AN EMPIRICAL ANALYSIS OF THE IMPACT OF EXTERNAL DEBT AND GOVERNMENT DEBT ON ECONOMIC GROWTH IN SOUTH AFRICA: 1970-2015

BY

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Dissertation submitted in partial fulfillment of the requirements for the award of the degree of MCom in Economics in the Faculty of Commerce and Administration at the (MAFIKENG CAMPUS) of the North West University.

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DECLARATION

I declare that this dissertation is the original work, submitted for a degree of M Com in Economics in the Faculty of Economic Sciences at the North-West University, Mafikeng Campus except where otherwise indicated and acknowledged. This is an unassisted work that has never been submitted at any university or presented at any institution

LERATO TLHARIPE-MOTHIBI

Mothibi
22/09/17

DEDICATION

This study is dedicated to Tshiamo Morule. Let this study pave your way and become motivation. You can do anything that you set your mind to.

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First and foremost, I would like to express my gratitude to the Lord Almighty for bringing me this far. It is through the strength and wisdom that God gave me, that I was able to reach unimaginable heights.

My sincere gratitude goes to my mother Mankuku, for raising such a driven, loving and passionate woman. I am the woman I am today because of your love. My appreciation goes to my grandparents, Bessie and Joshua; thanking you for teaching and showing me unconditional love. My uncles, Tshepo and Larlly, I am truly grateful for your support. My aunts, Mcqueen and Mpho, thank you for always being there for me. My brother, Boitshepo, my niece and nephew, Tshiamelo and Tshiamiso, thank you for giving me a reason not to fail. It is because of you that failure is not an option to me. I strive to succeed every time in an effort to show you that you can do and be anything you want in life.

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EDITING LETTER

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To whom it may concern

This is to confirm that I, the undersigned, have language edited the **dissertation** of

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for the degree

Magister Commercii in the Faculty of Economic Sciences

entitled:

AN EMPIRICAL ANALYSIS OF THE IMPACT OF EXTERNAL DEBT AND

The responsibility of implementing the recommended language changes rests with the author of the dissertation.

Yours truly,

Linda Scott

ABSTRACT

The management of debt has always been a major concern for many developing countries in the world, including South Africa. Debt is amongst the main macro-economic indicators that provide an image of the country in international markets. This study analyses the relationship between government and external debt on economic growth in South Africa from 1970 to 2015. The study's macro-economic background is examined by reviewing the trends of debt and growth in South Africa. The study reviews the literature on debt and economic growth, where an empirical model linking the theoretical and empirical literature is estimated, making use of the ARDL cointegration method.

The variables specified in the methodology include gross domestic product (GDP), foreign debt (FD), total loan debt of national government (GD), gross national expenditure (EXP), and gross fixed capital formation (INV). The results obtained by the study indicate that FD and INV have a negative impact on growth, while GD and EXP have a positive impact on economic growth in South Africa. In order to confirm that the model is in accordance with the classical linear regression assumptions, diagnostic and stability tests were conducted. The ARDL test revealed that there is a cointegration relationship between government debt, external debt and economic growth in South Africa. Therefore, it is evident that sound government debt management leads to economic growth and prosperity.

Keywords: South Africa, government debt, external debt, economic growth

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LIST OF ABBREVIATIONS/ACRONYMS

ADF	Augmented- Dickey Fuller
AIC	Akaike information criteria
ANC	African National Congress
ARDL	Autoregressive distributive lag
ASGISA	Accelerated and Shared Growth Initiative for South Africa
BLUE	Best linear unbiased estimator
BOP	Balance of payment
CLRM	Classical linear regression model
CUSUM	Cumulative sums
COSADTU	Congress of South African Trade Union
ECM	Error correction model
EPWP	Extended Public Works Programme
EXP	Expenditure
FD	Foreign debt
FDI	Foreign direct investment
GDP	Gross domestic product
GD	Government debt
GEAR	Growth employment and redistribution
HIPC	Heavily indebted poor countries
ICT	Information and communication technology
INV	Investment
JIPSA	Joint Initiative for Priority Skills Acquisition
NDP	National Development Plan
OLS	Ordinary least squares
PP	Phillips- Peron
RDP	Reconstructive and development plan
RESET	Regression specification error test
SA	South Africa
SACP	South Africa Communist Party
SSA	Sub-Saharan Africa

SARB	South African Reserve Bank
SIC	Schwartz information criteria
SMME	Small, medium and micro-sized enterprises

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Reported to be the highest since the 1980s, South Africa's foreign debt reached a high of 38.2 percent as a percentage of gross domestic product (GDP) at the end of September 2013 (SARB, 2014). External borrowing in itself ought not to be an issue at economically sustainable levels. However, it is rather unfortunate that most sub-Saharan African (SSA) nations accumulated a high, unsustainable level of debt stocks during the mid-70s, which may have constrained the progression of economic growth and development in South Africa. Debt is not only plaguing South Africa, but also remains a challenge for most SSA countries. According to the studies of Audu (2004) and Mutasa (2003), it is perceived in the international community that excessive foreign indebtedness in most developing nations, like South Africa, is a significant obstruction to the country's financial development and strength.

Developing nations, like South Africa, regularly contract enormous measures of debt, which has prompted trade debt arrears at high financing costs. Moreover, accumulated debt service payments bring about a number of problems because debt is financed for more than the sum it was obtained, which slows down the development and growth process of the country (Gohar & Butt, 2012). The evaluation of South Africa's credit rating plays a tremendous role in the debt of the country, as the credit rating provides somewhat of an estimate of the ability of the debtor (South Africa) to fulfil its debt obligations. Credit ratings also provide investors with insight to the risk associated concerning the creditworthiness of the country in which they wish to invest.

As indicated by the Medium Term Budget Policy Statement (2015), the fundamental dangers to the government's borrowing are said to be the credit rating of South Africa, global instability in capital flows and a higher borrowing requirement. Moreover, in December 2015, financial service company Standard and Poor changed the standpoint of South Africa's credit rating from stable to negative, while keeping it at BBB- implying that the debtor has adequate ability to meet its financial duties. However, unfriendly economic conditions or changing conditions will probably prompt a debilitated ability of the debtor to meet its financial duties. Furthermore, Fitch, another financial service company, downsized the sovereign ratings by one notch to BBB-, an indistinguishable level from Standard and Poor; however, with a steady outlook.

Nevertheless, in 2016 Fitch took a decision not to downgrade South Africa. This was on the basis that the nation's sovereign credit assessment was one notch above junk status, which indicated a negative outlook. Moreover, according to Kumo *et al.* (2016), the two credit rating companies, Standard and Poor and Fitch both referred to weak economic growth, political instability, delays in the completion of new electricity plants, higher debt stocks, higher fiscal and current account shortfalls and a weaker currency as the primary risk components.

A credit downgrade for South Africa to junk could see foreign direct investment (FDI) in the debilitated economy slide further as investors escape to different markets looking for higher returns. Given the extraordinary increase of debt accumulation in South Africa, this dissertation seeks to investigate the complex findings of other researchers on the relationship between debt and economic growth in South Africa. Furthermore, the study aims to undertake and examine the trends of debt and economic growth, its causes and possible solutions to policy makers on how to deal with the debt problem. Low levels of debt have positive impacts on growth; however, above specific points or limits accumulated, debt starts to affect economic growth negatively (Pattilo, Poirson & Ricci, 2002). Moreover, the study of Fosu (1996) asserts that high debt service payments shift spending from health, social and educational sectors. This clouds the intention of acquiring financial assistance to improve development and growth of a nation instead of suffocating in a pool of debt service payments, which depletes eats up the country's available assets and impacts on growth due to the high interest payments on external debt.

In most developing countries, the additional amount of debt financing made available is mostly to pay past debt and financing deficiencies. According to a study by Ayadi and Ayadi (2008), the key source of financial capital formation is external debt; therefore, the accumulation of debt remains a fundamental issue to developing countries. Furthermore, in spite of the fact that debt is useful in expanding economic development and growth, it is important that debt reliance is observed and monitored carefully; hence, an appropriate system is required to improve the re-payment ability of that particular economy. Expansive debt accumulation of developing nations acts as an impediment to the process of development and growth, since the advantages received from growth and development are subjected to large debt prerequisites, in addition to creating a disincentive impact for any form of investment, especially private investment.

The assets and resources borrowed from foreign creditors are referred to as external debt. The debtors/borrowers can be enterprises, individuals/private households or the central or state government. A creditor of external debt could be the international monetary fund (IMF), the government or the World Bank. In simple terms, external debt is debt owed to foreigners and is repayable in a currency of another country, which is a foreign currency as indicated by the World Bank definition. Furthermore, according to a study by Makau (2008), government debt, also known as public debt, is referred to as the aggregate debt of a country that covers obligation of state and domestic national governments, which demonstrates the amount of public spending financed by acquiring financial assistance rather than making use of taxation.

