been rather disappointing (Chang et al; 2011) Applying GMM (Arellano & Bond; 1991) to panel data of 90 countries spanning over 1992–2006, the authors explore possible relationships between military expenditure and economic growth, using the definitions of income levels by the World Bank – high, middle and low. The preliminary analysis suggests a positive and significant at the 10 per cent level association between defense spending and growth. In the existing literature, this association has sometimes been reported as positive and significant. At the same time, other studies have found it to be negative, while in yet other studies the growth effect of defense expenditure has been found to be neutral (Bose et al; 2007).

(Glomm & Kaganovich; 2008), study how the relationship between economic growth and inequality depends upon the levels of funding of two of the largest government programs, public education, and social security. They do this in the context of an overlapping generation's economy with heterogeneous agents where the government collects a tax on labour income to finance these programs. The authors firstly take all public policy measures as exogenous and study implications of changes in public policy on growth and income inequality. And secondly, studied two redistributive government programs, pay-as-you-go (PAYG) social security and public education. The individual and combined effects on growth and inequality are used in a general equilibrium framework.

(Baldacci et al; 2008), provide an integrated assessment of the role of social spending and other policy interventions on human capital, economic growth, and social indicators. By building upon earlier studies, (Baldacci et al; 2008), analyze the dynamic direct and indirect effects of social spending on human capital and growth, while taking into account the interaction between education and health interventions. The empirical estimates are based on a panel dataset covering 118 developing countries from 1975 to 2000. Additionally, paper also examines the impact of different policy interventions for fostering human capital and growth.

The study finds that a number of policy interventions could be effective in moving countries toward the Millennium Development Goals (MDGs). Both education and health spending have a positive and significant direct impact on the accumulation of education and health capital, and a positive and significant indirect impact on growth. An increase in education spending of 1 percentage point of GDP is associated with 3 more years of schooling on average and raises the annual growth of GDP per capita by 1.4 percentage points in 15 years. Similarly, an increase in health spending of 1 percentage point of GDP is associated with an increase of 0.6 percentage point in the under-5 child survival rate and a rise of 0.5 percentage point in annual per capita GDP growth (Baldacci et al; 2008).

(Chang et al; 2008), examine the effectiveness of government spending on economic growth. The authors find that the desire for relative wealth-induced social status and/or the education component of relative wealth-induced social status are important ingredients in determining the growth rate effects of government spending. The authors use the Uzawa–Lucas framework to analyze their model. The results show that the desire for relative wealth-induced social status and/or the education component of relative wealth-induced social status are the key factors for determining the growth rate effects of government spending. The authors add that, provided individuals are concerned with their relative wealth-induced social status, education-induced social status plays a more important role than physical-asset-induced social status in determining the long-run neutrality of public spending with respect to the economy's balanced growth rate.

(Baldacci et al; 2008), use panel data from 118 developing countries during the period, 1971–2000. The authors explore channels linking social spending, human capital, and growth and compare the effects of alternative economic policy interventions. The results of their study show that there are substantial differences in the effects of social spending on social indicators and growth among different country groups. The positive effects are the highest in low-income countries and sub-Saharan Africa. This supports the view that social spending can be more effective in such countries in achieving Millennium

Development Goals, as the marginal returns to social spending tend to decline for countries with high levels of social outlays.

(Tang; 2009), empirically investigates the linkages between disaggregate government spending and economic growth in Malaysia with the bounds testing for co-integration approach and the modified Wald (MWALD) causality technique for their tests. Yearly data from 1960 to 2007 is used in their study. The co-integration test results suggest that government spending on education and defense are cointegrated with national income in Malaysia. The policy implication is that the Ministry of Education in Malaysia has to promote government spending on education and health although the causality results imply that education spending does not lead to growth because education spending is a long run human capital investment and these two public sectors (i.e. education and health) are the backbone for future economic development in Malaysia (Tang; 2009).

2.3.5 Summary

Virtually everyone is in favour of economic growth. However, there are strong disagreements about the best way to accomplish this goal. Some economists and policymakers stress the need to increase capital investment. Others advocate measures to stimulate research, development, and technological change. Still a third group emphasize the role of a better-educated workforce. This leaves us with many stones unturned.

In a South African context, government expenditure is vital, seeing as it is the government that can develop communities, through increased infrastructure projects, and other initiatives, aimed at creating jobs and growing the economy. The question is whether this is a result of market failure to deliver on some goods and services. This though, leaves more questions than answers, as to how we are going to help build a decent life for all the people of South Africa.

2.4 Review Research On the Government Spending and Growth nexus/ Related Studies on Government Spending

This part is divided into the experience of certain categories of countries namely, developing countries, developed countries, Africa, and the summary

2.4.1 Developing Countries

The examination of the relationship between government spending and economic growth is hardly a new area of exploration in the economics and public finance literature (Tang; 2009). At least two methodological approaches have characterized the relationship between government expenditure and economic growth. In the first approach, government expenditure is considered endogenous to, or predetermined by, economic growth. At this juncture, two competing hypotheses are advanced and studied in the literature. The first suggests that government expenditure responds positively to changes in growth so that as a country's income rises, so does the size of the country's public sector. Hence, government expenditure is income-elastic with an elasticity coefficient that exceeds unity. This point of view was first introduced by the German economist, Adolph Wagner (1890), who set forth 'the law of expanding state expenditures' and justified it by the following (Wahab; 2004).

(Tobin; 2005) applies Wagner's Law of increasing state activity to illustrate the changing function of the state in China because of economic liberalization. The application of Wagner's Law to China introduces new clarity on the central role of the state in China's economic development (Tobin; 2005). His paper indicates that the state has a central and necessary part to play in China's economic modernization. In addition, as modernization progresses, it is evident that the state will have to allocate more and more resources toward creating the necessary institutions to support a market economy as well as stepping in to provide for the needs of its citizens. Since the role of the state is shown to be an

essential part of economic development in China. According to the author, Wagner finds support in China

The normative literature on public capital recommends rational capital management practices including long-range capital planning, multi-year fiscal planning, project management, and infrastructure assessment programs to enhance efficiency and effectiveness in public investment, according to, (Srithongrung; 2008).

2.4.2 Developed Countries

Capital budgeting is a process or system of administrative procedures that relates a long-term Capital Improvement Program (CIP) to the methods that will be used to pay for those improvements and provide for the implementation of these long-term financial and physical plans. The literature on capital budgeting, including academic textbooks and documentation published by governmental financial groups, recommends a systematic capital process comprising four components: long-term capital planning, program budgeting, performance measurement, and infrastructure inspection programs. These components are keys to capital program performance and outcomes because they bring together the determination of fundamental decisions and detailed action plans that a government will follow in managing its infrastructure (Srithongrung; 2008).

Public infrastructure is found to have positive impacts on state economic productivity and short-term economic growth. The leading studies empirically prove that core infrastructure spending, including outlay on transportation and water systems, has positive effects on national and state economies, namely gross national product (GNP) and gross state product (GSP), respectively (Srithongrung; 2008).

It is important to distinguish between infrastructure and production structure. The infrastructure comprises those assets which are required for production. But do not contribute directly to production. These include roads, schools, and hospitals. Productions structure, on the other hand, refers to assets that contribute directly

to production, for example, tractors, trucks, and so on. This supplement to the production factor is made by investments (Nordhaus & Samuelson; 1995).

Three levels of infrastructure are identified: local, national and transnational. Infrastructure at all three levels are subject to certain market failures which require some form of government intervention. Given that the government is required to provide infrastructure, why is infrastructure important? Put differently, why the sudden emphasis in South Africa on infrastructure investment to reach the 6% economic growth target? Theory postulates a number of benefits from infrastructure, both for economic growth and equity. Furthermore, both the quantity (access to infrastructure) and quality (reliability of infrastructure or accompanying services) are important (Fourie; 2006).

Infrastructure has become an important policy focus. Not only are South African policy makers aware of the need for higher infrastructure investment (President Thabo Mbeki promised R372 billion in his 2006 State of the Nation address for the next three years), but the South African public are demanding it (as the emphasis on service delivery in the recent local government elections attests to).

2.4.3 Africa



For Ghana, the empirical model cannot reject Granger causality from national income to expenditure, which would seem to support a Wagnerian hypothesis. However, for Kenya there is no support for either the Keynesian or the Wagnerian hypotheses. On the other hand, the South African results seem to support a Keynesian hypothesis as causality is observed from expenditure to national income (Ansari et al; 1997). Over this period, government expenditure has deviated substantially and persistently from national income. Second, in the short run, of the three African countries only Ghana showed evidence of government expenditure being caused by national income. In other words, this supports Wagner's hypothesis as to the role of government expenditure as an endogenous factor of economic development. This result is based on the general

decline in the economy, and government expenditure and we have no evidence that this process is maintained for a growing economy.

Understanding how best to allocate scarce public resources between various 'productive' or 'growth-enhancing' components of expenditure is not just an issue of pure theoretical interest. In their attempt to achieve the Millennium Development Goals set forth by the United Nations in 1999, many low-income countries are now actively engaged in the design of strategies aimed at spurring growth and improving living standards. From that perspective, some recent reports have advocated a 'big push' in public investment in education, health, and infrastructure. A joint report by the Bretton Woods institutions, for instance, called for a doubling of spending on infrastructure in Sub-Saharan Africa, from 4.7 per cent of GDP in recent years to more than 9 per cent over the next decade (Agénor & Neanidis; 2011)

The recent revival of interest in growth theory has also revived interest among researchers in verifying and understanding the linkages between fiscal policies and economic growth (Bose et al; 2007). Not only do they find investment in education to be highly significant, but the magnitude of the effect of this variable on growth is considerable: a 1 percentage point increase in central government investment in education in relation to GDP is associated with an increase in the average annual growth rate of real GDP per capita by 1.5 percentage points. Their result on total education expenditure differs from conclusions drawn by previous studies, irrespective of whether these are based on data for a large pool of countries or developing countries. These earlier results indicated that the association of this variable with growth is either insignificant or non-robust. Their analysis strongly suggests that government expenditure on education has long-lasting effects on economic prosperity.

Accordingly, from the policy perspective, their analysis prioritizes the allocation of scarce government resources towards the education sector for at least some developing countries. Further, our analysis also suggests that aggregate current expenditure has no effect on growth, whereas aggregate capital expenditure has

a positive effect. This implies that, for developing countries, decisions on current versus capital expenditure should (at least in the aggregate) favour the latter in order to enhance growth.

2.4.4 Closing Remarks

It is evident that the some of the initiatives and programs by many governments promote economic growth. Yet there are still signs that show, that in developing countries, spending on health, infrastructure, education, and other social services are important, and that in these countries, a lot more still needs to be done to address development. From the review research, it is quite clear that there is not enough research carried out on African countries, and in particular South Africa. It is for this reason that this study attempts to add to the body of literature on the government spending and economic growth quandary. The next section introduces the South African experience, and gives a detailed account of economic growth and public expenditure in this country.

Chapter 3

3. South African Economy

3.1 Introduction

This section gives us a detailed account of the South African economy. This study acknowledges that the South African economy was mostly based on agriculture from around 1652 to 1860. For the purpose of this study, the period before 1652, will be omitted, but an attempt will be made to analyse all the information from around 1860.

Until the 1860's, the Southern African economy was dominated by agriculture (Mohr & Fourie; 2004). According to the authors, the turning point was the discovery of alluvial diamonds in 1867, and in particular, the discovery of the diamond "pipes" of Kimberley in 1870 and 1871. The discovery of diamonds led to a boom in mining activity. The authors add that the greatest single event in the history of the South African economy was the discovery of gold on the Witwatersrand in 1886, which had the same kind of effects as the discovery of diamonds, but on a larger scale (Mohr & Fourie; 2004). After the discovery of diamonds and gold, South Africa was transformed from an agricultural to a mining economy (Smit et al; 1996). According to the authors, the effects of the industrial revolution were felt as far as Southern Africa, and trained workers, technicians, and entrepreneurs streamed into the country from Europe. For the first time foreign capital came to South Africa on a large scale (Smit et al; 1996). According to the authors, based on the gold-mining industry, trade relations with other countries were initiated, and the South African economy developed into an industrial giant, and large metropolitan areas developed around Johannesburg, the Witwatersrand, and the Free State Goldfields.

Industrial development started from around 1910, when South Africa unified into the Union of South Africa (Smit et al; 1996). According to the authors, the transition from agriculture to mining, to industry, represents the main structural change in the production system of the country. Unionisation in 1910 brought with it uniform economic policy, and mining in particular led to the development of

significant secondary (factors) and tertiary (services) sectors (Smit et al; 1996). The early phases of economic development in any country are usually dominated by the primary sector²³ (agriculture and mining), followed by a phase in which the secondary sector²⁴ (manufacturing, gas, water, electricity, etc) becomes the most important (Mohr & Fourie; 2004). The next stage of the process is characterized by strong growth in the tertiary sector²⁵, particularly in financial and government services (Mohr & Fourie; 2004). South Africa was an exporter of agricultural goods before it exported anything else and by 1910, it was exporting nearly £ 10 million of agricultural goods (Fedderke & Simkins; 2009)

Between 1948 and the late 1970s, the NP (National Party) advocated a state-interventionist economic vision, but one limited to the white population (Habib & Padayachee; 2000). According to the authors, just like any other developing country at the time, South Africa pursued an import-substitution economic strategy that facilitated the expansion and development of the country's manufacturing sector, and especially the production (using relatively cheap black labour) of durable consumer goods. South Africa declared itself a republic and left the Commonwealth in 1961, thereby breaking the last symbolic links with the British Empire (Habib & Padayachee; 2000). The country was subject to increasing political isolation as a result of the pursuit of policies of racial segregation and state partition pursued by the National Party government. In view of the numerical superiority of the African population within South Africa, the Union government had effectively excluded them from participation in the political process. However, decolonization elsewhere on the continent led to increased pressure for African political rights within South Africa (Christopher 2009)

The NP's economic vision, however, underwent a dramatic transformation in the late 1970s. Afrikaner firms, benefiting from three decades of government contracts and contacts, developed into large conglomerates with a significant stake in all sectors of the country's economy (Habib & Padayachee; 2000).

²³ The 'primary sector in South Africa is represented by agriculture and mining

²⁴ The secondary sector in South Africa is represented by manufacturing, gas, water, electricity etc.

²⁵ The tertiary sector in South Africa is represented by financial services, government, and services industries

Confronted by the political crisis of the late 1970s, Afrikaner businessmen like their English counterparts, felt confident enough to advocate both political liberalization and socioeconomic reform (Habib & Padayachee; 2000). According to the authors, they also pushed for the gradual liberalization of the South African financial system and (eyeing future markets abroad) for the country's further integration into the world economy. These views diverged significantly from those advocated by other classes within the Afrikaner establishment (Habib & Padayachee; 2000). According to the authors, this, in part, provoked the ideological struggle between *verligtes* (the enlightened) and *verkrampes* (the conservatives) within the NP in the late 1970s. The *verligtes* won and the NP began to advocate and implement a more market-oriented economic program, especially in respect of monetary, exchange rate and labour market policy. This early neoliberal experiment, which was pioneered in the first half of P.W. Botha's rule, was weakened by political resistance, township boycotts, and militant strikes. The adoption of the 'tricameral' constitution in 1983 and its rejection by African National Congress aligned political groupings led to the formation of the United Democratic Front in 1984 (Fedderke & Simkins; 2009).

In August of 1985, President Botha gave a speech intended to introduce further reforms to apartheid. The reforms, however, were substantially less than what the international community had been expecting. The crisis intensified, the South African Rand fell further and in late August the government temporarily closed the stock exchange and foreign-exchange markets and suspended interest payments on its debt (Levy; 1999). The RAU (Rand Afrikaans University's Institute for American Studies) calculated that 215 American companies withdrew from South Africa between 1984 and 1990 (Smit et al; 1998).

South Africa's democratic transition in 1994 created expectations of a dramatic turnaround in economic performance. Trade and financial sanctions and internal political opposition to the apartheid government had contributed to the poorest ten-year growth performance (1984 – 1993) since the Second World War and the removal of these constraints was widely expected to transform the country's economic performance (Du Plessis & Smit; 2006).

(Smit et al; 1996), say that in certain respects (i.e. gross national product, industrial development, infrastructure, and technological development), South Africa is considered a developed country. However, with respect to population growth, productivity, distribution of income and unemployment, South Africa is developing country (Smit et al; 1996). This situation is 'dualism' and it refers to South Africa's mixture of First-World and Third-World conditions. A popular view is that South Africa has a controlled capitalist economy, because it has many characteristics of a pure capitalist economy, as well as high levels of state intervention. A second view is that South Africa is moving in the direction of democratic socialism. The main reason being that since the end of the eighties, the budget of the government has tended more towards social goals such as health, education, and housing, while trying not to sacrifice the market economy (Smit et al; 1996).

3.2 Evolution of GDP and GDP Growth in South Africa

When the Union of South Africa formed in 1910, the South African economy was still largely based on the exploitation of natural resources (Mohr & Fourie; 2004). According to the authors, mining and agriculture accounted for almost half of GDP, while the contribution of manufacturing was about 4% (see Fig 1). In 1912, South Africa could be characterized as an open economy. Total exports of South African produce amounted to £ 23.2 million, excluding ships' stores and gold. Gold exports were £ 38.3 million. National income in that year was £ 132.9 million. This level of national income had been reached by substantial capital imports, both directly in the gold mining industry and indirectly through loans to colonial governments as their revenues expanded (Fedderke & Simkins; 2009). According to the authors, one problem facing the Union was the inheritance of a high level of public debt standing at £116.0 million in 1910, and representing 96% of national income in 1912. The authors add that of the inherited debt, £ 74.1 million had been incurred on railways and harbours and a further £ 17.1 million had its origins in war, defence and post-1902 reconstruction in the Transvaal and Orange Free State (Fedderke & Simkins; 2009).

World War I provided a great stimulus to South African manufacturing, and by the 1920s, manufacturing was promoted by a deliberate policy of industrialisation through import replacement. The South African Reserve Bank was established in 1920, and had the sole right to issue notes and the duty to control the monetary system (Smit et al; 1996). The authors add that in 1928 a domestic iron and steel industry was started with the establishment of Iscor. Furthermore, in 1932, South Africa withdrew from the Gold Standard, and the value of the country's gold exports was increased. According to the authors, this helped draw the country out of the depression it had been with the rest of the world since 1929.

Table 1: Contributions of different kinds of economic activity to South African GDP

	Percentage contribution to GDP						
	1911	1920	1930	1940	1960	1990	2002
A. Kind of economic activity							
Agriculture	21.5	22.7	14.3	12.6	12.4	5.2	3.8
Mining	27.3	17.5	15.2	19.4	12.7	10.6	8.1
Manufacturing	4.2	7.4	9.7	12.8	21.0	25.4	18.8
Trade	12.8	15.6	14.9	13.9	14.2	13.4	13.3
Financial Services	2.8	2.6	2.6	2.8	10.8	14.5	19.5
General government	5.5	7.1	8.4	10.5	8.6	14.0	15.8
Other	25.9	27.1	34.9	28.0	20.3	16.9	20.7
B. Sector							
Primary sector	48.8	40.2	29.5	32.0	25.1	15.8	11.8
Secondary sector	5.9	10.0	13.6	17.1	26.6	33.0	24.0
Tertiary sector	45.3	49.8	56.9	50.9	48.3	51.2	64.2

Sources: Statistics South Africa, SA Statistics 2002, South Africa Reserve Bank, Quarterly Bulletin, March 2003

Industrialisation progressed rapidly, and by 1940, the gross value of industrial output in South Africa was five times as much as at Unionisation in 1910. During the Second World War, there were many restrictions on production and consumption, but soon after the War, industrial production expanded to supply built-up demand. According to (Smit et al; 1998), the period after World War II was South Africa's industrial revolution. The authors point to the discovery of rich goldfields in the Orange Free State, in the early 1950s, as well as the discovery

of Uranium on the western and eastern extremes of Witwatersrand (now known as Gauteng) which further contributed to exports and domestic prosperity.

In the early 1950s, the industrial revolution was evident with the rail and road network expanding rapidly (Smit et al; 1996). According to the authors, South Africa was becoming the industrial giant of Africa. In addition, this revolution created a large demand for labour, which led to the complete urbanisation of whites, and eventually this economic development led to blacks becoming integrated into the developed economic system of South Africa. The period shortly after the introduction of political apartheid saw retrogression in the government's distributive stance, with the benefits of spending becoming more concentrated on whites (Black et al; 2003). According to the authors, gaps in social spending between the different racial groups remained large or even widened, despite favourable economic conditions. Defence spending remained relatively low, despite some expansion in the early 1960s after the Sharpeville incident and South Africa becoming a republic (Black et al; 2003).

The Sharpeville massacre in March 1960 resulted in a government ban of all opposition groups (Cameron; 2003). According to the author, many of these groups began armed underground struggles for Black and "Mixed Race" liberation. The South African government's determination to follow their own "God given" path of White supremacy and "separate development" in the face of internal opposition and denunciation from Asian and African Commonwealth member states led them to leave the Commonwealth and declare themselves a republic in May 1961 (Cameron; 2003). Sustained economic growth provided ample scope for social spending on whites to rise strongly with only limited upward drift of the public spending ratio, especially during the 1960s (Black et al; 2003).

Unlike the more tranquil decades of the 1950s and 1960s, the 1970s saw the world economy subjected to a number of shocks (Mohr & Rogers; 1998). According to the authors, these shocks included the collapse of Bretton Woods in 1971, the oil shocks of 1973-1974 and 1979, which rendered policy-making difficult. In 1973, sales to South Africa were banned, and OPEC nations applied

an oil embargo starting the same year (Levy; 1999). When South Africa entered the Angolan conflict, the Soweto riots erupted, and a major downswing started in South Africa (Mohr & Rogers; 1998). The 1976 Soweto uprising began as a revolt against a government plan to teach Afrikaans in black schools resulted in international attention, and prompted the United Nations (UN) arms embargo, as well as private codes of conduct for foreign firm operating in South Africa.

In 1977, the United Nations (UN) banned arms sales to South Africa (Smit et al; 1996). According to the author, the Commonwealth, through the Gleneagles Agreement, broke all sporting ties with South Africa. Since 1975, fiscal policy has been characterised by a combination of high military and security outlays and rising social spending to reduce the social gaps (Black et al; 2003). According to the authors, this period can be described as one of reform and repression, this because of attempts at social reform (including the three-chamber parliament and a rapid expansion of black education) were too limited to ensure social peace.

Responding to reform pressures, in 1984 the South African government adopted a new constitution that gave Indians and “colored’s” some right to participate but continued to exclude blacks (Levy; 1999). Unrest in South Africa persisted and intensified and the government responded with repression. In July of 1985, President P.W. Botha declared a state of emergency (Levy; 1999). From 1984 to 1987, sanctions become increasingly severe, include and potential including trade boycotts and financial sanctions (Smit et al; 1998). According to the authors, in 1985 overseas companies started withdrawing from South Africa. In August 1985, following political unrest and potential actions by activists, foreign banks decided not to renew credit buying in South Africa (Smit et al; 1998). According to the authors, South Africa was forced to put a moratorium on repayments of foreign debts.

The mounting frustration with the persistence of apartheid, coupled with South Africa's apparent economic vulnerability, prompted a round of multilateral economic sanctions. In September 1985, the European Community (EC) imposed a set of very limited trade and financial sanctions on South Africa, and

the Commonwealth countries adopted similar measures in October 1985. In the United States, the Reagan administration was opposed to South African sanctions but imposed a limited export ban to head off stronger action in Congress (Levy; 1999). According to the author, in December 1985, South Africa extended its freeze on debt repayments until March 1986. In February 1986, an interim agreement with creditors was reached and in March Botha lifted the state of emergency. The state of emergency was re-imposed in June, however, as the tenth anniversary of the Soweto uprising approached. In the fall of 1986, the second and more significant round of sanctions ensued. In September, the EC banned imports of iron, steel, gold coins from, and new investments in South Africa (Levy; 1999).

Although these sanctions were in place, the repression of the black majority continued and at times intensified. In early 1988, for example, the government banned all major nonwhite opposition groups and prohibited political activity by trade unions. During the late 1980s, however, secret negotiations were underway between representatives of the government and leaders of the African National Congress (ANC). And Finally in 1990, Nelson Mandela was released from prison, and soon became South Africa's first Black President.

3.2.1 Economic Growth in South Africa

The features of the international economic regime which assisted South African growth between 1870 and 1914, were the free flows of direct and portfolio capital and the free trade regime (Fedderke & Simkins; 2009). South Africa did well to attract the volume of mining finance that it did and pushed infrastructural development to the limit, creating a somewhat precarious fiscal inheritance at Union in 1910 (Fedderke & Simkins; 2009). The authors found that there was mild economic prosperity between 1910 and the middle of 1913, followed by uncertainty and recession until early 1915 and then an upswing until mid-1920. According to the authors, South Africa, like Britain, remained on the gold standard until 1918, and after that, the sterling price of gold rose from £4.25 per ounce in 1918 to £5.59 in 1920, but then dropped to £4.61 in 1922. The authors

add that Union expenditure exceeded union revenue by substantial amounts between 1912 and 1923. However, revenue was boosted by the introduction of personal income tax from 1915 and expenditure was reined in after 1923 and the deficits were turned into surpluses in all years from 1924 to 1945 except 1931.

The United Nations estimated that about \$2 000 million annually of long-term and short-term capital moved on balance in the mid-1920s from capital exporters (principally the United States, the United Kingdom and France) to developed, semi-developed or underdeveloped debtor countries (Fedderke & Simkins; 2009). According to the authors, after 1928 the flows slowed. First France reversed its capital outflow, and then the United States capital issues for foreign account declined. Such capital flows as occurred increasingly took place within blocs of countries rather than through an open world market (Fedderke & Simkins; 2009).

Between 1912 and 1939, value added in private manufacturing rose from £ 8.9 million to £ 53.8 million (Fedderke & Simkins; 2009). According to the authors, the increase in output was accompanied by considerable diversification (i.e. motor vehicle assembly (1922), textiles and cotton spinning, diamond cutting and the manufacture of rubber tyres and the metal trade). The Iron and Steel Corporation (ISCOR) commenced production in 1933. There was also direct state intervention through legislation in 1928 to establish ISCOR and through the establishment of the Industrial Development Corporation, which was designed to help capitalise South African businesses, many of whom found it hard to raise capital on their own.

South Africa left the gold standard at the end of 1932 and the effect on the economy was immediate (Fedderke & Simkins; 2009). According to the authors, the sterling price of gold moved up from £ 4.31 in 1932 to £ 7.10 in 1935. The Gold price was stabilised at £ 8.40 between 1940 and 1945.

Table 2: Economic Growth in selected countries 1960-1992

Country	<u>Economic Growth in Selected Countries, 1960-1992</u>			
	<u>Average annual increase in real GDP</u>			
	1960-1969	1970-1979	1980-1989	1990-1992
France	5.6	3.7	2.3	1.5
United Kingdom	2.9	2.4	2.3	-0.8
United States	4.3	2.8	2.6	0.6
Australia	5.3	3.8	3.3	0.8
Canada	5.4	4.7	3.1	-0.4
New Zealand	4.1	2.3	2	-0.1
Japan	10.9	5.2	4.2	3.4
South Korea	7.6	9.5	8.1	7.5
Malaysia	4.2	8	5.7	8.9
Argentina	4.2	2.6	-0.8	5.8
Brazil	7.7	7.8	2.9	-1.3
Chile	4.7	1.9	3.4	6.1
South Africa	5.8	3.3	2.2	-1
Kenya	3.4	6.4	4.2	2
Zambia	5.5	1.2	1.4	-1.1
Zimbabwe	n.a	2.4	4.9	2.1

Source: International Monetary Fund, International Financial Statistics
(Mohr & Rogers; 1998)

Gold output fluctuated between 1932 and 1937 and rose from 11.7 to 14.4 million ounces between 1937 and 1943, falling back to 12.2 million ounces in 1945 (Fedderke & Simkins; 2009).



During the 1960s, South Africa, in common with many industrial and developing countries, experienced high rates of economic growth (Black et al; 2003). According to the authors, over the period 1960 to 1970 an average real growth rate of 5,8 percent per annum was recorded. The authors add that during the period between 1980 and 1990 the growth performance had deteriorated and an average real growth rate of only 1,5 percent was achieved. Since the late 1960s, South Africa has been experiencing inflation (Smit et al; 1996) According to the authors, this combined with poor monetary and fiscal policies in a world of increasing political immunity and sanctions due to South Africa's apartheid policies, led to large domestic debts in the 1980s. If we look back, in 1960 real per capita government spending in the Republic of South Africa was R 1,703 at

constant 2000 prices. By 2007 real per capita spending had more than tripled to R 7,959. During the same period real per capita gross domestic product (GDP) increased from R 15,938 to R 25,414 at constant 2000 prices, or by only 60% (Alm & Embaye; 2010).

From the year 2000, South Africa enjoyed relatively strong economic growth (New Growth Path; 2010) According to the analysis in the New Growth Path, despite the volatility of the 1990s, overall economic expansion between 1994 and 2008 approached 4 percent, more or less the same as other upper-middle income countries. In contrast, from the late 1970s to the early 1990s, South Africa's economic growth lagged its peers, running at just over 1 percent a year. New Growth Path (2010)

According to the New Growth Path (2010), despite improved growth, the economy remained one of the most inequitable in the world. In the mid 2000, 40 percent of the national income went to the richest 10 percent of households. Deep inequalities were associated with extraordinarily high levels of joblessness. In the late 2000s, less than half of all working-age South Africans had income earning employment, compared to an international norm of almost two thirds. New Growth Path (2010)

In summary, the study notes the difficulties that South Africa has faced during the dark days of apartheid, and equally recognises the difficult situation the government faces in trying to overcome the legacy of apartheid. In the next section of our study, we will look at the policies that are available to South Africa in its quest to change people's lives for the better.

3.2.2 Fiscal Policy in South Africa

Public economics is the study of the nature, principles and economic consequences of expenditure, taxation, financing and regulatory actions undertaken in the non-profit making government sector of the economy (Black et al; 2003). According to the authors, the main areas of decision making, (i.e. expenditure, taxation, financing, and regulation) are also called the 'instruments

of fiscal policy'. The authors add that, the first three instruments entail the procurement by the state of private funds and the spending of these funds. For our purpose, fiscal policy will be defined as national government decisions regarding the nature, level and composition of government expenditure, taxation and borrowing, aimed at pursuing particular goals.

A nation has a wide variety of policy instruments that it can use to pursue its macroeconomic goals. Firstly, we consider fiscal policy. Fiscal policy consists of government expenditure and taxation. Government expenditure influences the relative size of collective as opposed to private consumption (Nordhaus & Samuelson; 1995). According to the author, taxation subtracts from incomes and reduces private spending; in addition, it affects investment and potential output. Fiscal policy affects total spending and thereby influences real GDP and inflation. Monetary policy, conducted by the South African Reserve Bank, determines the money supply. Changes in the money supply move interest rates up or down and affect spending in sectors such as business investment, housing, and net exports. Monetary policy has an important effect on both actual GDP and potential GDP. Incomes policies are government attempts to moderate inflation by direct steps, whether by verbal persuasion or by legislated wage and price controls (Nordhaus & Samuelson; 1995).