A study by Kozali (2007) asserts that as indicated by the absorption limit of economies, nations can acquire foreign assistance as long as their level of real productivity increases. A study by Presbitero (2005) confirms that, when a country potentially surpasses the debt limit, and has high levels of poverty and debt overhang it will be classified as a heavily indebted poor country (HIPC) as that nation will be eligible for special assistance form the South African Reserve bank and for this situation, three problems arise. First, the debt overhang issue, as expressed by the studies of Krugman (1988a) and Sachs (1989), where debt overhang is described as a situation where the economic and financial execution of a country is harmed by relatively high ratios of debts. Secondly, the crowding out impact, where studies such as that of Krugman (1988) express that debt flow can demolish the economic performance of a nation in such a way that abnormal debt ratios can crowd out growth because of net resource outflow and threaten investor confidence. Lastly, the problem of uncertainty, in the sense that an abnormal state of debt ratios, demonstrates danger and risks associated with the debtor nation and, therefore, discourages domestic and foreign investors.

It has been just over 20 years since the first democratic elections were held in South Africa. In 1994, the South African nation witnessed the end of the apartheid system. The new era provided citizens with political freedom, which was seen as the establishment for monetary flourishing and inclusion (Bhorat *et al.*, 2013). Even so, the last two decades have seen blended outcomes. According to Bhorat *et al.* (2013), South Africa's economic growth can be described as volatile and unpredictable, while imbalances in public services have lessened, wage disparity has expanded and destitution levels have remained stagnant. All through this period, there have been phenomenal level headed discussions with respect to economic strategy with the presence of projects such as reconstructive and development plan (RDP), growth employment and

redistribution (GEAR) and recently the national development plan (NDP) (Hanival & Maia, 2008).

The 2016 budget review asserts that the South African economic outlook has crumbled due to lower commodity costs, higher costs associated with borrowing and reduced investor confidence. In 2016, the South African economy shrunk by 0.3 percent, which demonstrated to be a slowdown as compared to the 1.3 percent growth seen in 2015 (StatsSA, 2016). The annual GDP growth in South Africa as asserted by StatsSA (2016) averaged 2.89 percent from 1994 up until 2016. During the final quarter of 2006, GDP was recorded at 7.10 percent, however, in the second quarter of 2009 a record low of -2.60 percent was recorded (StatsSA, 2016). Between 2014 and 2015, GDP declined by 0.2 percent from 1.5 percent to 1.3 percent, where power deficiencies, low commodity costs, low business and consumer confidence continued to restrain the development of economic activity StatsSA (2016).

The government's drive to support social progress and build a more focused economy through the rapid implementation of the NDP is anticipated to yield GDP growth of 2.6 percent in 2017 and 2.8 percent in 2018. According to the Minister of Finance, Pravin Gordhan, "economic growth is slow, unemployment is far too high and many businesses and families are under stress" (Gordhan, 2017), resulting in the current economic conditions in South Africa. According to the World Bank (2016), if South African firms could reposition themselves to exploit the expanded Chinese demand for household products and services, an expected R203 billion could be added to South Africa's GDP by the year 2030.

Furthermore, external debt in South Africa has been relatively high and has kept on increasing in an upward predictable pattern as asserted by Ayadi and Ayadi (2008), therefore, applying considerable negative effects on profitability, growth and development. Moreover, the current account balances, as a portion of the GDP, is expanding typically and external debt is growing. By the year 2007, external debt was already up to US$68 billion as compared to the year 2003 where debt was at US$38.1 billion, indicating a 78 percent increase (Ayadi & Ayadi, 2008). Furthermore, the World Bank (2013) asserts that external debt, by the end of the year 2012, went up to US$137.5 billion, which accounted for 94 percent of the GDP. Despite the significance of money-related approaches, according to a study by Chipaumire *et al.* (2014), the government's fiscal policy has turned into a solid and crucial instrument for growth and development in a country.

According to a study by Pianizza (2008), customarily, developing nations such as South Africa depend on local debt in the case where there is no access to acquiring external resources. This does not imply that domestic government debt is insignificant. Domestic debt, otherwise known as public debt, can have serious ramifications for the economy if the debt is not managed effectively and efficiently in relation to the levels of expected growth. According to a study by Charan (1999), in a case where there is inefficient development in domestic markets, international resources can contribute to the greater part of financing the asset gap. Public debt servicing ingests a noteworthy piece of government incomes, which would have been utilised as a part of development ventures to enhance economic development and growth, consequently implying that the government has fewer assets to spend on development ventures.

The current value of national debt in South Africa, according to the National Debt Clocks (2016), reached an enormous value of R2.1 trillion, which accounts for 40.27 percent of GDP. According to the publication, South Africa faces an interest rate of approximately R120.9 trillion on debt annually, which accounts for R3.80 interest per second, with a population of approximately 54.5 million people. This indicates, according to Ayadi and Ayadi (2008), that the external debt burden imposes a drastic limitation to developing countries with respect to their participation in the global economy. They further indicate that the attendant debt-servicing obligation keeps on manifesting as an obstacle to economic development and growth, which further prompts a restricted accumulation of capital and a restricted use of adaptable financing strategies to consolidate small- and medium-sized firms. This influences employment, literacy and levels of destitution (Ayadi & Ayadi, 2008).

The factors identified by this study clearly illustrate that the government needs to give more attention to the degree and manner of raising government and foreign debt in such a manner that leads to the development and improvement of the South African economy. The interest payable on government debt is, as of now, a noteworthy component in the annual government expenditure, which is evaluated at R100-billion for 2014/2015, or near 10 percent of government expenditure. However, this is in a domain of outstandingly low interest rates, as the South African Reserve Bank has embraced a low-rates arrangement because of the moderate economic development and recuperation from the financial crises in significant economies.

1.2 PROBLEM STATEMENT

According to the budget speech of 2015, the Minister of Finance, Nhlanhla Nene, asserted that, it is due to the depreciation of the exchange rate, a rise in inflation and interest rates and this has resulted in higher debt of R1.804 trillion in 2016 as compared to the projected R1.781 trillion in the 2015 budget. It has been a couple of years since the worldwide economic and financial crisis of 2008, which led South Africa to negative growth rates. However, the financial crisis prompted a prolonged and unexpected financial deterioration that has left the country with real difficulties (Chitiga *et al.*, 2015). The stature of the financial crisis is currently well past, yet its outcomes remain unavoidable, with South Africa still far from a path of re-establishing solid and sustainable economic growth rates, as required by the NDP. Even though the recession was short lived, it left behind noteworthy impacts within the different sectors in South Africa (Bhorat *et al.*, 2013).

According to Kumo *et al.* (2016), the year 2015 indicated that economic performance in South Africa remains challenging, where GDP growth was recorded to be at 1.3 percent. This slow growth essentially was led by discouraged commodity demand from China, low global commodity cost, reduction in investments, inconsistent capital flows and low business and consumer confidence. Moreover, Kumo *et al.* (2016), forecast real GDP to proceed with its descending pattern in 2016, with an expected rate of only 0.7 percent. Tenacious deficiencies in electricity supply in South Africa impose an impact on the South African economy, while the most noticeably unpleasant dry season in two decades continues to devastate agricultural growth, where the sectoral real GDP came down by 16.2 percent (Kumo *et al.*, 2016).

At the end of the fiscal year 2013/14, South Africa's government debt was at R1.44 trillion, which was lower than the government debt levels at the end of the fiscal year 2014/15, which was recorded to be at R1.623 trillion (South African Economic Outlook, 2016). Nevertheless, foreign debt also expanded to R 167 billion from R 144 billion in a similar time period. The expansion in foreign debt partly was due to the frail South African Rand exchange rate. Moreover, the aggregate loan debt of the national government, with respect to both domestic and foreign debt rose from R 1.585 trillion to R 1.799 trillion between March 2014 and March 2015 expanding from 43.9 percent to 46.8 percent of GDP as indicated by SARB (2016).

Due to the quick deterioration of the rand, the rand equivalent of foreign debt expanded from R1.68 trillion toward the end of December 2014 to R1.76 trillion toward the end of March 2015

(Kumo *et al.*, 2016).These attributes demonstrate a need to give watchful thought to the degree and ways of raising new debt in South Africa. This study will focus on the issues identified above in order to determine the short and long run relationship between foreign government and economic growth in South Africa by expanding the scope of the study in such a way that is beyond what has been done previously.

1.3 OBJECTIVES OF THE STUDY

The main objective of this study is to investigate and examine the impact of government and foreign debt on economic growth in South Africa. The sub objectives are as follows:

- To examine the trends of government debt, foreign debt and economic growth in South Africa
- To employ the ARDL approach to measure the significance and magnitude of the causal effect of government debt and foreign debt on economic growth in South Africa
- To review extensively and critically both theoretical and empirical literature of debt and economic growth in both developing and developed economies
- To formulate possible policy measures and suggestions in relation to the findings of this study.

With the above-mentioned objectives, a guideline will be provided about obtaining the necessary information and gaining an insight into the kind of relationship that exists between debt and economic growth. These objectives will also help in providing suggestions and even solutions to policy makers to develop the South African economy.

1.4 HYPOTHESIS OF THE STUDY

The following hypothesis is investigated by this study in order to reach the objectives of the study:

Ho: Government and external debt have no significant impact on economic growth in South Africa.

H1: Government and external debt have a significant impact on economic growth in South Africa.