The notion that governments have an important stabilization function to fulfil is associated primarily with the Keynesian school of macroeconomic thought (Black et al; 1999). According to the authors, the Keynesian approach to stabilization rests on three premises:

- The market economy is inherently unstable;
- Macroeconomic instability is a form of market failure which is highly costly to an economy; and
- Governments are able to stabilize the economy by means of appropriate fiscal and monetary policies

Keynesians therefore propose active counter-cyclical policies to stabilize economic activity (Black et al; 1999). According to the authors, their proposed policies mainly work on the demand side of the economy. In times of a recession, governments should reduce taxes, increase their expenditures, and boost credit expansion in order to raise aggregate demand and stimulate economic. Conversely, inflationary overheating of the economy should be addressed by higher taxes and lower levels of state spending and credit demand (Black et al; 1999). During a recession, it is possible to stimulate the economy through expansionary fiscal policies (Kandil; 2006). The author points out that, higher demand is likely, in turn, to stimulate output growth and price inflation. Conversely, during a boom it is possible to curb excess demand through contractionary fiscal policies. Demand reduction is likely, in turn, to moderate output growth and price inflation (Kandil; 2006),

The effectiveness of fiscal policy is highly dependent on the effects of government spending in crowding out private spending (Kandil; 2006). According to the author, in theory, a dollar increase in government spending that is financed by an equal increase in taxes increases aggregate demand and, hence, economic activity. That is, the balanced budget multiplier is positive. An increase in government spending that is not matched by an equal increase in taxes creates budget deficit. The way in which the deficit is financed has important implications for economic activity. Specifically, the effectiveness of an increase in government spending is likely to be enhanced the less the government debt and the higher the degree of monetization (Kandil; 2006).

The way in which government finances its expenditure also has important economic consequences (Black et al; 1999). According to the authors, the kind of taxes used and the rates levied influence the well-being (utility) of individuals and the decisions by private business regarding the allocation of resources in the private sector. The authors add that the tax system can promote or obstruct efficiency and equity. Traditional methods of financing government spending have included taxes, borrowing domestically or from abroad, and monetization. The latter approach attempts to avoid the political unpopularity of raising taxes and growing concerns about mounting public debt. Hence, the central bank

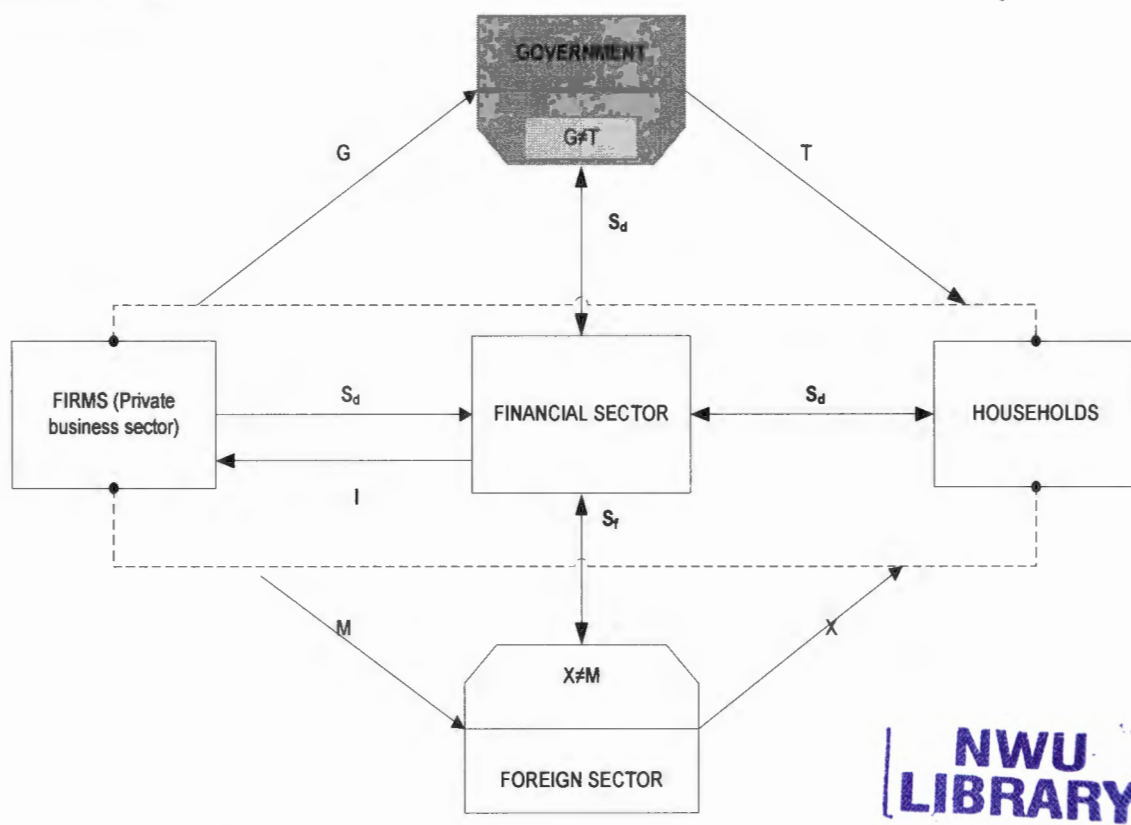
accommodates the increased government spending by issuing more credit, creating an increase in the monetary base (Kandil; 2006)

In the standard Keynesian model, the direct effects of a rise in government spending is to raise aggregate demand, and hence to raise the price, and output levels (Ghura; 1995). According to the author, an increase in government spending would be inflationary, especially if the resulting higher budget deficit is largely monetized. The author points out that the effect of a higher deficit on output growth is ambiguous, depending in part on the private sector's perception of the sustainability of this higher deficit. If the private sector expects an increase in future tax liabilities, capital accumulation would slow down because of lower expected real returns on investment (Ghura; 1995)

Ricardian consumers may anticipate a future increase in taxes if government spending is financed by increasing debt according to (Kandil; 2006). That's why private consumption may decrease, offsetting the positive effect of an increase in government spending on aggregate demand. Similarly, an increase in government spending that is financed by debt increases the demand for domestic credit, raising the interest rate. The higher the public debt, the higher is the risk premium in interest rates. In addition, financing government spending by borrowing from domestic financial institutions decreases available credit for the private sector. Accordingly, higher government spending is bound to crowd out private investment (Kandil; 2006).

According to National Treasury documents, South African government debt jumped from R627 billion (about 27.1% of GDP) in 2008 to R1.2 trillion (39.3% of GDP) in 2011. (Andile Ntingi:City Press 30 Oct 2011) According to the author, over the next few years, it is expected to rise to R1.7 trillion in 2015, about 42.4% of the GDP. In response to the global recession, the government hiked its spending to keep the South African economy afloat, and keep it from sinking into a deep hole (Andile Ntingi:City Press 30 Oct 2011).

Figure. 5: Circular flow of income in South Africa (impact of a budget imbalance)



The four economic sectors, (i.e. the household, business, government, and private sectors) have roles of varying importance in a country's economy, depending on the economic system in that country (Smit et al; 1996).

The size of government in the mixed economy is such that its purchases of goods and service exert important influences on the economy (Black et al; 1999). According to the authors, at the sectoral level, for instance, government spending is often decisive for the construction and engineering sectors. Often private investment cannot be undertaken unless the necessary public infrastructure is in place (e.g. roads and electricity networks). The authors add that at a macroeconomic level, changes in the aggregate level and composition of government expenditure are important factors in determining economic stability and growth. Excessive expenditure growth can for example be inflationary or crowd-out private investment, thus retarding economic growth (Black et al; 1999).

If there is a budget imbalance (surplus or deficit), the government exercises an influence on the balance between saving (S) and investment (I), or on the

balance of payments (i.e. the balance between exports (X) and imports (Z) (Black et al; 1999). This is shown in Figure 6. In national accounting terms, a budget imbalance (i.e. $G \neq T$) is reflected in either an imbalance between private investment (I) and saving (S), that is, $S \neq I$ (internal imbalance) or an imbalance between exports (X) and imports (Z), that is, $Z \neq X$ (external imbalance of payments disequilibrium).

If there is a budget deficit, tax revenue (T) is less than government expenditure (G), or $T < G$, and the government has to borrow (Black et al; 1999). According to the authors, the size of the deficit and the way in which it is financed is very important for macroeconomic stability, depending on one's view of the impact of budget deficits on the economy. The authors add that, while the government can influence the course of the economy, it is also extensively affected by what happens in the economy. The authors use an example of a recession, and note that during a recession, government revenue falls or grows at a slower rate. This may impair its ability to provide public services, especially if its debt or budget deficit is already relatively high. According to the authors, government also endures the most of its own decisions via their adverse effect on the economy, such as when high budget deficits result in higher interest rates, thereby increasing the governments' interest bill (Black et al; 1999).

South Africa's recent economic history has been dominated by balance of payments problems of one kind or another (Mohr & Rogers; 1998). Between 1946 and 1976, South Africa could generally afford to run deficits (amounting to about 3 percent of GDP) on the current account of the balance of payment (Mohr & Rogers; 1998). According to the authors, these deficits were largely financed by net inflows of foreign capital. During this period, the country could sustain large levels of domestic expenditure significantly in excess of domestic production (Mohr & Rogers; 1998).

During the 1970s and early 1980s, governments in many countries in Sub-Saharan Africa (SSA) pursued macroeconomic policies that were inconsistent with a policy of fixed nominal exchange rates. Expansionary monetary and fiscal policies were frequently pursued, with the nominal exchange rate kept unchanged over protracted periods. Consequently, in many instances, these

policies resulted in high rates of inflation, overvalued real exchange rates, high levels of foreign debt, significant trade deficits, and sluggish overall output growth. Increasingly, macroeconomic stability is recognized as a necessary condition for sustainable economic growth (Ghura; 1995)

During the 1980s, the limited success and potential of export promotion and further import substitution as well as the intensification of trade and financial sanctions gave rise to a renewed focus on domestic demand as a major source of industrial development (Mohr & Rogers; 1998). In the 1980, the NP began to advocate and implement a more market-oriented economic program, especially in respect of monetary, exchange rate and labour market policy. Political resistance, township boycotts and militant strikes weakened this early neoliberal experiment, which was pioneered in the first half of P.W. Botha's rule.

Most economist nowadays agree that the observed changes in the nature of economic fluctuations since the early seventies can be attributed to a number of major disturbances, shocks, and including the sharp increases in international oil prices in 1973-1974 and 1979. Large swings in the price of gold (in US dollars), the South African-Angolan conflict, domestic social and political disturbances such as those of June 16 1976, July 1985 and June 1986 and the associated increase in uncertainty, increased international political and economic pressure on the South African government, the severe and prolonged drought of the 1980s, the foreign debt disaster and the collapse of the rand in 1985 (Mohr & Rogers; 1998). According to the authors, there is a measure of disagreement as to the implications of these disturbances for the South African business cycle.

The study notes that according to (Sun et al; 2011), large developing countries, and emerging economies, typically Brazil, Russia, India, China, and South Africa (BRICS), demonstrate a strong upward trend in many aspects of their macroeconomic performance in recent decades. For years, or at least up to the middle of the 1970s, the focus of macroeconomic (including fiscal policy) in industrial and developing countries was short-term in nature (Black et al; 2011). According to the authors, the concern was with preserving macroeconomic stability and pursuing the highest possible level of economic growth and

employment commensurate with such growth. The authors add that it was realised that, in both industrial and developing countries, short-term stabilisation policies were no longer sufficient to address the structural economic problems of unemployment, low growth, and high inflation.

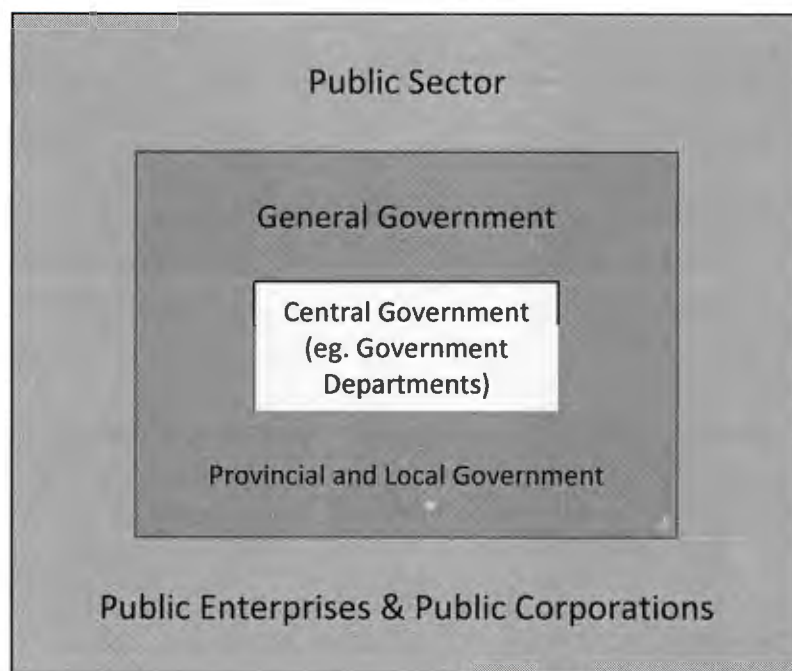
Gradually the emphasis in economic policy-making shifted from an excessive reliance on stabilisation policies, to economic strategies combining stabilisation measures and measures of structural reform (Black et al; 2011). According to the authors, these policy measures are aimed at increasing the growth and job creation capacity of the economy. Some of these measures include, but are not limited to, lower budget deficits, stricter expenditure discipline, tax reform measures, and job creation programmes.

We end this section by noting that, according to (Black et al; 2011), generally, developing countries that have incorporated these kinds of fiscal measures in their economic reform programmes appeared to have had more success in effecting sustainable economic growth. However, the international financial crisis of 1997-1998, revealed important shortcomings in the regulatory role of governments (Black et al; 2011). The study therefore notes that the use of economic strategies, and by using prudent fiscal measures, which combine stabilisation and structural reform measures, is the way to go, if South Africa is to create jobs and economic growth in the long term.

3.3 Composition of Government Spend in South Africa

The South African Constitution specifies three spheres or levels of government (Black et al; 2011). The central or national government (see inner rectangle in Figure 7), consists of all the national government departments. The core of the public sector is central government (Mohr & Fourie; 2004). According to the authors, central government includes all the different government departments, extra-budgetary agencies such as the Council for Scientific and Industrial Research, the South African Bureau of Standards, the National Health Laboratory Services, and Universities.

Figure 6: Composition of Government Spend in South Africa



The second and third tiers of government in South Africa constitute nine provincial governments and 283 local authorities (Black et al; 2011). General government is obtained by adding provincial government and local government. These are shown in the second rectangle in Figure 7. Together with the central government, the general departments of provinces and local authorities are constituent components of the general government. Provincial government includes the administrations of the nine provinces, and local government includes metropolitan councils, municipalities and district councils (Mohr & Fourie; 2004).

The final level is the public sector, and it includes the general government, the public corporations and other state enterprises (Mohr & Fourie; 2004). This category of public entities (see outermost rectangle in Figure 7) consists of financial and non-financial public enterprises such as Eskom. Mossgas, the South African Broadcasting Corporation, Telkom, Transnet, the Land Bank, and the Public Investment Corporation (Black et al, 2011).

The South African government or public sector consists of the following:

- Central government, which is mainly concerned with national issues such as defence and our relationship with the rest of the world (i.e. foreign affairs)
- Regional (or provincial) government which is mainly concerned with regional issues such as, housing, health services and education
- Local government which deals with local issues such as the provision of sewerage, local roads, street lighting and traffic control
- Public corporations and other government business enterprises such as Eskom, Telkom, Transnet and Rand Water (Mohr, 1995)

The general departments (not business enterprises) of central, provincial and local government together form the general government (Mohr, 1995). The general government plus the public corporations and other government enterprises form the public sector. For the most part, general government thus represents the non-profit activities of the public sector (Black et al; 2003). The allocation of resources is determined by political considerations and financed through the tax system (or loans which have to be repaid out of taxes at a later stage) (Black et al; 2003). According to the authors, we refer to the three tiers of government (i.e. the general services and business enterprises of national, provincial and local government) as the general government, and to the combination of general government and public corporations as the public sector.

The size of the public sector differs according to the indicator used (Black et al; 2003). The author says that if we are interested in the size of the burden, which the government imposes on current taxpayers, we may use the total tax income of the general government as an indicator, and express it as a percentage of the gross domestic product or national income. By this criterion, the government's share in the South African economy in 1960 was 14,2 percent, and by 2001 was 27,3 percent (see Table 3). In addition, we realize that, government expenditure is not only financed through tax revenue, but by means of non-tax income (such as dividends, property income, mining leases and administrative fees), as well as borrowing (loans).

Table 3: Average size of the South African public sector by different measures

Measure	1960	1960-69	1970-79	1980-89	1990-99	2001
Taxes (direct and indirect)	14.2	15.8	19.1	22.9	25.1	27.1
Resource use (1), of which	17.8	20.9	28.1	27.0	24.1	21.2
General government consumption ^a	9.5	11.3	14.6	18	19.2	18.2
Investment ^b , of which	8.3	9.6	13.5	9.0	4.9	3.2
General government	7.0	7.6	8.7	5.3	2.6	1.8
Public corporations	1.3	2.0	4.8	3.7	2.3	1.4
Transfer payments (2), of which	3.9	4.2	5.9	8.9	11.5	10.6
Interest on public debt ^c	0.7	1	1.9	4	5.8	5.5
Subsidies and current transfers ^d	3.2	3.2	4	4.9	5.7	5.1
Total public sector resource mobilisation (1) + (2), of which	21.7	25.1	34	35.9	35.6	31.8
General government	20.4	23.1	29.2	32.2	33.3	30.5
Public corporations	1.3	2.0	4.8	3.7	2.3	1.4

Notes:

^a - National accounting figures

^b - Gross fixed investment or capital formation

Source: South Africa Reserve Bank, Quarterly Bulletin, various issues, (Black et al; 2003)

In Table 3, we get a better picture of the total amount *resource use* by (i.e. the final demand by, or exhaustive expenditure of) government in any year if we measure its size from the expenditure side. The total spending of the public sector (consumption and investment spending – or capital formation – valued at market prices) has increased from an average 20.9 percent of gross domestic product (GDP) over the period 1960-1969, to an average of 24.1 percent for the period 1990-1999. In 2000 this ratio was 21.2 percent. This however, is still not the entire picture, since not all of government expenditure is in the form of final demand for goods and services. The government also makes transfer payments to targeted beneficiaries or entities (i.e. subsidies, current transfers, interest on public debt – these are also known as non-exhaustive expenditures). The government mobilises the resources, but they are used by the recipients who exercise the final demand (Black et al; 2003). If we add interest payments and transfers to the households, business and foreign sector, we should get a better picture of the extent of *resource mobilisation* by the government. In 1960, the

South African public sector mobilized 21.7 percent of the national resources, and in 2000, the public sector was instrumental in mobilizing 31.8 percent of the national resources.

Table 4: Public Debt-GDP ratio in South Africa by sub-period 1969-2001

Period	Average public debt as percentage of GDP
1969-1972	44.3
1973-1979	38.3
1980-1988	31.9
1989-1993	38.5
1994-1999	49.3
2000-2001	46.8
Source: South African Reserve Bank, <i>Quarterly Bulletin</i> (from Black et al: 2003)	

The decisions of government about the allocation and distribution of resources, is embodied in its fiscal policy and reflected in its budget (Black et al; 2003). According to the authors, public debt arises from the borrowings of government. Public debt arises primarily from the government's annual budget deficits. The majority of public debt is incurred through the sale of government bonds (also called stock or securities) with a maturity of more than three years. All government bonds are regarded as liquid assets in the hands of banks (Black et al; 2003). According to the authors, occasionally debt is incurred outside the budget (off-budget debt), and not reflected in the budget deficit. For example, in the early 1990s, the government transferred bonds directly to the public employees' pension funds to improve their funding levels, instead of budgeting for it in the normal way.

During the period 1970 to 2000, foreign public debt as a percentage of total public debt fluctuated between 10.9 percent (1976) and 1.6 percent (1992). Over this period, foreign debt never exceeded 4.3 percent of GDP (Black et al; 2003). According to the authors, in 1985, 1986, and 1987, foreign loans were used counter private capital outflows, but access to the international financial markets

was normalised only in 1994. In 2001, the total debt (public debt) of the South African government amounted to R462 billion, which was 50.7 percent of the GDP (Black et al; 2003).

In an article posted in City Press Business, on 30 October 2011, it reported Treasury director-general, Lungisa Fuzile sounding warnings of an eminent increase in taxes if state debt does not come down. According to Lungisa Fuzile, government debt has jumped from R627 billion in 2008, (about 27.1% of GDP), to R1.2 trillion this year (about 39.3% of GDP). Over the next three years it is expected to reach R1.7 trillion (about 42.4% of GDP) in 2015. According to one economist Dawie Roodt, a debt position of around 40% of the GDP was manageable, but there could be trouble if it is allowed to climb above 50%.

From 2012, according to Fuzile, state spending will reach the trillion rand mark for the first time, climbing to R1.1 trillion from R979 billion in 2011. Commentators agree with treasury, that South Africa would not fall into a Greek-type of debt quagmire, but warned government to take a close look at the escalating wage bill. Wages account for about 40% of government spending, up from 32% in 2010, according to Fuzile. The increase in the wage bill needed to be curbed and more financial resources redirected towards improving South Africa's transport infrastructure and stimulating the economy to create jobs through supporting the manufacturing sector and Industrial Development Zones (IDZ's). Local economist Dawie Roodt, noted that the R1 trillion spending threshold was a reflection of the state increasing its role in the economy, and added that rising inflation had also pushed spending to this new threshold.

In June 2012, in response to union demands of a 9% salary increase, The Minister of Public Administration, Lindiwe Sisulu mentioned that the public service wage bill had risen sharply - from R211-billion in 2009 to R314.9-billion last year. Echoing the same concerns made by Lungile Fuzile. In 2012, the government expected a shortfall or deficit of R164 billion (about 5.5% of GDP) in its budget, which is going to be financed through borrowing. According to Fuzile, South Africa's bond markets, which will be the primary source of financing in the medium term, remain healthy, liquid and deep. Fuzile goes on further to explain

that, Treasury documents indicated that government expected to collect more revenue over the next three years. The state anticipates that a collection of R890 billion next year, swelling its coffers to R1.1 trillion in 2015. Fuzile adds that as the economy and the revenues improved, the budget deficit was expected to lessen to R134 billion in 2015, about 3.3% of GDP.

In summary, because of the diverse nature of government activities and the corresponding differences in the factors that determine the allocation and distribution processes in the public sector, we are not only interested in the aggregate size of the public sector, but also in its constituent components. This section has shed light on a few of the more salient issues regarding the composition of the public sector. In the next section we will take a look at the size and growth of government spending in South Africa.



3.3.1 Size and Growth of Government Spending in South Africa

The South African budget has always been used as a distributive device, and given our history, race and ethnicity have always played a big role (Black et al; 2003). For the purpose of our analysis, trends in the size and growth of general government expenditure are summarised in Table 5. The table shows that expenditure grew relative to gross domestic product (GDP). In Table 5, data is provided for two measures of expenditure, namely the total amount of resources used and the total amount of resources mobilized. We also note that the past four decades saw increases for resources used and mobilized by general government. General government expenditure as a percentage of GDP, increased from 16.6 percent 19.8 percent, and resource mobilisation as a percentage of GDP increased from 20.5 percent in 1960 to 30.5 percent in 2001.

Table 5: The Size and growth of general government expenditure in South Africa 1960 -2001

Measure	1960	1960-96	1070-79	1980-89	1990-99	2001
Percentages of GDP (current prices):						
Resource Use	16.6	18.9	23.3	23.3	21.8	19.8
Resource Mobilisation	20.5	23.1	29.1	32.2	33.3	30.5
Growth Rates (1995 prices):						
Resource Use	-	7.2	3.9	2	0.7	-
Notes: a National accounting figures Source: Calculated from SA Reserve Bank, <i>Quarterly Bulletin</i> (various editions)						

In addition, the average portions of GDP used by general government increased in each consecutive decade from 1960 onwards. Although the amount of resources used grew in real terms throughout the period, it can be seen that the average rate of growth decreased in each consecutive decade since the 1960 (Black et al; 2003).

This study notes that, the resource-use share of government in the economy increased over the period 1960-2001, and according to (Black et al; 2003), reflecting an even larger decrease in the long-term real economic growth. This is very important for our analysis, as this will be examined in Chapter 5, when we analyze data. The growth in general government expenditure was accompanied by significant changes in its composition, and this will be discussed in the next section

3.3.2 Changes in Composition of Spend in South Africa

In South Africa, there was a rapid increase in government spending during the first half of the 1970 (Mohr & Rogers; 1998). According to the authors, this formed part of the period which (Browne; 1983) has termed the 'years of fiscal expansion' where both consumption and investment spending by the South African government increased rapidly, and together they increased from 19.6

percent of gross domestic expenditure (GDE) in 1970, to 25.1 percent in 1976. The authors add that the 1976 Budget Speech heralded the start of a new era in South African public finance, when the then Minister of Finance introduced a restrictive Budget, and

This major policy switch to financial discipline resulted in a significant slowdown in the rate of increase in government expenditure and a concomitant decline in government's share of GDE (Mohr & Rogers; 1998; Black et al; 2003). The relatively rapid expenditure growth in 1971, 1972, and again in 1975, coincided with the downward phases of the business cycle (Black et al; 2003). However, the belief in counter cyclical fiscal policy began to diminish (i.e. the real GNP actually declined) in spite of the lowest growth rate since the Second World War (Mohr & Rogers; 1998). After some success in curtailing government expenditure, the ratio of general government expenditure to GDP increased consistently and reached 23.4 percent in 1985 (Black et al; 2003). The curtailment of investment spending by public authorities between 1976 and 1980 had severe implications for certain industries, especially construction (Mohr & Rogers; 1998).

A large portion of consumption expenditure by general government consists of wages and salaries (Mohr & Rogers; 1998). According to the authors, in 1976 and 1977 there were significant real declines in the average remuneration of public sector employees, and this contributed to slower growth in government spending. The authors add however, that this wage discipline could not be maintained, because from 1981 onwards, public spending once more increased as a percentage of GDP. Overspending declined during the latter part of the 1980s. In 1990 and 1991, the Minister budgeted for contingency reserves of R1 billion and R2 billion respectively (Mohr & Rogers; 1998). According to the authors, to limit overspending even further, a separate Department of State Expenditure was created in 1991. By 1993/94 this step showed clear signs of success. However, in 1994/95 the elections and the transition to a new constitution and new government resulted in renewed overspending which had to be financed by raising a 5 percent transition levy. The TBVC (Transkei, Bophuthatswana, Venda, and Ciskei) states were also re-included in the 1994/95 budget. According to the authors this means that direct comparisons with the situation up to and including 1993/94 financial year, will not be possible in future.

Table 6: The economic composition of general government expenditure in South Africa 1960-2001 (percentage of total expenditure)^a

Item	1960	1960-69	1970-79	1980-89	1990-99	2001
Remuneration of employees	35.7	32.5	27.4	31.0	40.1	41.3
Other goods and services	11.0	16.4	22.8	24.9	17.8	17.7
Consumption	46.7	48.9	50.2	55.9	57.8	59.0
Interest on Public debt	3.3	4.3	6.5	12.3	17.3	18.0
Subsidies	3.6	3.8	4.1	5.6	4.2	1.8
Current transfers:						
Households	11.8	10.0	8.5	8.2	11.3	12.9
Current transfers:						
The world	0.3	0.2	0.9	1.5	1.7	2.4
Current Expenditure	65.7	67.1	70.2	83.5	92.3	94.0
Investment^b	34.3	32.9	29.8	16.5	7.7	6.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Notes: a National accounting figures at current prices						
b Gross capital formation						
Source: Calculated from SA Reserve Bank, <i>Quarterly Bulletin</i> (various issues)						

The economic arrangement of government expenditure distinguishes between the current and capital components of total outlays (Black et al; 2003). Table 6, shows that the portion allocated to current expenditure increased significantly from 1960 to 2001 (from 65.7% to 94.0%), with a matching decreases in the capital expenditure share of total outlays. Over the period 1960-2001 as a whole, the growing share of current expenditure mainly reflected increases in the payment of interest on the public debt (from 3.3% in 1960, to 18.0 % in 2001). The value of 'other goods and services' (e.g. stationery, computers, vehicles and maintenance of capital assets increased from 11.0 % to 17.8 %), and the government's wage bill/ remuneration went up from 35.7 % to 41.3 % during the period.

The share of current transfers to households, mainly social pensions also grew during the nineties, but returned to the share that prevailed before the sharp decreases that occurred during the 1960s and 1970s. According to (Black et al; 2003), these trends should be interpreted against the background of the overall increase in general government spending.

3.4 Summary

In conclusion, we have given a brief insight into the South African economy, and have showed how the issues related to fiscal policy and growth has been, and continues to be addressed in South Africa. The next section will address the research methodology to be employed for the purpose of our analysis.

Chapter 4

4. Research Methodology

4.1 Introduction

This chapter discusses the research methodology employed in this effort in full detail. The chapter consists of five sections. The first section outlines the chapter. The second section introduces econometric models. The third section, data description, explains all areas concerning the formulation and use of data in the overall study, including the sources of data and information. The fourth section gives a description of the model used in the study in full detail, and explains the models, techniques, and methods used to undertake the study. Section five is a summary

4.2 Econometric Models

Theoretical economics may suggest that there is a relationship between two or more variables, but applied economics demands both evidence that this relationship is a real one, observed in everyday life, and quantification of the relationship between the variables (Asteriou & Hall; 2011). According to the authors, economic data sets come in various forms. While some econometric methods can be applied straightforwardly to different types of data set, it is essential to examine the special features of some sets (Asteriou & Hall; 2011).

Macro econometric models differ enormously in size. The smallest model may be a single equation that estimates how the level of GDP relates to the money stock and government spending. In a macro econometric model specific numerical values are estimated for each of the various parameters, for instance, the marginal propensity to consume, the marginal propensity to import, the interest elasticity of investment demand, and the interest elasticity of the demand for money) based on the past behaviour of the economy.

Time series data sets consist of observations of one or more variable over time (Asteriou & Hall; 2011). Time series data are arranged in chronological order and

can have different time frequencies, such as biannual, annual, quarterly, monthly, weekly, daily and hourly. Examples of time series data include stock prices and gross domestic product (GDP). Time series data are denoted by the subscript t . So, for example, if Y denotes the GDP of a country between 1983 and 2010 we denote as:

$$Y_t \text{ for } t = 1, 2, 3, \dots, T \quad \text{Where } t = 1 \text{ for 1983 and } t = 27 \text{ for 2010}$$

4.3 Data Description

The study uses time series to examine the relationship between government expenditure and economic growth in South Africa during the period 1980 to 2011. Data for GDP is calculated annually at market prices, and is obtained from the (SARB) website. The data is collected so that estimation can reflect a true value of the series. The data for government expenditure is collected annually using total expenditure by national government. The data collected is secondary data downloaded from the (SARB) South African Reserve Bank, and the study holds no accountability if the data that is downloaded is inadequate

4.4 Model Description



The study estimates the relationship between government expenditure and economic growth using the notion, that there is a long-run tendency for the public sector to grow relative to national income or vice-versa. This has been an issue in economics. The study estimates the relationship between economic growth and government expenditure using the following model:

$$GDP_t = \beta_0 + \beta_1 GEX_t + e_t \quad (1)$$

$$GDP_t = \beta_0 + \beta_1 GEX_t + \beta_2 CAPI_t + e_t \quad (2)$$

Where Y_t is the dependent variable β_0, β_1 , and β_2 are the coefficients or parameters of variables, and e_t is a stochastic process. For this study, Y_t is the series of gross domestic product (GDP) which is frequently termed economic

growth, GEX_t is total general government expenditure, while $CAP I_t$ is gross fixed capital formation by general government on construction works, and e_t is the error term. For the purpose of this study, we test both the Engle-Granger technique for our simple two variable model, as well the Johansen cointegration test for our multivariate model.