1.5 SIGNIFICANCE OF THE STUDY

As asserted by Winfred (2014), the burden of debt is a matter of serious concern throughout many SSA countries such as Nigeria and South Africa. Numerous studies have investigated the impact of debt in SSA countries; however, very few studies have addressed the distinction between the relationship between government and foreign debt and economic growth. The study contributes towards the ongoing debates on whether debt is beneficial or hampers the economy, as the literature reveals mixed findings. The study seeks to establish to what extent foreign and government debt impact economic growth in South Africa with respect to the short and long run period. This study will also provide South African policy makers with insight into the factors contributing to debt and growth. In this way, the government can then redirect its resources to where they are needed the most and where they will be beneficial for South African citizens in a manner that will lead to improved debt status and improved economic conditions.

The results obtained by this study will also provide policy makers at all government levels, commercial organisations, investors and ordinary citizens of South Africa with a piece of research that could lead to a better understanding of the implications of debt on the society, individuals, businesses and most importantly on the country as a whole. Moreover, the study will also provide insight with regards to the fact that debt is continuing to grow in an upward direction, as asserted by Ayadi and Ayadi (2008), its causes and how best South Africa can deal with this, despite the fact that South Africa's GDP shrunk by 0.3 percent in 2016 (SARB, 2017). Furthermore, with this research the government and policy makers will find themselves in a better position to determine whether their current debt management policies are working or need to be revised and new policies implemented that are in support of reducing debt and encouraging growth.

1.6 ORGANISATION OF THE STUDY

This dissertation consists of six chapters, which are organised as follows: Chapter 1 introduced the study by providing a general background, problem statement, objectives, hypothesis and significance of the study. Chapter 2 provides an overview of the macro economy of South Africa with emphasis on the core issues of debt and economic growth pre- and post-1994. Chapter 3 provides a critical and comprehensive theoretical and empirical literature review. Chapter 4 outlines the description of the methodology that will be used in this study, whereby Chapter 5 provides the results of the empirical estimations and what the results imply. The last

chapter, Chapter 6, outlines the conclusion to the study by summarizing key findings and their policy implications, limitations of the study and possible suggestions for further studies.

CHAPTER 2: AN OVERVIEW OF DEBT AND ECONOMIC GROWTH IN SOUTH AFRICA

2.1 INTRODUCTION

In this chapter, an overview of economic growth, external debt and government debt in South Africa is discussed. The chapter analyses and explains the trends that are observed from the graphical representations with regards to graphs indicating the movements of debt and growth. By so doing, this analysis is proved to be of key importance as it provides a picture of what the South African economy looked like pre- and post-1994. Forecasts can be made by observing the trends obtained from the graphical representation in comparison to the findings of other studies.

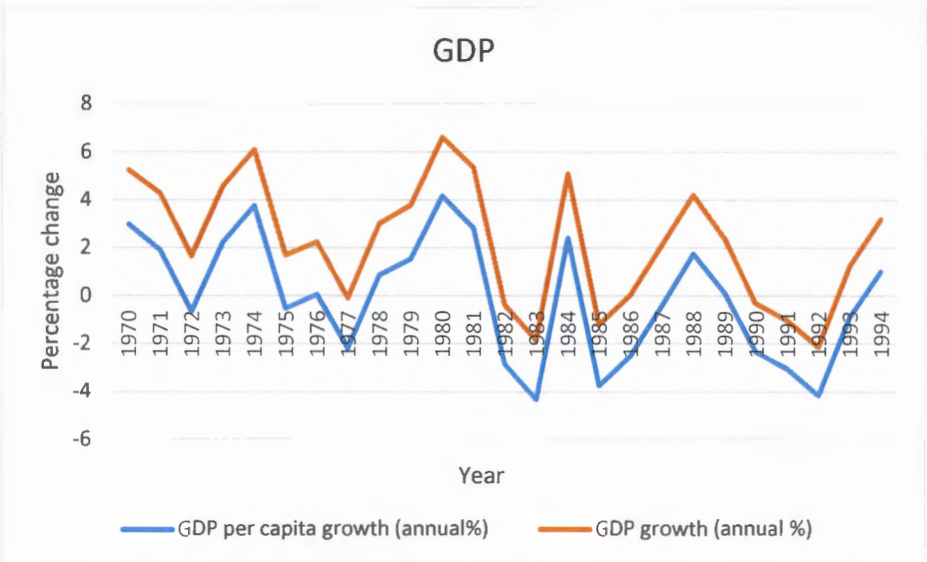
This chapter is divided into eight sections. Section 2.2 provides an overview of economic growth in South Africa pre-1994 and Section 2.3 provides an overview of economic growth after 1994. Section 2.4 provides an overview of government debt in South Africa, Section 2.5 provides an overview of external debt in South Africa, Section 2.6 provides an overview of South Africa's government expenditure and revenue, Section 2.7 provides South Africa's budget deficit/ surplus and lastly, Section 2.8 provides the conclusion of the chapter.

2.2. AN OVERVIEW OF ECONOMIC GROWTH IN SOUTH AFRICA (1970-1994)

The two most important indicators of growth are GDP annual growth and GDP per capita. Although similar, they differ in that GDP per capita measures the standard of living of the citizens, according to Ndambiri (2012), while annual GDP is more focused on the wealth of the country. It is for this reason that the graphical representation in Figure 2.1 will be a representation on both annual and GDP per capita.

Figure 2.1 serves as a representation of actual events, which have had an impact on growth in South Africa.

Figure 2.1 Growth rates in South Africa (pre-1994)



Source: Own computation with data obtained from World Bank (2016)

According to Moll (1992b), the South African economy was set for fast economic advancement after 1945. The economy enjoyed numerous economic and social developments, namely stable growth, a stable political framework, sufficient natural assets, lots of international income, refined skills and technological base, a built-up position on the worldwide trading markets and a sensibly equipped state organisational framework. However, the politically sanctioned racial segregation economy in South Africa grew gradually. South Africa's performance was relatively poor in the 1950s, which differs from the economic performance during the 1960s and 1970s.

During the final years of the politically sanctioned racial segregation (apartheid), South Africa encountered a decline in the level of economic activity, whereby economic growth was low specifically during the 1980s and mid-1990s. A portion of the reasons behind the low development during this period, incorporate civil conflict and expanding international seclusion. During the 1980s, the employment of South African citizens and economic development and growth, where recorded to be negative for eight years. This was recorded to have been the worst negative growth achieved in the 1980s, where in 1983, growth was recorded at just over -4 percent, of which these conditions only started to improve after the democratic elections in 1994 as asserted by Du Plessis and Smit (2006).

During the 1980s and mid-1990s, South Africa's industrial and economic performance was affected by international burden which was aimed towards the political and financial seclusion of South Africa, which furthermore proceeded with internal structural insufficiencies (Harmse, 2006). It was during the sanctions era that manufacturing sector moved towards relying on import substitution and independence in specific products, which brought about enormous government investments in weapon industries and oil from coal industries. According to Harmse (2006), due to the absence of FDI and economic sanctions that were placed on South Africa, the balance of payment instability reached unimaginable ratios, with the level of average foreign reserves diminishing to under $2 billion, which explains the negative growth during the 1980s in South Africa. Aggregates that were defined as an epidemic became evident between the years 1989-1993, where unemployment was recorded by StatsSA (2009) at an average of only -3,6 percent.

During 1990, growth rates were declining whereby, in 1991, a noteworthy inflation aggregate reached disturbing levels of more than 15 percent. Growth continued to decline up to a point where it reached around -4 percent in 1992, when a decline in infrastructure developments, industrial actions, rising domestic protests, global sanctions and reduced exports could have contributed to the declining growth (Moll, 1990a). As the nation moved towards the arranged and globally acknowledged democratic elections of 1994, the economy started to enhance, developing by an unobtrusive 1.2 percent in 1993, which was thereafter followed by a development of 3 to 4 percent.

According to the Department of Economic Development (2017), macroeconomic policies have an impact on employments levels, investments structure and economic growth amongst other important aspects of the country. In order for South Africa to accomplish an environment that is sustainable and efficient with regards to growth, macro-economic policies play a crucial role. Furthermore, the implementation of effective and efficient policies on the economy ought to clarify the trade-off faced by the South African government at a particular period in time and provide some form of guideline with respect to the decisions made by the government irrespective of the trade-offs. It is for this reason that the study will also look into the macro-economic policies of South Africa.

2.2.1 Macroeconomic policies imposed by government (post-1994)

It is through the democratisation procedures that commenced in 1994 (Mabugu *et al.*, 2015) that numerous investors rediscovered South Africa. The new period of political freedom was seen as the establishment of financial flourishing and incorporation. The most recent two decades have seen blended results in the sense that growth and development have been unpredictable. While disparities in the public service have been diminished, destitution levels have stayed stagnant and income inequality has expanded.

It was in 1994, when the first democratic elections were held, where ANC won the vote and became the ruling party. The maintained economic growth and development experienced post-1994 could not have been acknowledged without the guide of suitable government approaches, procedures and projects concentrating on redistribution of wealth, development and growth among South Africans. The following macro-economic strategies were established as a way to bring about improvements and deal with the after effects of apartheid on the overall growth of the country.