4.4.1 Unit Root Tests

For this study, prior to estimation of any time series model, the first step is to check the stationarity of variables used as regressors in the model. The aim is to verify whether the series has a stationary trend, and, if non-stationary, to establish orders of integration.

Many macroeconomic time-series contain unit roots (dominated by stochastic trends) Chang et al. (2004) Unit root tests are important in examining the stationarity of a time series because the presence of non-stationary regressors invalidates many standard hypothesis tests. The authors add that, the F-statistic calculated from a regression involving non-stationary time-series data does not follow the standard distribution. The actual distribution is non-standard and, compared to the standard distribution, has a substantial rightward shift under the null hypothesis of no causality. Consequently, the significance of the test is overstated and a spurious result obtained. The presence of a stochastic trend is determined by testing the presence of unit roots in time-series data.

4.4.1.1 Augmented Dickey-Fuller Test

Dickey and Fuller (1979, 1981) devised a formal procedure to test for non-stationarity (Asteriou & Hall; 2011). According to the authors, the key insight of their test is that testing for non-stationarity is equivalent to testing for the existence of a unit root. The Dickey-Fuller (DF) test for stationarity is then simply the normal t -test on the coefficient of the lagged dependent variable Y_{t-1} . This test does not, however, have a conventional t -distribution and therefore, we must use

special critical values originally calculated by Dickey and Fuller. McKinnon (1991) tabulated appropriate critical values (Asteriou & Hall; 2011).

According to the authors, the test focuses on whether $y = 0$. The DF test statistic is the t -statistic for the lagged dependent variable. If the DF statistical value is smaller than the critical value, then the null hypothesis of a unit root is rejected and we conclude that Y_t is a stationary process. Dickey and Fuller extended their test procedure by suggesting an augmented version (Augmented Dickey-Fuller - ADF) of the test that includes extra lagged terms of the dependent variable in order to eliminate autocorrelation. The ADF test is given by the following equation:

$$\Delta Y_t = a_0 + \gamma Y_{t-1} + a_2 t + \sum_{i=1}^p \beta_i \Delta Y_{t-1} + u_t \quad (3)$$

This procedure is the most sensible way to test for unit roots when the form of the data generation is unknown. This test is appropriate and relevant for our study, and is utilized later when data is analysed.

4.4.1.2 Philips-Perron (PP) Test

Distribution theory supporting the DF and ADF tests is based on the assumption that the error terms are statistically independent and have a constant variance. This means that when using ADF methodology, one has to make sure that the error terms are uncorrelated and that they really do have a constant variance (Asteriou & Hall; 2011). According to the authors, Philips and Perron (1998) developed a generalization of the ADF test procedure that allows for mild assumptions concerning the distribution of errors. The following equation is the test regression for the Philips-Perron (PP) test:

$$\Delta Y_{t-1} = \alpha_0 + \gamma Y_{t-1} + e_t \quad (4)$$

While the ADF test corrects for higher-order serial correlation by adding lagged differenced terms on the right hand side, the PP test makes a correction to the t -

statistic of the coefficient γ from 3 (equation 3) to account for the serial correlation in e_t . So in essence, the PP statistics are only modifications of the ADF t -statistic that take into account the less restrictive nature of the error process. Just like the ADF test, the PP test can be performed with the inclusion of a constant, a constant and a linear trend, or neither in the test regression. This test is also relevant for our study and will be employed later in the analysis of data section. The next section - cointegration test, will explain whether the series under study are cointegrated.

4.4.2 Cointegration Tests

Trended time series can potentially create major problems in empirical econometrics because of spurious regressions. The study notes that most macroeconomic variables are trended and therefore the spurious regression problem is highly likely to be present in most macroeconomic models. One way to solve this problem is to difference the series successfully until stationarity is achieved, and then use the stationary series for regression analysis (Asteriou & Hall; 2011). According to the authors, Granger (1981) introduced a remarkable link between non-stationary processes and the concept of long-run equilibrium, and this link is the concept of cointegration. Engle and Granger (1987) further formalised this concept by introducing a very simple test for the existence of cointegrating (the long-run equilibrium) relationships (Asteriou & Hall; 2011). Engle and Granger (1987) pioneered the area of cointegration tests, and they propose a two-step procedure to identify cointegration vectors. First, this approach runs an OLS regression on levels to produce residuals. Second, it conducts a unit root test for the null hypothesis of no integration relationship and against the alternative of a cointegration relationship between them.

4.4.2.1 Engle-Granger Cointegration Test

This study will follow the cointegration test as proposed by Engle and Granger (1987). The question behind this test is to observe whether there is some long-run equilibrium relationship between government expenditure and economic

growth. A linear combination may exist between two or more economic variables that converge to long run to long-run equilibrium, even though the series tend to move arbitrarily over time. In other words, they are cointegrated when each individual variable demonstrates stationarity only in the first difference, but a linear combination of their levels may result in stationarity. This study will also employ the use of the Johansen Cointegration Test, which we discuss briefly in the next section.

4.4.2.2 Johansen Cointegration

The first step in the Johansen approach, just as in the Engle-Granger technique, is to test for the orders of integration of the variables under study. The study notes that most economic time series are non-stationary and therefore integrated. Essentially, the issue here is to have non-stationary variables in order to detect among them stationary cointegrating relationships (Asteriou & Hall; 2011). The second step is finding the appropriate lag length. The issue of finding the optimal lag length is very vital since we want to have Gaussian error terms. The most well known procedure in choosing the optimal lag length is to estimate a VAR (Vector Autoregressive) model including all our variables in levels (non-differenced data). The VAR model estimates for a large number of lags, and thereafter, the model reduces down, this by re-estimating the model for one lag less until we reach zero lags.

Another important element in the formulation of a dynamic model is determining whether an intercept and/or trend should enter the short-run or the long-run model; represented by the following equation:

$$\Delta Z_t = \Gamma_1 \Delta Z_{t-1} + \dots + \Gamma_{k-1} \Delta Z_{t-k-1} + \alpha(\beta Z_{t-1} \mu_1 1 \delta_1 t) + \mu_2 + \delta_2 t + u_t \quad (4)$$

We determine the rank of Π , or the number of cointegrating vectors, and then we test for weak exogeneity. Lastly, we test for linear restrictions in the cointegrating vectors, for long run parameters for prediction.

4.4.3 Error Correction Model

An Error-Correction Model (ECM) is a way of combining the long-run, cointegration relationship between the levels variables, and the short relationship between the differences of variables. One advantage is that all the variables in the estimated equation are stationary, and OLS is valid; hence there is no problem with spurious correlation. Economists are mainly interested in long-run relationships, and therefore the concept of cointegration and the ECM are very useful to resolve this. What is of importance is that when two variables Y and X are cointegrated, the ECM incorporates not only short-run, but also long-run effects. This is because the long-run equilibrium is included in the model, together with the short-run dynamics captured by the differenced data. The ECM model is represented by the following equation:

$$\Delta GDP_t = \mu + \sum_{i=1}^{n-1} \alpha_i \Delta GDP_{t-i} + \sum_{i=0}^{m-1} \gamma_i \Delta GEX_{t-i} - \pi \hat{e}_{t-1} + \varepsilon_t \quad (5)$$

Where π is the error-correction coefficient and/or the adjustment coefficient, and ε_t is our equilibrium error. π , tells us how much of the adjustment to equilibrium takes place in each period, or how much of the equilibrium error is corrected. The level terms of GDP_t and GEX_t in the ECM tells us exclusively about the long-run parameters of the two variables. Equation (5) is the ECM representation, it allows us to use both long-run information, and short-run disequilibrium dynamics which are very useful for our analysis, and this is a very important feature of the ECM.

4.4.4 Causality Tests



One good feature about VAR models is that they allow us to test for the direction of causality. Causality in econometrics is different from the concept used every day (Asteriou & Hall; 2011). In our study it refers more to the ability of one variable to predict (and therefore cause) the other. According to (Asteriou & Hall; 2011), Granger (1969) developed a relatively simple test for causality, and observed that a variable y_t is said to Granger cause x_t if x_t can be predicted with greater accuracy by using past values of the y_t variable, rather than not using

such past values, provided all other things remain constant (*ceteris paribus*). The problem is to find an appropriate procedure that allows us to test and statistically detect the cause and effect relationship among the variables under study. For the purpose of our research, we present the Granger causality test below.

The technique is applied in the next chapter, to observe whether a causal relationship between government expenditure and economic growth exists. One of the aims of our study is to determine whether a causal relationship exists between the variables under study, and therefore the results of this test will be extremely important. This test is very important for our study, and it has major policy implications for South Africa.

4.4.4.1 Granger Causality Test

A VAR model can capture the relationship between two variables. The Granger causality test for two stationary variables GDP_t and GEX_t involves the estimation of the following VAR model:

$$GDP_t = a_1 + \sum_{i=1}^n \beta_i GEX_{t-i} + \sum_{j=1}^m \gamma_j GDP_{t-j} + e_{1t} \quad (6)$$

$$GEX_t = a_2 + \sum_{i=1}^n \theta_i GEX_{t-i} + \sum_{j=1}^m \delta_j GDP_{t-j} + e_{2t} \quad (7)$$

The first thing to do is to estimate the VAR model given by equations (6) and (7). From then on, we check the significance of the coefficients, and apply variable deletion tests. Depending on the results of the variable deletion tests, we conclude about the direction of causality.

4.4.5 Diagnostic and Stability Tests

One way of detecting misspecification problems is by observing regression residuals (Asteriou & Hall; 2011). According to the authors, one assumption of the CLRM (Classical Linear Regression Model) is that the residuals are normally distributed with a zero mean and a constant variance. Residual tests, or

diagnostic tests involve testing the obtained residuals from the error-correction model, firstly for stationary by using ADF test in order to confirm the cointegrated characteristics of the variables in the model, and secondly testing the residuals allows us to verify statistical significance of the fitted regressed equation or model. Different residual tests have been used in this study and are treated in full in the next chapter.

4.4.5.1 Histogram and Normality Test

To check for normality of residuals in our regression model, we examine the histogram and JB (Jarque-Bera) statistic. This test produces a histogram of the residuals and the Jarque-Bera statistic for testing their normality. The Jarque-Bera test statistic tests whether variables are normally distributed in the model and the test measures the difference of skewness and kurtosis of series with those from normal distribution.

4.4.5.2 Serial Correlation Tests

There are many different types of serial correlation tests available. This study employs the Breusch-Godfrey LM-test in order to test for the presence/ absence of serial correlation in the residuals. The above-mentioned test is suitable for large samples and can detect higher serial correlation.

4.4.5.3 Ramsey Reset and Recursive Estimate CUSUM Test

Stability tests of a regression model are tests designed to evaluate whether the performance of a model in a prediction period is compatible with its performance in the sample period used to fit it. In this analysis the following two tests were used to test for the stability of the model: The Ramsey RESET and (CUSUM and CUSUM of Squares tests).

4.5 Summary

We have specified all the tools and techniques used in this empirical study. All the models and tests are appropriate, relevant, and ideal for our treatment of the relationship between government spending and economic growth. In the next chapter we analyse data using all the tools and techniques specified in this chapter.

Chapter 5

5. Data Analysis and Interpretation

5.1 Introduction

This chapter presents all the results of testing the fiscal-policy-growth nexus, for the period 1980 to 2011. The interpretation and analysis is with regard to the relationship between government spending and economic growth. Data obtained from the SARB (South African Reserve Bank) is analyzed and treated using the following tools and techniques, namely, unit root tests depicted by, ADF unit root tests, and tests for cointegration and ADF test on residuals. A great deal can be learnt from a preliminary analysis of the data

5.2 Analysis of Results

The starting point of a time series analysis is a visual inspection of time plots of GDP and Government spending. Data obtained from the SARB (South African Reserve Bank) is analysed and treated using the following tools and techniques, namely, ADF unit root tests, tests for cointegration, as well as tests for residuals. Phillips Perron, Johansen, and Engle Granger tests, are deployed in our analysis.

5.3 Visual Inspection/ Unit Root Test

A Unit root test is performed to see if variables are stationary. In this study, we use two macroeconomic variables time series. If the variables are stationary, we need to establish orders of integration. In this part, we analyse data for GDP at level, and then GDP at the first difference. In our model, we difference at the first level. The graphs that correspond are generated. Unit root is tested using correlograms, and hypothesis is tested as follows:

Where H_0 : non-stationary

H_1 : stationary

Figure 7.1 Graphical Representation of GDP at Levels

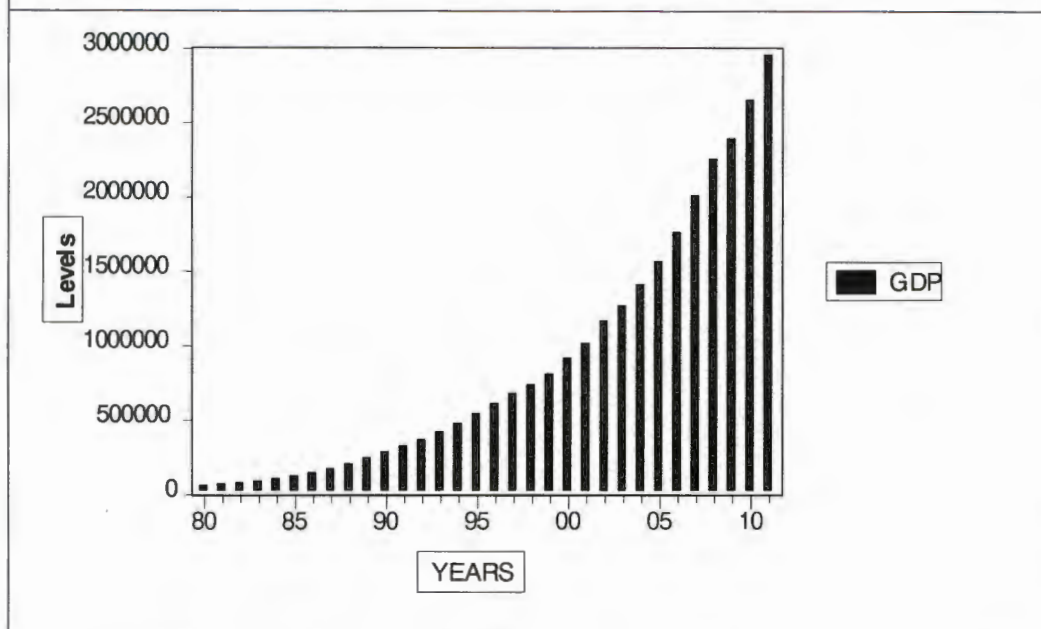


Figure 7.2 Graphical Representation of GDP at First Difference

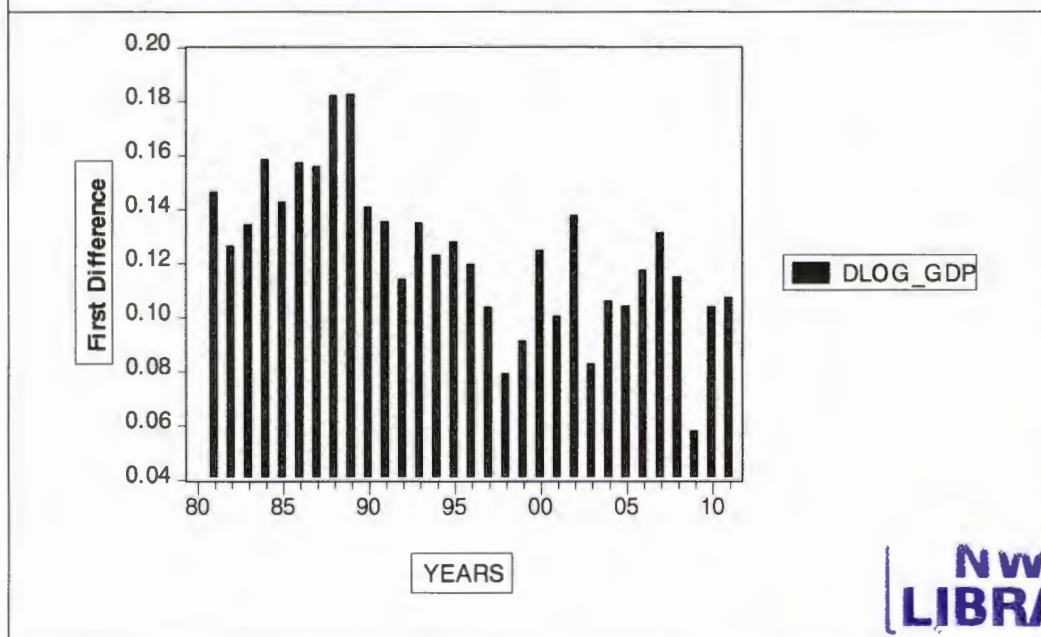


Figure 7.1 is a graphical representation of GDP at levels. Visual Inspection of the variables on the plot shows that GDP is non-stationary at levels, since it exhibits an upward trending curve. This means that its mean and variance are not constant. A non-stationary variable causes misleading results, and causes spurious regression results. In order to remedy this problem, differencing is performed. As can be seen in Figure 7.2 after differencing at the first level, the