2.2.2 Reconstruction and development program (RDP)

The RDP strategy turned into an official macro-economic strategy of the new and improved African National Congress (ANC), even though the RDP was broadly publicised preceding 1994. The RDP contained driven financial objectives and imagined huge changes to the structure and administration of the South African economy. As asserted by Hanival and Maia (2008), the RDP had the essential target of removing racial inclinations from the social and economic structure of South Africa in order to address poverty and financial disparities that existed within the country. Apartheid had left most South Africans near the destitution line, with constrained access to sufficient education and training, causing rejection from skilled employment opportunities, weak housing conditions and heath care systems. The RDP was intended to invert these imbalances.

As demonstrated by the Community Survey (2007), more than 88 percent of South Africans, as of the years 2007/2008, have access to water, contrasted with just 50 percent of the population having had access to water in their homes in 1996. Moreover, around 64 percent of South African citizens lived in formal settlements in 1996, of which this proportion is currently standing at 70 percent. Additionally, there have been advancements in individuals' access to

education, infrastructure, transport and health care, even though a lot of work should be done with regards to change and reconstruction of the South Africa culture.

2.2.3 Growth employment and redistribution (GEAR)

Even through the implementation of the RDP in June 1996, the legislature embraced the GEAR program, whose major goal was to accomplish higher employment rates and economic development and redistribution, which would only be possible under genuinely strict fiscal limitations. The Congress of South African Trade Unions (Cosatu) and South African Communist Party (SACP) were not in support of this particular project (Mabugu *et al.*, 2015), they saw it as too restricted and similar to basic modification programs regularly endorsed by the Bretton Woods foundation of the IMF and World Bank. Even so, the policy had a financial impact and the nation's financial plan deficit lessened relentlessly throughout the following years.

GEAR macroeconomic and social improvement arrangement structure's key strategic goals included optimising economic growth in South Africa. This would produce formal occupation for work-seekers, bringing about a society in which there is sound wellbeing, education and training and making sure that different services are accessible to all. Thereby bringing about situation in which homes are secure and work environments are profitable and lastly, redistributing wealth and creating opportunities for the less fortunate. The goals of GEAR, as asserted by Mabugu *et al.* (2015), were affected by international events that were connected with the East Asian 1998 crisis. The rand depreciated significantly between April and August 1998 by 28 percent against the US dollar, provoking a fiscal strategy reaction that brought about short-term rates taking off 700 basis points.

2.2.4 Accelerated and Shared Growth Initiative of South Africa (ASGISA)

The ASGISA system was presented in 2006 as an augmentation of the GEAR program. The introduction of ASGISA, according to Hanival and Maia (2008), was not a continuation from the monetary stringency of the GEAR structure, but rather a reintroduction of which its major role was to make government consumption more viable in accomplishing social objectives. ASGISA observed the binding imperatives that remained in the way of achieving an efficient and quickened financial development and growth for South Africa, which includes the insufficient skills base, capacity of the state to lead and supply chain issues.

ASGISA, as asserted by Mabugu *et al.* (2015), was dispatched in February 2006 with the objective of quickening monetary development and growth to no less than 4.5 percent, between 2005 and 2009 and to a reasonable 6 percent normal yearly rate between 2010 and 2014. Such an enhancement in development is considered vital to reduce the degree of poverty and unemployment by 2014. ASGISA has likewise distinguished six restricting requirements to growth, namely the instability and level of the currency, the cost, productivity and ability of the national logistics framework, deficiencies with regards to skilled labour, constrained new investment opportunities, the administrative environment, the weight of small, medium and micro enterprises (SMMEs) and inadequacies in state association.

2.2.5 New growth path framework

Under the administration of Minister Ebrahim Patel, on the 23 November 2010, the government implemented the framework of the new economic growth path, which focused on upgrading development, equity and job creation. The strategies central target is to create about five million jobs within the South African borders in the next 10 years. Moreover, this system indicates the government's degree of dedication concerning job creation in all economic strategies. Furthermore, the new growth path strategy recognises and incorporates systems and procedures that will lead to a developed and comprehensive nation, whilst taking into account South Africa's formative plan. The new growth path strategy distinguishes interests in five key regions, namely water, housing, communication, energy and transportation. Supporting elevated amounts of public investment in these key areas will lead to the creation of jobs with respect to the construction industry as well as infrastructure operation and maintenance (Hanival & Maia 2008).

The new growth path strategy sees the framework program as a trigger to assemble a nearby supplier industry for the production of the segments for the build program. Specific measures, especially changes to acquisition approach and direction are recognised to guarantee that this is accomplished. Dangers incorporate the still delicate global recovery, competition and the joint effort with the new rapidly developing economies and competing interests locally. Numerous measurements to a fruitful growth strategy reflected in the new growth path include direct government activities and putting resources into economic infrastructure that will acquire future returns and tax revenue.

2.2.6 National Development Plan

The National Development Plan (NDP) is a long-term South African development strategy (Mabugu *et al.*, 2015), which was created by the National Planning Commission in a joint effort and counsel with South Africans from different backgrounds. The NDP was established on six core basic principles that speak to the wide targets of the plan to eliminate poverty and decrease inequality; the NDP expects to accomplish the accompanying targets by 2030:

- Encouraging South Africans to be dynamic in their own particular development by reinforcing democracy-based systems and holding their government responsible
- Uniting South Africans of all races and classes around a typical programme to eliminate poverty and decrease the level of inequality
- Increasing economic growth levels, encouraging exports and making the economy more labour absorbing
- Focusing on key abilities of both individuals and the nation; these capabilities incorporate skills, social security, strong institutes, infrastructure and partnerships within the nation and with key global partners
- Developing an efficient and developmental state
- Strong leadership within the society that works together to deal with the issues that South Africans have.

This should be possible by examining the fundamental reasons behind inequality and poverty by diverting the focus of policy-making from short-term based strategies to long-term based approaches based on sound proof and reason. At the centre of the NDP strategy, the NDP intends to guarantee the accomplishment of an improved, decent standard of living for every South African by 2030. A better than average way of life comprises the accompanying core components: social protection, housing, water, power and sanitation, clean environment, safe and dependable public transport, adequate nutrition, quality education, training and skills improvement, employment, safety and security, quality health care services and recreation and leisure

2.2.7 Joint Initiative for Priority Skills Acquisition (JIPSA) strategy

According to the South African Debt Profile (2012), one of the major components identified to have an impact on economic growth in South Africa was the shortage of skills over various

categories. Due to this, the JIPSA was established in 2006 as the skills strengthening arm of the ASGISA strategy. JIPSA is a joint initiative lead by the government and businesses to address major issues affecting the labour force in South Africa. JIPSA is focused on short-term intervention, driven by the objectives of ASGISA; it is not another new development structure and it is not an attempt to copy or assume control over the roles and responsibilities of existing foundations, government departments and so on.

JIPSA works with existing establishments to distinguish needs, address bottlenecks and requirements and activate abnormal state authority and assets to accomplish key objectives, initiatives to address high-level leadership and resources in order to reach their goals. The strategy has recognised primary areas for intervention: high-level building and planning abilities for the network industries, communication, transport, energy, water, town and provincial planning skills, engineering and intermediate artisan and specialised skills, with attention given to infrastructure development, planning and management with regards to health frameworks, mathematics, science and ICT language capability in public schooling. Furthermore, JIPSA is concerned with the issue of unemployed graduates Mabugu *et al.* (2015)

2.2.8 Extended Public Works Program (EPWP)

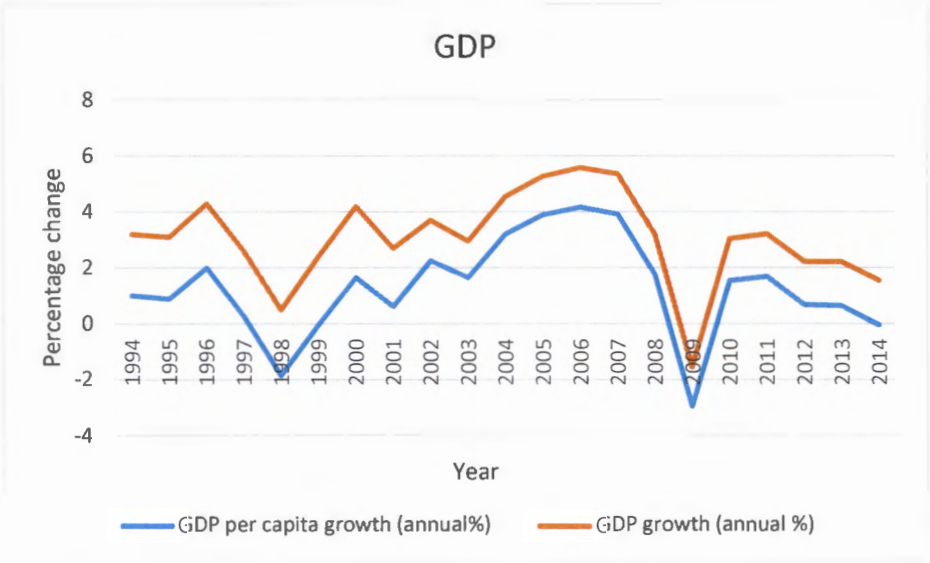
In May 2004, as asserted by Hanival and Maia (2008), EPWP was established and launched with the main objective of improving the unemployment rates in South Africa by creating employment opportunities for disadvantaged and vulnerable citizens. Concerning this strategy, employment is created through coordinated techniques, which require a labour-intensive force employed in the public sector service delivery. From March 2005 to March 2010, R100 million was contributed by the Business Trust of South Africa, aimed at providing management support at all levels of government. According to StatSA (2016), over 301 000 job opportunities were created by the EPWP, way over its initial target. 52 percent of the recipients of the EPWP benefits were woman, of which 38 percent were young adults between the ages of 18-25.