series looks like it is stationary. This means that the series' mean and its variance, after differencing at level 1, are constant over time, and as a result the study rejects the *null hypotheses* of non-stationarity.

Figure 7.3 Graphical Representation of GEX at Levels

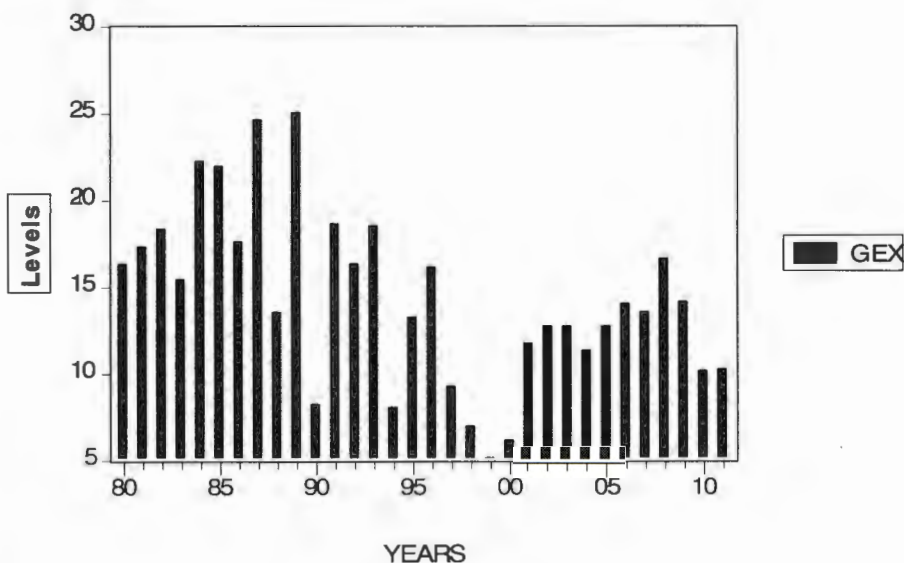


Figure 7.4 Graphical Representation of GEX at First Difference

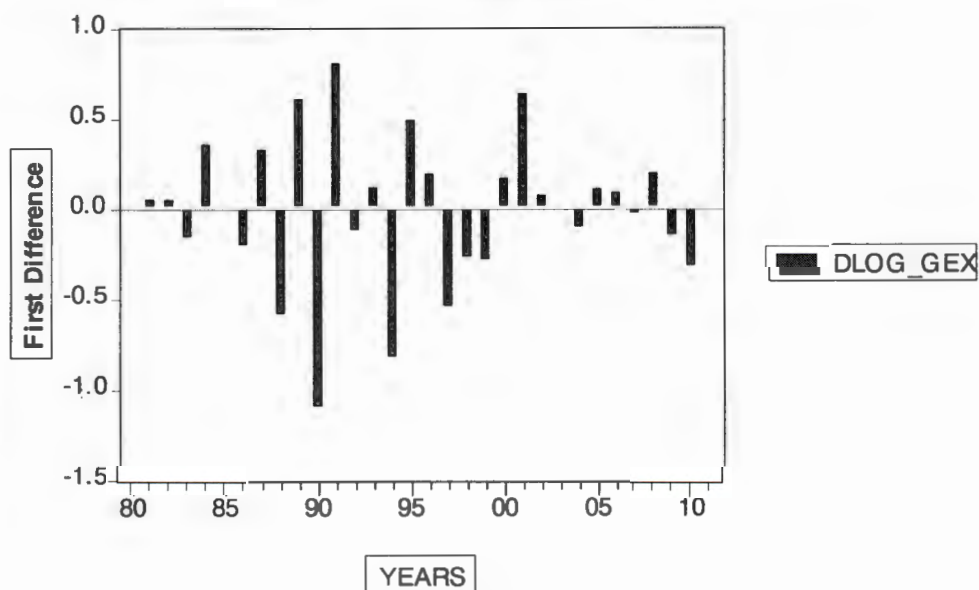
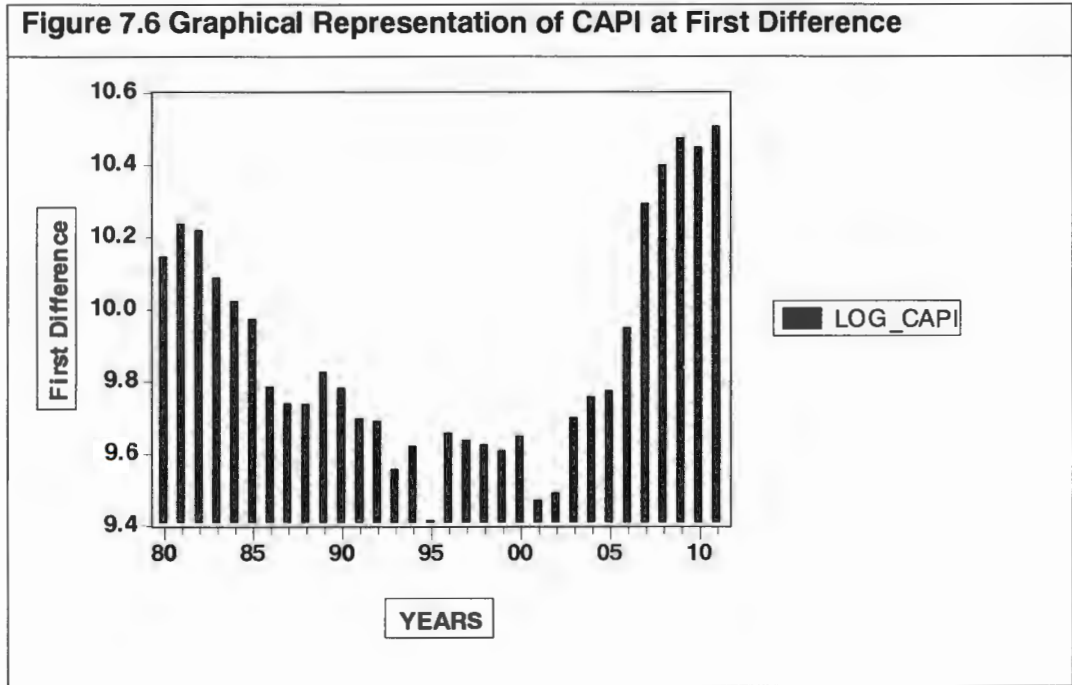
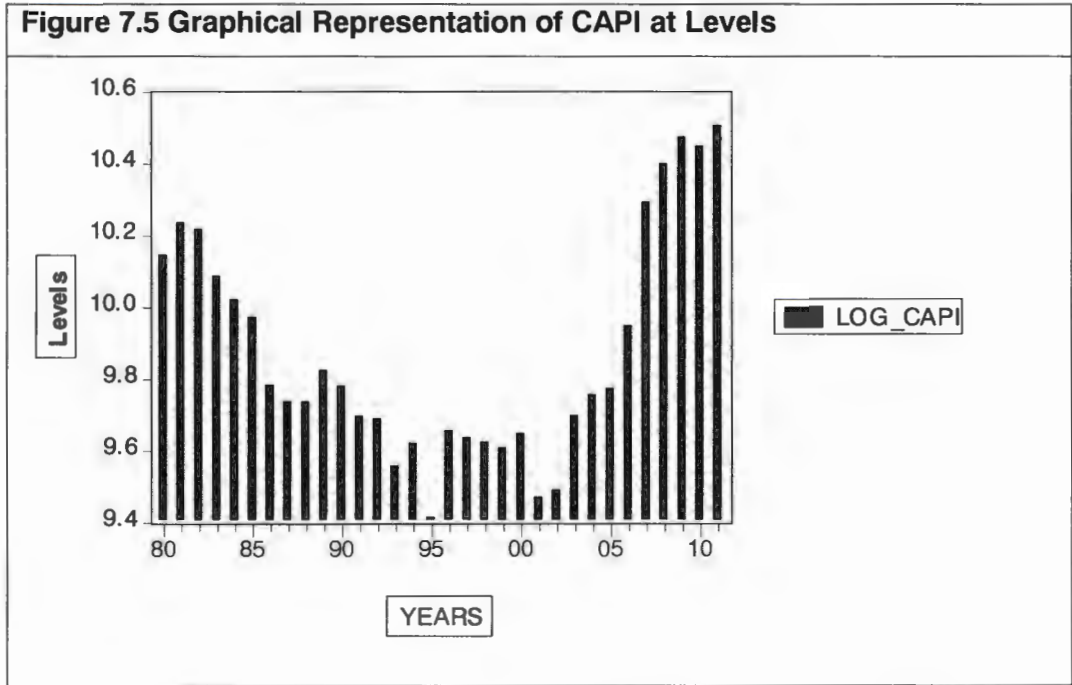


Figure 7.3 is a graphical representation of government expenditure (GEX) at levels. Visual inspection of the variables on the plot indicates that the series is stationary. The series is differenced at the first level and a graphical representation Figure 7.4 produced.



This means that after differencing at the first level, we reject the null hypothesis of non-stationarity. In Figure 7.5, we observe a partially stationary trend exhibited by the series, but after differencing at the first level, we are completely certain that we can reject the null hypothesis for non-stationarity.

In conclusions, all the tables above (Figure 7.1 to 7.6) indicate that one of the variables at levels is trended and in some, the variables show partial stationarity in the series. This is a problem as it might cause spurious results. To this effect, differencing is performed to remedy the problem. As can be observed, the series under study show no signs of trending time series after differencing at the first level. At this point of our analysis, the formal testing procedure utilized for testing for the existence of unit-roots at levels, and then at first difference, is the Augmented Dickey-Fuller and Philips Perron tests. The results of the tests are presented in Tables 7 and 8.

This section of the study is aimed at testing for the order of integration. In other words, each variable is tested for stationarity. The hypothesis that is tested is the null hypothesis, that of the existence of a unit-root (non-stationarity), against the alternative, of stationarity (no unit-root). Below, (in Tables 7 and 8) we present the results of running ADF and PP tests for all the variables at levels and at first difference.

5.4 Unit Root Results

ADF unit root test is performed in order to take out the non-stationarity in the series. In this section, we perform the ADF unit root test at levels and at first difference. Using the lags, we find the significance level at trend, trend and intercept, and none. The (*)-asterix/star signs you see in the test, indicate stationarity. The more they appear, this means the series is getting stationary.

The series usually display or represent data using the real quantities. At levels the graph uses logarithmic values to represent the series. When using logarithmic notation or quantities, we assume that the series is non-stationary at levels, and therefore we need to difference.

Table 7: ADF Unit Root Tests for All Variables at Levels

Series Levels	Model	Lag Length	ADF	ADF
GEX	Intercept	1	-1.9644	-3.6661
	Trend + Intercept	1	-2.3347	-4.2949
	None	0	-0.6220	-2.6395
GDP	Intercept	2	-1.0952	-3.6752
	Trend + Intercept	2	-1.6812	-4.3082
	None	1	1.8724	-2.6423
CAPI	Intercept	2	-1.0952	-3.6752
	Trend + Intercept	3	-0.3150	-4.3226
	None	2	0.2716	-2.6453

*- Statistically significant at 10% level

** - Statistically significant at 5% level

***-Statistically significant at 1% level

We test the following hypothesis:

H_0 : non-stationary

H_1 : stationarity

The results from the test (in Table 7) indicate clearly that the null hypothesis (non-stationarity) cannot be rejected for most of the variables, when the test is run in levels (at trend, at trend and intercept, and none). At this point of our analysis, we employ differencing in order to observe whether the series will exhibit a stationary trend.

As can be seen in Table 8, most of the variables are significant at 1 percent, 5 percent, and 10 percent. We therefore reject the null hypothesis, that of non-stationarity, against the alternative. It is clear from our examination that the variables are stationary, which means that their mean and variance are constant.

Table 8: ADF Unit Root Tests for All Variables at First Difference

Series Levels	Model	Lag Length	ADF	ADF
GEX	Intercept	1	-6.1289***	-3.6852***
	Trend + Intercept	2	-5.7393**	-4.3382**
	None	2	-5.9855***	-2.6522***
GDP	Intercept	1	-4.5123**	-3.6852**
	Trend + Intercept	1	-4.4134**	-4.3226**
	None	2	-4.3459**	-2.6522**
CAPI	Intercept	2	-5.5509***	-3.6959***
	Trend + Intercept	1	-5.8064***	-4.3226***
	None	2	-5.6405***	-2.6522***

*- Statistically significant at 10% level

**- Statistically significant at 5% level

***-Statistically significant at 1% level

Table 8 presents the results of the ADF Unit Root tests which formally confirms the stationarity of the variables under study. This can be observed by the many 'star signs/asterix' assigned to the ADF, which indicate the significance levels. For the purpose of our study, we extend our analysis to also include using the Phillips Perron Test. The results of the Philips Perron test are presented below.

Table 9: PP Unit Root Tests for All Variables at Levels

Series Levels	Model	Lag Length	PP Test-statistic	Critical Values
GEX	Intercept	2	-3.3150*	-3.6576*
	Trend + Intercept	2	-3.9239	-4.2826
	None	2	-0.5789	-2.6395
GDP	Intercept	2	-4.1374**	-3.6576**
	Trend + Intercept	2	-0.8459	-4.2826
	None	2	12.1647	-2.6395
CAPI	Intercept	2	-0.5849	-3.6576
	Trend + Intercept	2	-0.3651	-4.2826
	None	2	0.4425	-2.6395

*- Statistically significant at 10% level
**- Statistically significant at 5% level
***-Statistically significant at 1% level

Just like in the ADF Unit tests, we observe that, when the tests are run at levels, we cannot reject the null hypothesis (non-stationarity). At this point we run the tests at first difference, to observe whether the series will exhibit a stationary trend. The results of the PP Unit Root test for all the variables at first difference are presented in Table 10.

Table 10: PP Unit Root Test for All Variables at First Difference

Series Levels	Model	Lag Length	PP Test-statistic	Critical Value
GEX	Intercept	2	-18.2782***	-3.6752***
	Trend + Intercept	2	-17.9222***	-4.3082***
	None	2	-18.6099***	-2.6453***
GDP	Intercept	1	-7.9366**	-3.6752**
	Trend + Intercept	1	-7.7949**	-4.3082**
	None	1	-8.0668**	-2.6453**
CAPI	Intercept	1	-9.6794***	-3.6752***
	Trend + Intercept	1	-9.4887**	-4.3082**
	None	1	-9.8673***	-2.6453***

*- Statistically significant at 10% level

** - Statistically significant at 5% level

***- Statistically significant at 1% level

Table 10, summarises the results of the PP unit root test. The results of the Philips-Perron unit root test, suggest that the variables are integrated of order one. Evidence indicates that the series under study are stationary in the first difference. Therefore, most of the variables reject the null hypothesis of non-stationarity at a significance level of 1 percent and 5 percent, against the alternative. This implies that there is a possibility of a long run relationship between the variables.

In conclusion, At this point of our study, we are concerned with whether there are any long term/ long run relationship between the variables. The next section answers this question, and determines whether a long run relationship exists between the variables. This is very important, as it one of the study's aims.

5.5 Cointegration Testing

The basic idea of this section follows from our analysis in the previous section. The main point was that trended time series could potentially create a major problem in empirical econometrics because of spurious regression. The study also notes that most macroeconomic variables are trended and therefore, the spurious regression problem is highly likely to be present in many macroeconomic models.

In the previous section we showed that, if two variables are non-stationary we can represent the error as a combination of two cumulated error processes. These cumulated error processes are stochastic trends and we expect them to combine to produce another non-stationary process. For instance, if two variables (*GDP* and *GEX*) are in fact related, we expect them to move together so the two stochastic trends would be very similar. When we put the two variables together, it should be possible to find a combination of them that eliminates the non-stationarity. In this case, we say that the variables are cointegrated. This only happens when there is truly a relationship linking the two variables. That is the reason cointegration is such a powerful way of detecting the presence of economic structures.

If the variables are not cointegrated, we have problems of spurious regression and econometric work becomes meaningless. On the other hand, if the stochastic trends cancel, then we have cointegration.

5.5.1 Engle-Granger Cointegration Results

By definition, cointegration necessitates that the variables be integrated of the same order. Therefore, the first step is to estimate the ECM in order to analyse the long-run and short-run effects of the variables. The study employs a conventional OLS method for cointegration testing. The estimate equation is run at levels in order to obtain the residuals, which are then tested for stationarity. If the coefficient has a negative sign, this means that a negative relationship exists between the variables under investigation. This is demonstrated below in Table 11, where the coefficient has a negative sign.

Table 11: Dependent Variable – LOG_GDP

Method: Least Squares			
Sample: 1980-2011			
Included Observations: 32			
Variable	Coefficient	Std. Error	t-Statistic
LOG_GEX (GEX)	-1.430235	0.484203	-2.953790
C	16.85371	1.272754	13.24192
R-squared = 0.2253			
Adjusted R ² = 0.1994			
S.E of Regression = 1.044233			

We analyzed 32 observations using time series regression for the period between 1980 and 2011 in South Africa. The results indicate that government expenditure has a coefficient of -1.43, which indicates that a negative relationship exists between the two variables. The R^2 is 0.22, and this implies that there is a 22 percent chance that government expenditure will impact negatively on economic growth in the short run.

The study notes that, estimation of variables at levels may lead to spurious results. The estimation enables us to find out if the residuals obtained from the cointegration regression is a white noise. Since we are able to produce residuals from OLS, the next step is to perform unit-root tests on the residuals. We test the null hypothesis (no cointegration relationship), against the alternative (cointegration). See Table 12 below.

Table 12: Unit Root Test on Residuals (*RESID01*)

Variables	Model	ADF Lags	ADF
Res_Coint	Intercept	0	-1.8937
Res_Coint	Trend + Intercept	0	-4.1295**

*- Statistically significant at 10% level

** - Statistically significant at 5% level

***-Statistically significant at 1% level

It is of major importance to note that the critical values for the cointegration test (the ADF test on residuals) are not the same as the standard critical values of the ADF test used for testing stationarity (Asteriou & Hall; 2011). According to the authors, Engle and Granger (1987) performed their own simulations to construct critical values for the cointegration tests. The cointegrating regressions are evaluated using the ADF test and McKinnon (1991) surface response variables to determine the critical values to which we must compare the ADF statistics above. The following is a formula to solve for the critical values:

$$C(p) = \phi_{\infty} + \phi_1 T^{-1} + \phi_2 T^{-2}$$

Where:

C(p) is the p percent critical value

T is the number of observations

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Constant no Trend

$$C(p) = \phi_{\infty} + \phi_1 T^{-1} + \phi_2 T^{-2}$$

$$1\% = -3.9001 - 10.534(1/32) - 30.03(1/1024) = -4.2586$$

$$5\% = -3.3377 - 5.967 (1/32) - 8.98 (1/1024) = -3.5329$$

$$10\% = -3.0462 - 4.069 (1/32) - 5.73 (1/1024) = -3.1789$$

Constant + Trend

$$C(p) = \phi_{\infty} + \phi_1 T^{-1} + \phi_2 T^{-2}$$

$$1\% = -4.3266 - 15.531(1/32) - 34.03(1/1024) = -4.8451$$

$$5\% = -3.7809 - 9.421(1/32) - 15.06(1/1024) = -4.0900$$

$$10\% = -3.4959 - 7.203(1/32) - 4.01(1/1024) = -3.7249$$

Hypothesis testing:

H_0 : no cointegration (residuals are non-stationary)

H_1 : cointegration

Rejection rule: reject H_0 if $ADF < \text{critical value}$

Unit root testing on residuals (RESID01) shows that the ADF for constant + trend are significant at the 5 percent and 10 percent levels. Therefore, we reject H_0 , which means that the residuals are stationary, and therefore there is cointegration.

5.5.2 Johansen Cointegration Results

When you are estimating a model that includes time series variables, the first thing you need to make sure is that all the time series variables in the model are stationary or they are cointegrated. This means that they are integrated of the same order and that the errors are stationary, in which case the model defines a long-run equilibrium relationship among the cointegrated variables. A cointegration test usually takes two steps. The first step is to conduct a unit root on each of the variables to find the order of integration. If all variables are of the same order, the second step is to estimate the model, also called a 'cointegrating equation' and test whether the residual of the model is stationary.

If two times series variables are non-stationary, but cointegrated, at any point in time the two variables may drift apart, but there will always be a tendency for them to retain a reasonable proximity to each other. There may be more than one cointegrating relationship among cointegrated variables.

Table 13: Johansen Cointegration Test (GDP, GEX, and CAPI)

Hypothesised no of CE(s)	Eigenvalue	Likelihood Ratio	1% critical Value	5% critical Value
None	0.908323	97.66320 **	35.65	29.68
At most 1	0.512700	23.58906 **	20.04	15.41
At most 2	0.041190	1.303943	6.65	3.76

***(**)** denotes rejection of the hypothesis at 5% (1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

The study confirms cointegration by employing the Johansen Cointegration technique. Table 13 presents the results of the test. According to the critical values reported by Johansen cointegration, a likelihood ratio, and Eigenvalue test statistics provided significant evidence for the existence of a cointegrating relationship between total government expenditure by national government, gross fixed capital formation, and GDP growth. The cointegration exists with 2 (two) cointegrating vectors.

5.6 Estimation of the Error Correction Model (ECM)

The ECM is important for several reasons; firstly, it is a convenient model measuring the correction from disequilibrium of the first period, which has a very good economic implication. Secondly, if we have cointegration, ECM's are formulated in terms of first differences, which typically eliminate trends from variables, and they resolve the problem of spurious regressions. The third advantage is the ease in which ECM's fit into the general to specific approach to econometric modelling. Lastly, the fact that the two variables are cointegrated implies that there is some adjustment process preventing the errors in the long-run relationship from becoming larger and larger. What is of importance here is that when two variables Y and X are cointegrated, the ECM incorporates not only short-run but also long-run effects. This is because the long-run equilibrium is

included in the model together with the short-run dynamics captured by the differenced term. All the terms in the ECM are stationary, and standard OLS is therefore valid.

Table 14: ECM Results

Dependent Variable: DLOG_GDP				
Method: Least Squares				
Sample: 1982 2011				
Observations: 30				
Variable	Coefficient	Std. Error	t-Statistic	Probability
C	0.057852	0.024000	2.410507	0.0243
DLOG_GEX(-1)	-0.021938	0.012681	-1.729976	0.0970
DLOG_CAPI(-1)	-0.020575	0.035624	-0.577550	0.5692
CAPI(-1)	-5.35E-06	2.37E-06	-2.259635***	0.0336
GDP(-1)	6.92E-08	3.54E-08	1.955773***	0.0627
GEX(-1)	0.007988	0.002539	3.146524**	0.0045
ECM(-1)	-0.048999	0.020851	-2.349985	0.0277
R squared = 0.588114 Adjusted R-squared = 0.480666 S.E of Regression = 0.020352 Akaike = -4.750337 Schwarz = -4.423391 Durbin Watson = 2.281126				

*- Statistically significant at 10% level

**-. Statistically significant at 5% level

***-Statistically significant at 1% level

In Table 14, after regressing equation 5, we observed that the coefficient on total government expenditure, and gross capital formation by government in construction works is negative and statistically insignificant in the short run. According to the results, expenditure by the government on construction works and on other expenditures does not affect GDP in the short-term. The coefficient for government expenditure is insignificant and shows (-0.021), and the coefficient for gross capital formation is also insignificant and has almost the same magnitude (-0.020), as that of government expenditure. This means that in

the short-run, both gross capital formation and government spending, show no evidence indicating any significance of these variables explaining GDP growth. The estimated coefficient on the cointegration regression residual $ECM(-1)$, is negative as it should be.

The results in Table 14 indicate that the coefficient on total expenditure by national government is positive and statistically significant in the long-run, suggesting that increased government expenditures will boost economic growth in the long run. However, it can be observed that gross capital formation affects growth negatively in the long-run. These variables are statistically significant at 1 percent and 5 percent in explaining GDP growth. From a statistical point of view, it appears as though we have a moderately good relationship with approximately 58 percent of the variation in the dependent variable being explained by the regressors.

In summary, there is sufficient evidence to show that in the short-run, both gross capital formation by government, and total expenditure by national government do not influence economic growth. In the long-run, however, we observe that government expenditures has a small positive and significant effect on economic growth.

5.7 Granger Causality Results

Since there is cointegration between government spending and economic growth, we proceed to test for the direction of causality using a simple Granger causality test. One of the good features of VAR models is that they allow us to test for the direction of causality. Granger (1969) developed a simple test that defined causality as follows: a variable y_t is said to Granger cause x_t , if x_t can be predicted with greater accuracy by using past values of the y_t variable rather than not using such past values, provided all things remain constant. The presence of a cointegrating vector allows for the use of a vector error correction model to test causality. The following tables below, represent the results of the Granger causality test.

Table 15.1: Granger Causality (GDP:GEX)

Null Hypothesis	Obs	F-statistic	Prob
DLOG_GDP does not Granger cause DLOG_GEX	29	0.72376	0.49521
DLOG_GEX does not Granger cause DLOG_GDP	29	0.18630	0.83121

Table 15.2: Granger Causality (CAPI:GEX)

Null Hypothesis	Obs	F-statistic	Prob
DLOG_CAPI does not Granger cause DLOG_GEX	29	0.52743	0.59680
DLOG_GEX does not Granger cause DLOG_CAPI	29	1.08347	0.35400

Table 15.3: Granger Causality (GDP:CAPI)

Null Hypothesis	Obs	F-statistic	Prob
DLOG_CAPI does not Granger cause DLOG_GDP	29	0.72376	0.04382**
DLOG_GDP does not Granger cause DLOG_CAPI	29	1.99479	0.15797

The results of the Granger causality test indicate that in almost all the cases from Tables 15.1 to 15.3, most of the reported probabilities are greater than 0.05 significant levels. No evidence is found to suggest that government expenditure Granger causes GDP. There is also no evidence to suggest that gross capital formation Granger causes GDP. In testing for Granger causality, the study employed 2 lags. The hypothesis that GDP does not Granger cause gross capital formation is rejected at 5 percent significance levels. The evidence in this section does not provide much support for the causality relationship between government expenditure and economic growth. There is weak evidence that suggests that causality runs from GDP to government spending. On the other hand, there is sufficient evidence to suggest that gross capital formation by government in construction works granger causes economic growth.

5.8 Diagnostic and Stability Test Results

There are eight critical assumptions related to the classical linear regression model (CLRM). These assumptions are required to show that the estimation technique (OLS), has a number of desirable properties, and also that the hypothesis tests regarding the coefficient estimates could validly be conducted.

Here are some of the assumptions about the ways in which observations are generated, and they include the following. The first assumption is linearity, and it assumes that the dependent variable can be calculated as a linear function of a specific set of independent variables, plus a disturbance term. The second assumption is that X_t is variable, which means that not all observations of X_t are the same, at least one has to be different, so that the sample $Var(X)$ is not 0. Thirdly, we assume that X_t is non-stochastic and fixed in repeated samples. This assumption means that, X_t is a variable whose values are determined by an experimenter or investigator, and that these values are not determined by chance mechanisms. In addition, it is possible to repeat the sample with the same independent variable values.



Fourthly, we assume that the expected value of the disturbance term is zero. This means that the disturbance is a real disturbance, so that if we take a large number of samples, the mean disturbance will be zero. The fifth assumption is Homoskedasticity, which requires that all disturbance terms have the same variance. Serial independence has a special significance in economics in the sense that we nearly always use times series data, in which each t is one year, or one quarter, or one week ahead of the last. The condition means that the disturbance in one period, should not be related to a disturbance in the next or previous periods. Normality of residuals means that the disturbances are assumed to be independently, and identically normally distributed with mean zero and common variance. Multicollinearity assumes that the number of observations must be greater than (2) two, or in general must be greater than the number of independent variables, and that there are exact linear relationships among variables. The results of all the diagnostic tests are presented in Table 16 below. The results of the Ramsey RESET test are presented in Table 17.