2.3 AN OVERVIEW OF GROWTH AFTER 1994

It was in the year 1994 that South Africa's politically sanctioned racial segregation apartheid ceased to exist. It is after 1994 that, claiming political flexibility might have been seen as a framework for monetary success, economic prosperity and freedom. The last two decades brought blended outcomes with regards to the volatility and instability of economic growth.

Even though inequalities concerning public services have decreased, it is rather unfortunate that income inequality has increased, though the level of poverty in South Africa has remained stagnant.

Figure 2.2 Annual growth in South Africa post-1994



Source: Own computation with data obtained from World Bank (2016)

Economic growth, according to a study by Matiti (2013), occurs when individuals take assets and augment them in ways that are more significant. Figure 2.2 is a representation of South Africa's GDP. The trend illustrates that GDP in 1994 was increasing, however, it decreased in 1997 and increased gradually from 1999-2007. It is evident that during 2008, GDP declined and later gradually increased from 2010. The graphical trends assist in explaining the possible events that might have caused these fluctuations, including the 2008/9 recession. Moreover, economic growth alludes just to the amount of goods and services created, not the way in which they are created. According to Ayres and Warr (2001), GDP measures development in monetary related terms and does not take into account other aspects that might affect growth.

In 1999-2000, the South African economy was seen to have recovered slowly, in light of the international Asian crises and the increasing domestic interest rates that were initiated to battle fluctuations with regards to the exchange rates in 1997/8 (South African Economic Outlook, 2002). Political improvements made it possible, according to Mabugu *et al.* (2015), for the representation of the South African economy to the international economy and for the

enlivening of new interest in its monetary potential. South Africans have abruptly wound up in a world where there is a relatively high amount of rivalry and where various rising and developing nations are not always marginally ahead in the race to acquire access and increased investment funds. Due to the introduction of the system of the new government, the South African economy recuperated rapidly, of which the development in GDP enhanced to an average 3,4 percent during 1994 and 1997 as asserted by the Economic Data Report (2015). This was due to the fact that, during 1995 and 1997, the country experienced a vast inflow of portfolio capital and the nations exports expanded, even though the rand exchange rate continued to deteriorate to some degree (Economic Data Report; 2015). This high economic development briefly declined in 1997 to just above -2 percent (as indicated in Figure 2.2), when economic growth decreased to just 0.5 percent as exports and foreign capital inflows diminished because of different global financial developments such as financial issues that were related to southern Asia, which started to spread to South Africa, a reduction in the price of gold and the postponed impacts of a somewhat stable rand in 1997, leading to a decline in economic activities. Furthermore, Kumo *et al.* (2014) asserts that during the beginning of 1998 the possible dangers associated with the financial soundness of the county and concern about the long haul prosperity of the economy persuaded policy makers that initiatives must be taken in order to balance out the financial conditions in South Africa, with as little postponement as could be expected under the circumstances.

Moreover, the three-year time frame of 2005 to 2007, serves as a representation of the economy's best development spurt as asserted by StatsSA (2014), as annualised GDP rates surpassed 5 percent in each successive year. Due to the global financial crises that took place in 2008, it is evident that the South African economy took a knock and as a result suffered the consequences of this crisis, leaving the country with a GDP growth of -1,5 percent, which growth was recorded to be negative for the year 2009. Even though this economic recession was short lived, the South African economy was left with the after effects, mostly seen in the labour markets. In South Africa's modern history, the period preceding the economic recession is a representation of the longest uninterrupted continuous positive growth in the country.

According to the Industrial Development Corporation (2013), growth bounced back and was recorded at just below 4 percent in 2010. This was a significant increase and the 2010 FIFA World Cup could have been the major reason. As the country needed to prepare to host the World Cup, economic activity started to increase in the sense that jobs were created, money

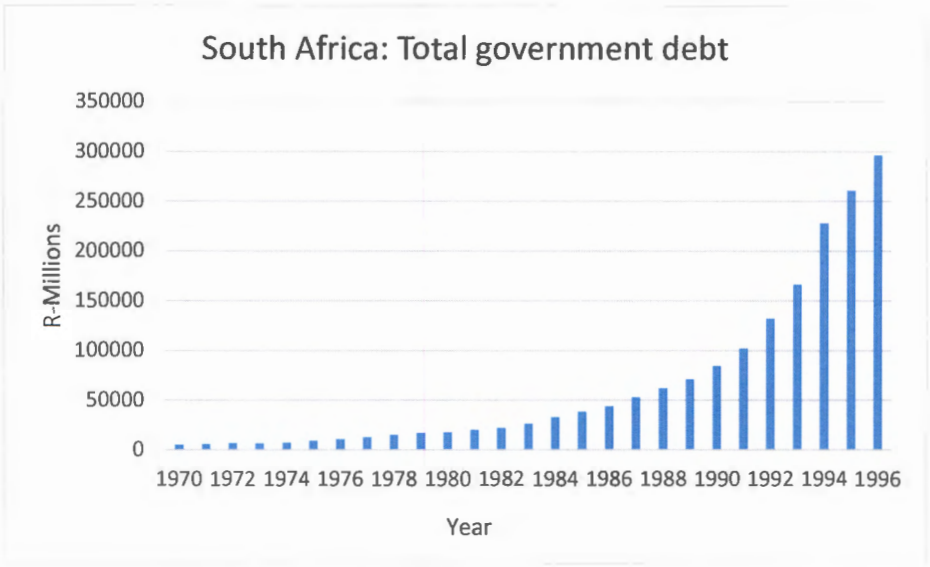
was coming into the country and it left South Africa better off than it was in 2009. It was reported by StatsSA (2014) that growth had increased by 3.9 percent in 2010, 3.4 percent in 2011, 2.6 percent in 2012 and by 2.2 percent in 2013. South Africa is, of recently, the biggest SSA economy, which represents over 33 percent of SSAs GDP and 40 percent of its exports. In addition, South Africa has solid financial and exchange connections to the worldwide economy. These development rates have stayed below the yearly 6 percent average that was targeted by ASGISA.

Recording at just 1.5 percent, the South African growth rate slowed down in 2014, which was the lowest growth rate since the worldwide monetary crisis. The country's economy was influenced by its most extended industrial activities, since the end of politically sanctioned racial segregation and the declined lack of demand and interest from trading partners. A number of factors were seen to have contributed to dragging down economic growth in South Africa, which include having a remarkably insufficient electricity supply, different infrastructure gaps, sluggish local demand and fluctuating exchange rates. However, it was suggested by Kumo *et al.* (2014) that, growth rates in SA could bounce back to 2.0 percent in 2015 due to the new projects that are created in view of making enhancements in the international economy, the efficient fulfilment of government ventures such as the establishment of the Medupi Power Station and new investment opportunities.

2.4. AN OVERVIEW OF GOVERNMENT DEBT IN SOUTH AFRICA

Figure 2.3 below is a representation of government debt levels in South Africa from 1970 to 1996. The trends observed from the graph illustrate government debt levels gradually began to rise, even though the increase was not significant enough to cause a huge reaction. It is only during the late 1980s and beginning of the 1990s that debt levels began to rise significantly. According to the South African Debt Profile (2012), the extent of external debt, more specifically external bonds, has been higher than during 1995 to 1998, when it was about 5 percent of aggregate government debt. From that point forward, it has extended by 8,6 times in rand terms. These attributes demonstrate a need to give cautious thought to the degree and way of raising new government debt in South Africa.

Figure 2.3 Government debt levels in South Africa (1970-1996)



Source: Own computation with data obtained from Quantec (2016)

Due to the introduction and implementation of the medium term expenditure framework, Matiti (2013) indicates that, public financing and debt levels in South Africa has experienced numerous changes. Presently in South Africa, the execution of the fiscal policy performance has blended results. For example, debt as a percentage of GDP expanded insignificantly in the course of recent decades. Subsequent to tumbling from a high of 40 percent in the 1960s to 32 percent in the 1980s, according to the South African Debt Profile (2012), it began to rise significantly during 1984. However, as of late, South Africa's debt has expanded impressively. Preceding the worldwide economic emergency, policies seemed to have not won the debt battle, as government debt to GDP proportion expanded from about 4 percent in 1994 to 4.5 percent in 1995.

Due to the evidence depicted in the graph above, this illustrates that fiscal adjustments are required with a specific goal to settle the debt progression as asserted by South African Debt Profile (2012). The aggregate debt levels of the government in connection to the local security market, is relatively enormous, as government bonds are a noteworthy determination of the qualities of the domestic security market. The introduction of new government securities being brought up in the local market has expanded fundamentally and is notably higher today than during the 1990s and 2000s. Government debt administration has advanced generously since the 1970s when the need to build up the debt capital market was recognised. Moreover, it was

during this time that government debt levels started gaining momentum. The state only issued debt about three to four times a year before 1990, of which it is clear from figure 2.3 that, it was only in the 1990s that debt levels started to rise significantly. However, according to Kumo *et al.* (2012), as and when required, bonds were issued at standard rate and issuance normally matched with the maturity of the bonds' dates.

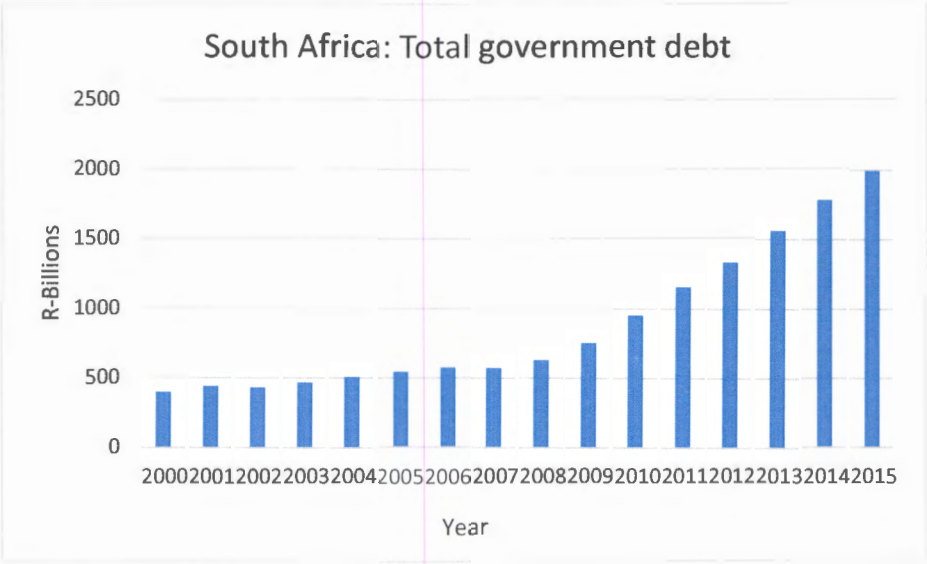
Due to the implementation of sanctions, South Africa's debt is domestic, unlike in most developing nations. Before the end of politically sanctioned racial segregation, risk premiums were gigantic and treasury bonds exchanged at an enormous markdown. In 1993, the nation was on the edge of a debt emergency and had a terrible credit score as the level of government debt was rising. The government began to utilise macroeconomic systems from the year 1994 as a guideline for debt management techniques. A formal bond exchange was established in 1996, according to the South African Debt Profile (2012), in order to advance the debt capital market and make it possible for self-regulation. As a result, the SARB was selected as a settlement agent and issuer of government bonds. By the start of the year 1998, auctions were conducted frequently at specific dates. Twelve essential dealers were named to guarantee market effectiveness and transparency. Preceding 1999, the fundamental target of debt management was to build up the local market and advance an adjusted development profile.

After the democratisation election of 1994, according to a study by Bhorat *et al.* (2013), the new vote-based South African government acquired an economy with financial and other macroeconomic problems which had to be rectified. These were as an after effect of the frail economic growth that came about due to relatively low investments and absence of financial certainty that added to lower income accumulation in the nation, before the 1994 elections. Moreover, political strain, consolidated with local and global recession around then, implied that the legislature could not implement expenditure cuts, which required high borrowings to meet its costs. The new law-based government through GEAR framework, intended to diminish the traditional budget deficit to GDP ratio to underneath 3 percent every year, contrasted with the 7 percent level at freedom.

Furthermore, the changes in the budgetary execution lead to sharp increases in the proportion of public debt to GDP since the mid-1990s. As asserted by Klein (1994) and Ariyo (1997), the crucial element that is making government debt increase is the dependence on external assets to supplement capital development in the domestic economy. Therefore, a high interest rate

installment will result in a heavier shortfall with regards to the current account and the greater the debt burden on South Africa.

Figure 2.4 Government debt levels in South Africa (2000-2015).



Source: Own computation with data obtained from SARB

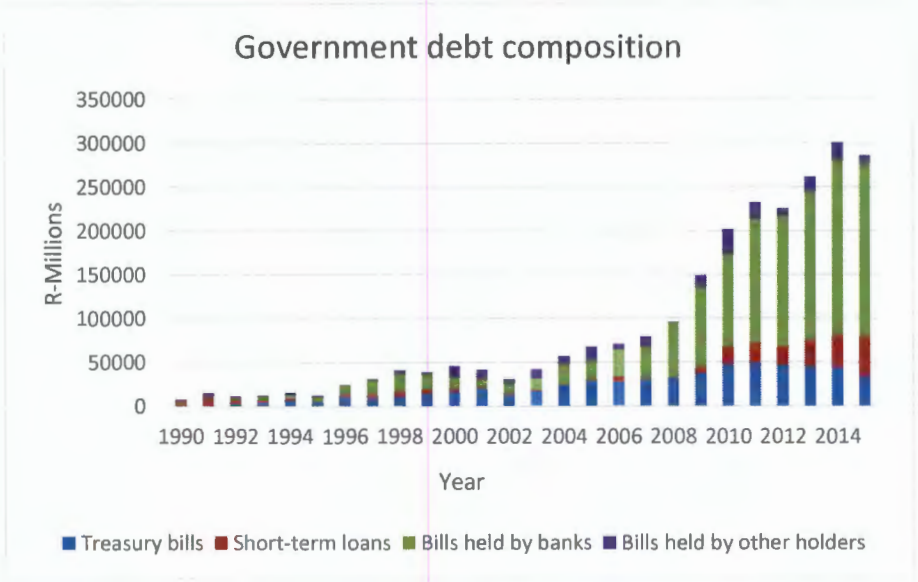
As a major aspect of the project tax reforms and organisation capacity enhancements, the MTEF, according to Matiti (2013), was attempted during 1997-2000. This is significant in the sense that, by observation, in 2007, the level of debt began to rise significantly. From the beginning of 2006, the government took measures to eliminate further increments in their debt levels, which were not effective (Matiti, 2013). After expansions preceding 1994, according to the South African Debt Profile (2014), the net government debt continued in an increasing pattern and was recorded at just above 45 percent from 1995, of which in 1996, government took measures that counteracted further increments. In 2000, the debt level declined slightly compared to the debt level of the following year. From that point onwards, reduced deficits and government surpluses assisted in bringing the level of government debt down to just under 22 percent in 2008 (Hanival and Maia, 2008).

Because of the global crises in 2008, which affected numerous aspects of the South African economy, the debt level was over 1,3 billion rands in 2012 (StatsSA, 2012) and is seen to keep on increasing reasonably throughout the following years as deficiencies proceed. Following 2009, as asserted by the South African Debt Profile (2012), debt levels continued to rise as the

government had to find financial means in order to deal with the aftermath of the financial crises in which the government experienced financial deficiencies to give countercyclical fiscal stimulus to deal with the worldwide recession. Additionally, the government began moving away from financing budget shortfalls through the utilisation of banks, towards non-bank sources, which expanded the degree of danger (Mabugu, 2015).

The connection between monetary policy observations and debt administration issues to a great extent, is through the flagging impacts of debt levels and development structures on the credibility of policy makers (Bhorat *et al.,* 2013). Moreover, as of late, debt administration concerns have subsided fairly, with the appearance of low inflation and diminished public deficits. Debt administrators will confront diverse difficulties, as debt-to-GDP ratios have started to rise once more. In this way, there should be an accentuation on enhancing the proficiency of debt management procedures, which can possibly deliver budgetary savings as illustrated by The Economic Data Report (2015). High reliance on the local debt market sector additionally is made attainable by the presence of an exceedingly liquid and modern bond market in the country.

Figure 2.5 Composition of government debt in South Africa



Source: Own computation with data obtained from SARB (2016)

Figure 2.5 is a representation of government debt composition, which includes treasury bills, short-terms loans, bills held by banks and other holders. As illustrated by the trends observed

from the graph, the total loan debt of government is relatively high, most especially in 2014. According to Martin (2009), government debt is one strategy for financing government operations; however, it is not the only technique as governments can likewise create money to adapt to their debts, in this way eliminating the need to pay interest on their debts. This practice decreases government interest costs as opposed to really eliminating the government debt and could bring about hyperinflation if utilised unsparingly. According to The South African Debt Profile (2012), government debt is made through different instruments including bonds, borrowing from commercial banks, overdrafts from the Central bank and treasury bills.