Table 16: Diagnostic Tests

Test	H_0	Test Statistics	p-value	Conclusion
Jacque-Bera	Residuals are normally distributed	J.B = 1.618	0.445	Cannot reject H_0 and conclude that the residuals are normally distributed. Therefore accept H_0
Breusch-Godfrey	No serial correlation in the residuals up to the 2 nd order	nR² = 0.148	0.928	Accept H_0 , and conclude that there is no serial correlation up to the 2 nd order
ARCH LM	No autoregressive conditional heteroskedasticity up to the 1 st order	nR² = 0.042	0.836	Accept H_0 and conclude that there is no autoregressive conditional heteroskedasticity
White	No heteroskedasticity	nR² = 8.868	0.714	Accept H_0 and conclude that the model is stable

Table 17: Stability Test

Ramsey Reset	Model is unstable with no error specification	LR = 18.095	0.000021	Can not reject H_0
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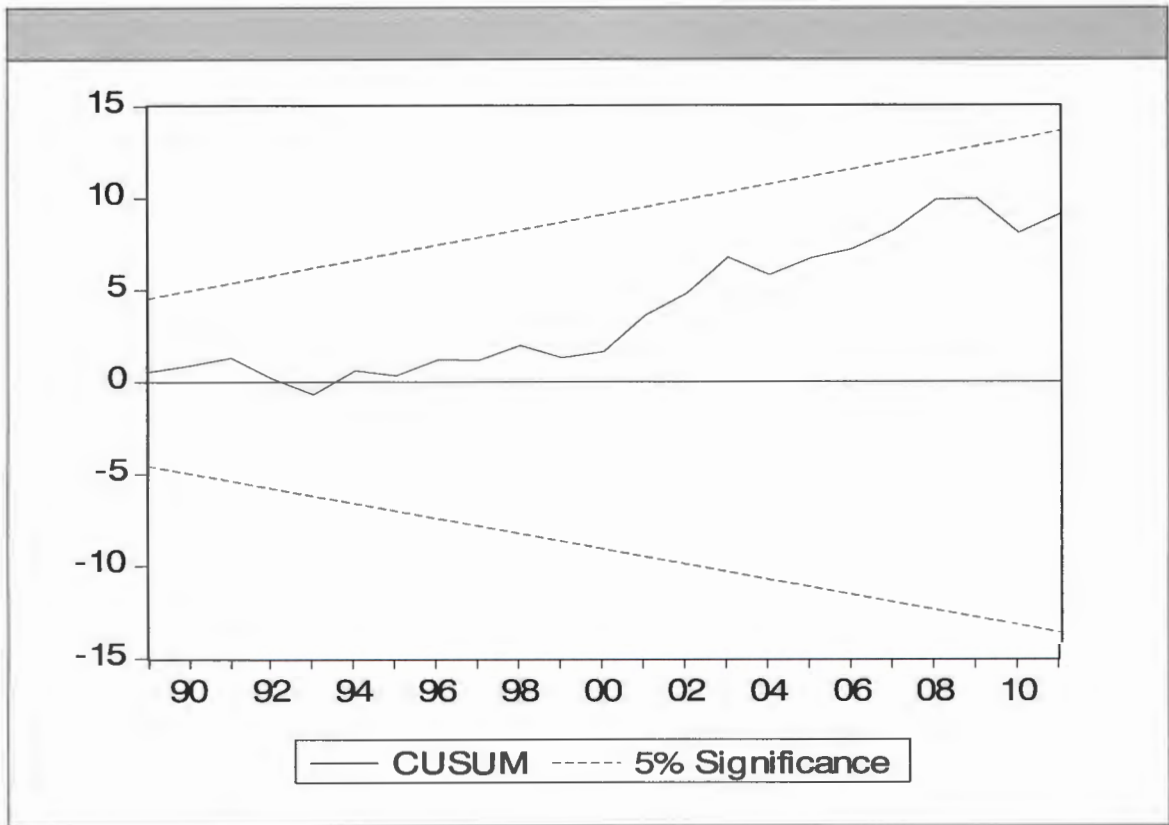
Rejection rule : H_0 : if $p < 0.05$

The results of the diagnostic tests above show a Jacque-Bera value of 1.618 with a corresponding p-value of 0.445 confirming that the residuals are normally distributed. The Breusch-Godfrey test results indicate that there is no serial correlation in the residuals up to the 2nd order. The results conclude that there is no autoregressive conditional heteroskedasticity, and therefore accepts the null

hypothesis. The test shows that our model is stable and conforms to CLRM assumptions.

This CUSUM test determines how well the model used to measure the impact between economic growth and government expenditure. The Cusum test below (see Table 18) indicates that the model is good for determining the relationship between inflation and growth, since the line is inside the range (bands).

Table 18: Cusum Test Results



5.9 Summary of Results

The study examined annual time series data in South Africa for the fiscal-policy-growth nexus from 1980 to 2011. Various econometric testing procedures are used for this study. The study notes that time series data can produce spurious results if the variables are non-stationary. In the first test, we employed visual inspection as well as Unit root tests to determine if the variables under study are

stationary. The Augmented Dickey-Fuller and the Phillips-Perron unit root testing techniques are employed to test for stationarity. The results of unit root testing reject the null hypothesis of non-stationarity, and confirm that the variables are stationary after differencing at the first level and integrated of the first order.

The second test we performed was the cointegration test, to test for the existence of cointegrating (the long-run equilibrium) relationships. The study employed Engle-Granger as well Johansen cointegration techniques to determine if the variables are closely cointegrated in the long run. The results of the Engle-Granger test indicate that there is a negative relationship between economic growth and government expenditure in the short run. Unit root testing on residuals (*RESID01*) shows that the ADF for constant + trend are significant at the 5 percent and 10 percent levels. Hence, we reject H_0 , which means that the residuals are stationary, and as a result, there is cointegration. The study confirms cointegration by also employing the Johansen Cointegration technique. According to the critical values reported by Johansen cointegration, the results provide significant evidence for the existence of a cointegrating relationship between total government expenditure by national government, gross fixed capital formation, and GDP growth. The cointegration exists with two cointegrating vectors. Thus, we reject the null hypothesis.

The results of estimating the ECM, reveal sufficient evidence to explain that in the short-run, both gross capital formation by government, and total expenditure by national government do not influence economic growth. Whereas, in the long-run, we observe that government expenditures has a small positive and significant effect on economic growth. This result is extremely important for our analysis. The results show that a negative relationship exists between public expenditure and economic growth in the short-run. The results also indicate that the coefficient on total expenditure by national government is positive and statistically significant in the long-run, suggesting that increased government expenditures will boost economic growth in the long run.

Granger causality tests do not shed light on the direction of causality between public expenditure and economic growth. This result is very important, as other

studies have found contrasting results. There is weak evidence to suggest causality in any direction. However, there is sufficient evidence to suggest that gross capital formation by government in construction works granger causes economic growth. This means that investment in construction works by national government causes economic growth.

The results of the diagnostic and stability checks provide us with important information related to the stability of our model. In general the tests confirm that the model used in the study is good, and this can be presented in Tables 16-18.

Chapter 6

6. Conclusions and Recommendation

6.1 Introduction

This chapter is divided into five sections. The first section introduces the chapter, while the second section addresses the conclusions of the study in full. The third section gives us policy implications. The study empirically observes the relationship between government spending and economic growth. The study also determines how government spending influences economic growth in South Africa for the period between 1980 and 2010. The aim of this undertaking is to determine if an increase in government expenditure leads to an increase in economic growth. Another aim is to determine if a causal relationship exists between the economic growth and government spending.

6.2 Summary

This study examined the causal relationship between government expenditure and economic growth in South Africa during 1980 and 2011. The study outlines the evolution of both government spending and economic growth. To this end, the analysis employed a simple model to study the role played by Government spending on economic growth. Literature in general has observed contrasting results in the treatment of the fiscal-policy-growth hypothesis. Adolf Wagner postulated that government spending is an endogenous variable, and grows faster than income growth. Wagner's Law viewed that government spending plays no role in generating economic growth, hence the causality direction runs from economic growth to government spending. On the other hand, John Maynard Keynes (1936) argued that government spending is an exogenous variable and used to generate economic growth. For this reason, government spending is a cause rather than effect of economic growth. Therefore, the causal relationship should run from government spending to economic growth. The results of our study provide insight into the relationship in a South African context.

The findings of this examination are very important to South Africa, and have policy implications for the short run, and the long run. We treat the conclusions and the, policy implications and recommendations in the following sections.

6.3 Conclusions

This study has achieved the main aims and objective as set out in Chapter 1. After analysing South African data, the study formally accepts the research hypothesis that an increase in government expenditure has led to an increase in economic growth. This hypothesis is supported by the empirical results in Chapter 5. The results of the ADF Unit Root tests formally validate the stationarity of the variables under study. The results of the Philips-Perron unit root test, suggest that the variables are integrated of order one. Evidence indicates that the series under study are stationary in the first difference. Therefore, most of the variables reject the null hypothesis of non-stationarity at a significance level of 1 percent and 5 percent, against the alternative. This implies that there is a possibility of a long run relationship between the variables.

After employing Cointegration testing methods, the Engle-Granger test results indicate that a negative relationship exists between economic growth and public spending in the short term. Unit root testing on residuals (RESID01) shows that the ADF for constant + trend are significant at the 5 percent and 10 percent levels. The study confirms cointegration by employing the Johansen Cointegration technique. The results provided significant evidence for the existence of a cointegrating relationship between total government expenditure by national government, gross fixed capital formation, and GDP growth. The cointegration exists with 2 (two) cointegrating vectors

After regressing, we observed that the coefficient on total government expenditure, and gross capital formation by government in construction works is negative and statistically insignificant in the short run. The coefficient for government expenditure is insignificant and shows (-0.021), and the coefficient for gross capital formation is also insignificant and has almost the same magnitude (-0.020), as that of government expenditure.

The results indicate that the coefficient on total expenditure by national government is positive and statistically significant in the long-run, suggesting that increased government expenditures will boost economic growth in the long run. However, it can be observed that gross capital formation affects growth negatively in the long-run. These variables are statistically significant at 1 percent and 5 percent in explaining GDP growth. Lastly, no evidence is there to suggest that government expenditure Granger causes GDP, and there is no evidence to suggest that gross capital formation Granger causes GDP. The results of the causality tests offer, little to no support for Wagner's Law, although a small positive increase is achieved.

6.4 Policy Implications

Here are some of the policy implications that the undertaking have picked up:

- There is sufficient evidence to suggest that increased government expenditures will boost economic growth in the long-run.
- There is sufficient evidence to suggest that gross capital formation by government in construction works granger causes economic growth.
- According to the results, expenditure by the government on construction works and on other expenditures does not affect GDP in the short-term.

6.5 Recommendations

Having noted the policy implications above, we proceed to provide decision makers with some recommendations. The study notes that a positive long-term relationship exists between government expenditure and economic growth. The study notes that this result suggests that increased government will boost economic growth. If economic growth increases, it follows that per capita GDP will also increase. With an increase in per capita GDP, real incomes will rise, and because of increased real incomes, disposable incomes will increase. This will create an enabling environment, that lead to a rise in living standards. This

will increase individual wellbeing and benefit to all participants in the economy. This research has achieved its empirical aims and objectives by proving that a long-term relationship exists between public sector expenditure, and economic growth in the Republic of South Africa.

The study also notes that there is sufficient evidence to suggest that public sector investment in construction works granger causes economic growth. Infrastructure investments have been proposed in the development literature as an influential factor of economic growth, working through at least two of the three classic drivers of economic growth: i.e. directly via capital accumulation and indirectly via total factor productivity gains (Fedderke et al; 2006). According to the authors, infrastructure investments are hypothesized to facilitate private investments by lowering production costs and opening new markets, thereby creating new production, trade and profit opportunities. Roads reduce transport costs and ports reduce transaction and trade costs. Both can be deemed to expose local firms to the innovative pressures of international competition (Fedderke et al; 2006)

In conclusion, the findings are consistent with current research literature. The results show that the South African government needs to spend more money on infrastructure programmes, which are mostly aimed job creation, since they are more inclined to make the economy grow. Research in infrastructure led economic growth have consistently shown that a positive and significant relationship between the variables. According to the results of the analysis, initiatives aimed at growing the economy through infrastructure projects are essential both in the short-run, because the impact on growth is minimal, as well as in the long-run, where its impact is greater. This means that the South African government is justified in the prioritisation of infrastructure development programs. Research on productive government expenditure will enhance the current literature in the area of public finance.

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APPENDIX 1: Data for GDP and Total Government Expenditure (1980-2011)

Code	Unit Of Measure	Description
KBP6006J	R millions	Gross domestic product at market prices (GDP)
KBP4601Y	Percentage	National government: Total expenditure
View all on single Graph		

Date	KBP4601Y National government: Total exp ...	KBP6006J Gross domestic product at mark ...
1980	16.4	62730
1981	17.4	72654
1982	18.4	82462
1983	15.5	94350
1984	22.3	110584
1985	22	127598
1986	17.7	149395
1987	24.7	174647
1988	13.6	209613
1989	25.1	251676
1990	8.3	289816
1991	18.7	331980
1992	16.4	372225
1993	18.6	426133
1994	8.1	482120
1995	13.3	548100
1996	16.2	617954
1997	9.3	685730
1998	7	742424
1999	5.2	813683
2000	6.2	922148
2001	11.8	1020007
2002	12.8	1171086
2003	12.8	1272537
2004	11.4	1415273
2005	12.8	1571082
2006	14.1	1767422
2007	13.6	2016185
2008	16.7	2262502
2009	14.2	2398155
2010	10.2	2661434
2011	10.3	2964261

Appendix 2: Data for Gross Fixed Capital Formation (1980-2011)

Code	Unit Of Measure	Description
<u>KBP6119Y</u>	R millions	Gross fixed capital formation: Construction works - General government (Investment)

[View all on single Graph](#)

Date	KBP6119Y Gross fixed capital formation: ...
1980	25533
1981	27972
1982	27464
1983	24088
1984	22547
1985	21471
1986	17806
1987	16992
1988	16982
1989	18526
1990	17739
1991	16301
1992	16186
1993	14183
1994	15100
1995	12298
1996	15656
1997	15348
1998	15150
1999	14924
2000	15527
2001	12988
2002	13271
2003	16331
2004	17313
2005	17595
2006	20955
2007	29593
2008	32922
2009	35445
2010	34556
2011	36633

APPENDIX 3: ECM

ECM: Error Correction Model Output

Dependent Variable: DLOG_GDP Method: Least Squares Date: 08/06/12 Time: 15:44 Sample(adjusted): 1982 2011 Included observations: 30 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG_GEX(-1)	-0.021938	0.012681	-1.729976	0.0970
DLOG_CAPI(-1)	-0.020575	0.035624	-0.577550	0.5692
CAPI(-1)	-5.36E-06	2.37E-06	-2.259635	0.0336
ECM(-1)	-0.048999	0.020851	-2.349985	0.0277
GDP(-1)	6.92E-08	3.54E-08	1.955773	0.0627
GEX(-1)	0.007988	0.002539	3.146524	0.0045
C	0.057852	0.024000	2.410507	0.0243
R-squared	0.588114	Mean dependent var		0.123622
Adjusted R-squared	0.480666	S.D. dependent var		0.028241
S.E. of regression	0.020352	Akaike info criterion		-4.750337
Sum squared resid	0.009526	Schwarz criterion		-4.423391
Log likelihood	78.25505	F-statistic		5.473460
Durbin-Watson stat	2.281126	Prob(F-statistic)		0.001212

Appendix 4: Granger Causality Output

Pairwise Granger Causality Tests Date: 08/06/12 Time: 16:30 Sample: 1980 2011 Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
DLOG_GDP does not Granger Cause DLOG_GEX	29	0.72376	0.49521
DLOG_GEX does not Granger Cause DLOG_GDP		0.18630	0.83121
DLOG_CAPI does not Granger Cause DLOG_GEX	29	0.52743	0.59680
DLOG_GEX does not Granger Cause DLOG_CAPI		1.08347	0.35440
DLOG_CAPI does not Granger Cause DLOG_GDP	29	3.57303	0.04382
DLOG_GDP does not Granger Cause DLOG_CAPI		1.99479	0.15797

Appendix 5: Diagnostic and Stability Test Output

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.052069	Probability	0.949386
Obs*R-squared	0.148033	Probability	0.928656

ARCH Test:			
F-statistic	0.039605	Probability	0.843746
Obs*R-squared	0.042477	Probability	0.836714

White Heteroskedasticity Test:			
F-statistic	0.594546	Probability	0.818206
Obs*R-squared	8.868475	Probability	0.714121

Ramsey RESET Test:			
F-statistic	18.21435	Probability	0.000314
Log likelihood ratio	18.09544	Probability	0.000021

Appendix 6: Histogram