According to Bhorat *et al.* (2013), government debt servicing has advanced considerably since the 1970s when the need to build up the debt capital business sector was recognised. Before 1990, the state issued debt just three or four times per annum. Bonds were issued at standard, as and when required and issuance normally concurred with bonds' development dates. It is during this period that there were no liquid benchmarks, formal auctions, dominant market rates and dynamic optional markets. Furthermore, Bhorat *et al.* (2013) elaborates that unlike most developing nations, because of sanctions, South Africa's debt was fundamentally residential. Before the end of the politically sanctioned racial segregation, risk premiums were immense and treasury bonds exchanged at enormous discounts. During 1993, South Africa was on the edge of a debt emergency and had a negative assessment from the Financing Cooperation (FICO). From 1994, government began to utilise macro-economic systems to guide debt administration procedures. During 1996, a formal bond exchange was framed to advance the debt capital market and take into consideration self-regulation. The SARB then was delegated as a guarantor of and settlement operator for government bonds. Starting in 1998, auctions were directed consistently at stipulated dates.

During March 2008 and March 2013, treasury bills were set to have been marketable. For securities, 99 percent was attractive while the remaining 1 percent was non attractive (StatsSA 2013). Figure 2.5 illustrates the holders of outstanding treasury bills, which consist of the banks, other holders and monetary authorities, as asserted by the Economic Data Report (2015), with the banks being the predominant holders, trailed by different holders and the monetary authorities individually. The property of outstanding bonds can be grouped into two categories fundamentally, namely the holders of short-term bonds which have a three-year outstanding maturity time frame and the long-term bonds which exceed the three-year maturity time frame.

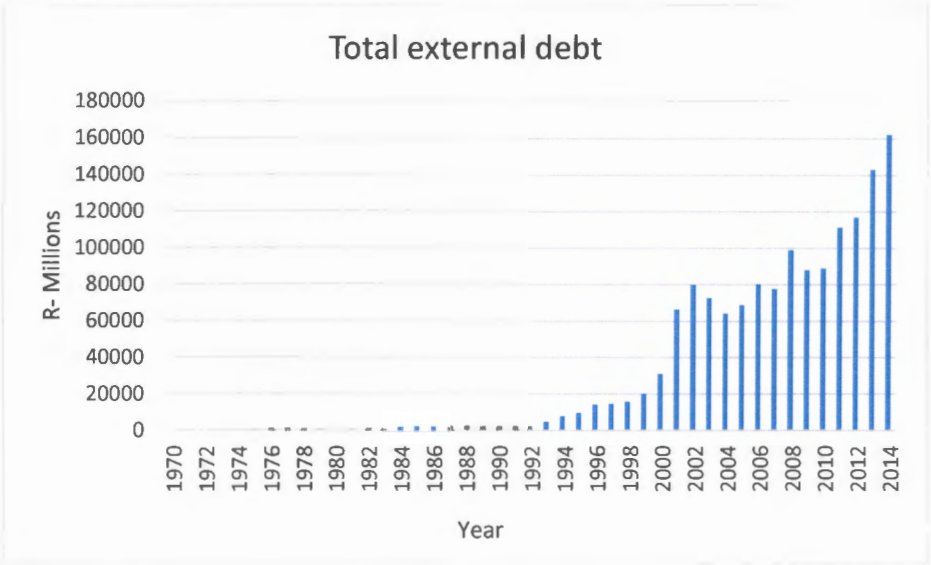
According to the South African Debt Profile (2012), the Public Investment Corporation has diminished its holdings from 38.3 percent of the aggregate outstanding supply of short-term bonds as of end March 2008 to 3.3 percent as of end March 2013. Then again, the non-money private sector has been expanding its securing of short-term bonds, with its holdings expanding from 13.3 percent as of end March 2008 to a high of 45.6 percent. Banks are the prevailing holders in this classification, holding a yearly normal of 51.8 percent of the aggregate short-term bonds around the same time. In 2012, they lost their predominance to the non-money private division, but by end March 2013, they had recaptured their position, holding 51.3 percent of the aggregate short-term bonds.

The South African government's reaction to debt, according to Hamilton & Viegi (2008), made its bonds more alluring. In this manner, it has turned out to be more reliant on the requirements of creditors, namely more subject to investor observation and assumption. Furthermore, according to financial investors, South Africa still needs reliability and remains a generally hazardous place in which to invest; the overhauling of South Africa's public debt remains costly.

2.5 AN OVERVIEW OF EXTERNAL DEBT IN SOUTH AFRICA

In this section, external debt in South Africa is analysed with regards to the total external debt owed by South Africa, external debt stocks, which incorporate short-term and long-term debt stocks, an analysis on the ratio of foreign debt to GDP and foreign currency-dominated debt is examined. An analysis on interest payments on foreign debt is also examined; which incorporates long and short-term interest payments on debt. GDP, foreign debt and government debt is analysed as well as an analysis on government expenditure and revenue, as it is important to understand how much money the government has and receives and because the government borrows money abroad, it is important to understand where the money is being spent. Lastly, an analysis on the national government deficit in South Africa, as a proportion to GDP, is analysed.

Figure 2.6 South Africa's total external debt



Source: Own computation with data obtained from SARB (2016)

Figure 2.6 is a representation of foreign debt levels of South Africa. Fluctuations observed in figure 2.6 illustrate that during the early 90s, external debt levels were manageable, but as from the year 2008/2009, external debt levels have been rising significantly. With the rapid development of external debt and the poor monetary performance of the local economies, according to Iyoha (1999), the SSAs debt crisis has taken a turn for the worst. In respect to trades and economic activity as measured by the Growth National Path, SSAs debt is the highest as compared to other regions (Klein, 1987; Iyoha & Iyare, 1994; ILO, 1995).

South Africa was struck by a noteworthy foreign debt emergency in 1985, as asserted by Naraidoo (2013), when numerous banks including Chase Manhattan, pulled back significant credit lines. Moreover, the worldwide debt emergency emerged as a consequence of the following: increased levels of borrowing associated with developing countries; careless loaning by international banks during the 1970s; the breakdown of the global commodity prices of which petroleum was the most dominant during the mid-80s; increments in worldwide interest rates in 1982; and lastly the amazing increment in external borrowing that occurred before the debt crisis was activated by the shocks related to the oil prices during 1973 and 1979, which brought about intense current record shortfalls in countries that are underdeveloped and that do not produce oil.

Furthermore, the banks declined to move over existing credits and brought in a hefty portion of the short-term loans. Accordingly, the value of the rand depreciated abruptly, causing the government to shut down its foreign and financial trade markets. Not able to meet commitments all of a sudden, the legislature pronounced a stop on debt repayments of around US$14 billion of South Africa's US$24 billion aggregate foreign obligation of debt. During the halt, government authorities met with agents of loan banks, where they reached consensus and formulated a new rescheduling agreement, which recommended expanding the 1985 debt freeze until June 1987 and reimbursing 5 percent of the aggregate remaining debt by April 1987.

Furthermore, an underlying instalment of US$420 million was made in mid-April 1986 (Iyoha, 1999); however, extra arrangements in 1987 and 1989 expanded a large number of these advances. The sharp foreign debt development in the post-1989 period is due to a few elements, including rescheduling and renegotiating of SSAs foreign debt, which later lead to increases to the debt stock, higher financing costs, decreases with regards to terms of trade, restructuring of exchange rates and uncontrolled fluctuations with regards to export earnings.

According to Zouhaier & Fatma (2014), South Africa's key issue in reimbursing its advances or debt was huge, yet undisclosed and part of South Africa's debt was dominated in non-dollar currencies, yet appreciating in dollar terms as the rand deteriorated. Moreover, by the year 1990, South Africa reimbursed between US$1.7 to US$1.9 billion of debt, where some foreign financiers were progressively eager to refinance maturity for South African credits. An example was in 1990, where about US$300 million of US$900 million carrier bonds in Deutsche and Swiss were replaced. Furthermore, during the years 1985-1990, external borrowing from South Africa ceased to exist. This reduced South Africa's schedule for debt reimbursement, which made South Africa a net capital exporter in the late 80s. South Africa decreased its aggregate uncovered foreign debt to under US$20 billion during 1992, down from almost US$24 billion in 1985, as indicated by the South African Reserve Bank. However, currency fluctuations led to South Africa's worldwide debt going back to US$25.8 billion toward the end of 1993, including rand-dominated foreign debt, which kept on expanding in 1994.

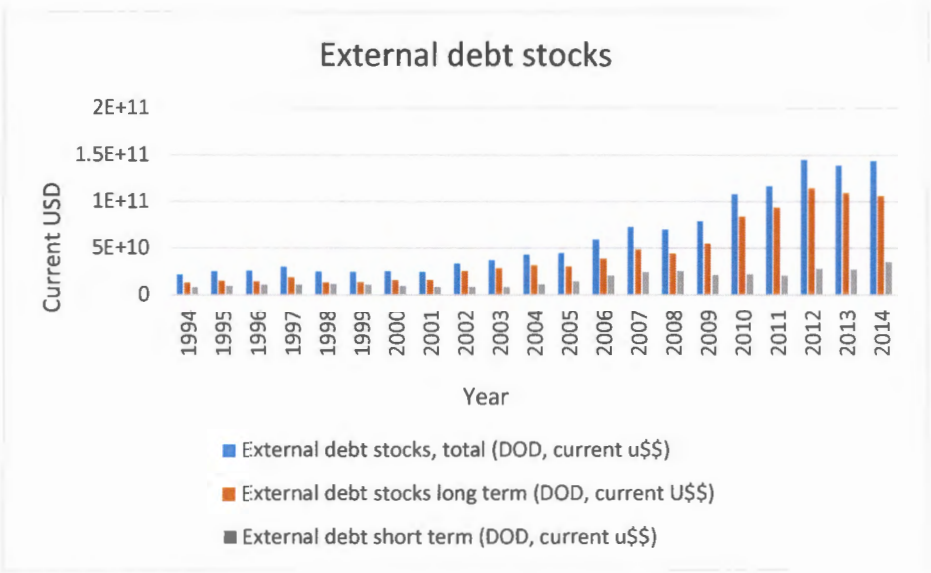
During 1994, the government paid back about US$500 million with regards to their foreign debt. Around then, South Africa was viewed as a low debt country by financial institution

criteria, where its foreign debt to export proportion amounted to around 60 percent and the foreign debt to GDP proportion amounted to 15.1 percent, as indicated by South African Reserve Bank reports. Moreover, in the second half of the year 1994, South Africa posted a net capital inflow of more than R8 billion. South African foreign debt expanded in 1995, when gross foreign debt increased to almost 22 percent of GDP.

After 1994, external debt in South Africa continued to rise substantially, where debt levels shot up and recorded just below R100 000 million. This was rather high, compared to the previous years, of which the global economic recession played a role in the increased levels of external debt in South Africa, as economic activity had declined which was identified by the country's decline in GDP. It is for this reason that South Africa needed to acquire financing as a recession refers to a decline in GDP/national output. In order to deal with the after-effects of the global recession, as a recession has a tendency to affect the economy in a negative way. The impacts of a recession as asserted by Veric & Islam (2010) are as follows: A fall in GDP will bring about an increase in unemployment, reduced wages, a reduction in tax revenue, budget deficit expansion, a reduction in output levels and, lastly, an increase in government spending.

It was after the recession that the levels of debt dropped to just below 100 000 million rands, though the decrease was not significant enough. From the year 2011, debt levels continued to increase, which was anticipated, as in 2010, South Africa hosted the FIFA World Cup, which required developments and infrastructure resulting in the need to acquire capital. South Africa needed to upgrade transportation, call centre systems, freight services, airport services and bus systems, information technology and communication centres, electricity supply, international broadcasting centres, construction of new stadiums, tourism and accommodation, health and medical services, which all contributed to the increase of debt in South Africa. Debt levels continued to spiral; in 2014, the country owed just over 160000 million rands, which is troublesome for the country as high amounts of debt can lead to low levels of investments (Da Veiga *et al.,* 2014).

Figure 2.7 South Africa's external debt stocks



Source: Own computation with data obtained from World Bank

Figure 2.7 indicates the total stock of external debt in South Africa, which consists of short-term and long-term debt stocks. According to Stats SA (2015), the total foreign debt in South Africa reached R 1.467 trillion or 40.7 percent of GDP toward the end of 2013/14. This was mostly because of an expansion in long-term debts given to the banking sector in the first quarter of 2014. According to the World Bank (2015), regarding the total external debt stocks in South Africa, total debt stocks were approximately $144 006 000 000 as from the beginning of 2014. In the course of recent years, external debt stocks have fluctuated between $144 959 000 000 in 2012 and $21 671 000 000 in 1994. The World Bank further asserts that short-term external debt stocks amounted to about $35 042 000 000 from the beginning of 2014, whereas long-term external debt stocks accounted for about $106 377 000 000 from the beginning of 2014. Furthermore, in recent years, short-term debt stocks fluctuated between $7 739 000 000 in 1994, to about $35 042 000 000 in 2014, as compared to long-term external debt stocks that fluctuated between $13 035 030 000 in 1994, to about $114 347 000 000 in 2012.

Long-term external debt is characterised as debt that has a unique or augmented maturity of over one year that is owed to out of state people or businesses by occupants of an economy. This debt is repayable in currency, goods oeven services, whereas short-term external debt is characterised as debt that has a unique maturity of one year or less. This simply implies that,

with regards to long-term external debt stocks, because they have a maturity of more than one year, the interest rate on the debt will be higher, compared to a short-term maturity debt.

In 1994, the total external debt stocks were just under 24 percent of GDP, which is below $50,000,000,000, as contrasted with the other years after 1994, this could be attributed to the fact that the apartheid era ceased to exist, and hence the external debt stock levels were still quite low and manageable. It was only after 1994 that the debt stock levels began to rise. Due to the aftermath of the apartheid government, the new government had to develop policies and strategies, which would lead to the improvement of the country and its people. This could have been the reason why government saw it fit to acquire capital assistance from international sources, in order to develop and revamp the 'new' South Africa. During the years 2008 and 2009 debt stocks were just over $50 000 000 000, which indicated a rise in the stock levels of debt compared to previous years. In 2010, however, a noticeable increment was observed when the total stock of debt in South Africa reached just above $10 000 000 000. In 2012, the debt stocks of South Africa shot up to just below $1 500 000 000 000. One factor that would have contributed to the debt stock increasing was the labour unrest that occurred in the mining sector.

However, in 2014, South Africa's debt stock had declined by less than 2 percent as compared to 2013. This does not necessarily imply that the debt stock of SA is declining, but rather, it is just better than it was in the previous year. Moreover, as observed from the figure 2.7 it is evident that short-term external debt stocks are lower, compared to long-term external debt stocks. This is because when South Africa borrows capital abroad, due to the maturity period of the loan, SA is somehow forced to loan on a long-term basis rather than on a short-term basis, because repaying back the money on a short-term basis might be very difficult as indicated in the study of Van Der Merwe (1993), as compared to when they have enough time to be able to raise that money in order to pay back their debt. However, it is not advantageous for SA to borrow capital on a long-term basis as now they will be faced with higher interest rate repayments on their debt, as compared to if they would have borrow capital on a short-term basis, their interest repayments would have been lower. It also is understandable that SA loans money on a long-term basis due to the ability to repay the capital.

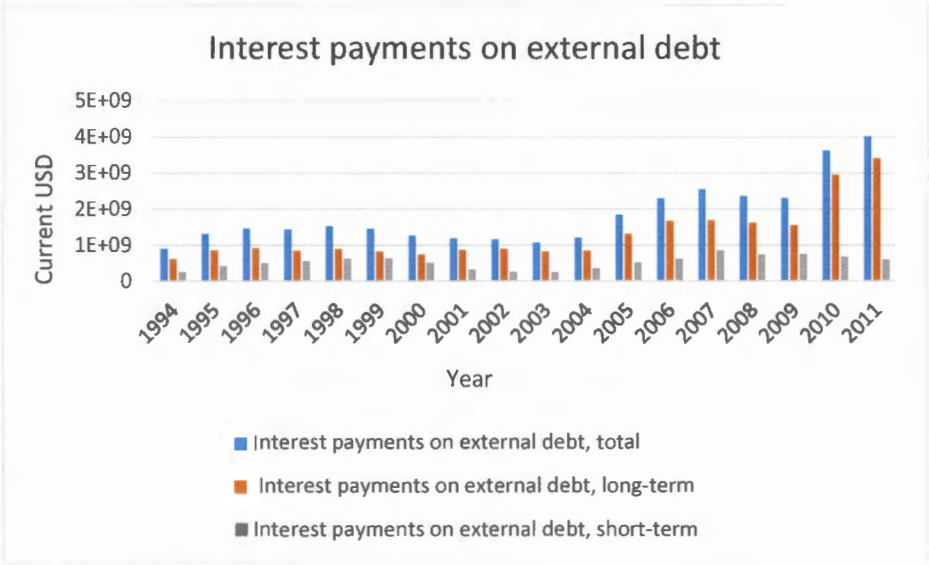
It can also be observed from Figure 2.7 that as from 2001, long-term debt stocks gradually continued to rise in comparison to short-term external stock, although short-term stocks are not as stable. During 2001 and 2003, stocks began to rise. Moreover, during 2004, short-term

stocks rose again and declined from 2009 to 2014. Despite the expansions in the nation's supplies of long-term debt, it is remarkable that South Africa had no essential back payments on its long-term debts from 2000 to 2011 (Ayadi and Ayadi, 2008).

Nations with larger amounts of domestic financial development grew by around 0.7 percent a year as compared to those that are domestically undeveloped (Madubeko, 2010). This applies to the South African economy, which has a profound, liquid and refined bond market. Subsequently, the South African government is ready to meet a sizable portion of its national subsidizing prerequisites from the local capital market when contrasted with external sources of money, as shown by the strength of domestic debt in the nation's aggregate total debt portfolio.

It is observed from Figure 2.7 that the stock of external debt increased significantly by approximately 2 percent from 2011 to 2012 with both the long-term and short-term external debt stock expanding at the same pace. This, however, was different as contrasted to 2011, when increases in the short-term debt stock, which increased by 17 percent developed twice as much as compared to the long-term external debt stock. The stock of short-term debt, as a percentage of total debt, was 26 percent toward the end of 2012, which was almost the same in the previous year. External debt stocks in 2014 were somewhat similar to those in 2012, which illustrates that not much improvement has been made concerning the government paying off their debts; instead, the debt stocks are rising.

Figure 2.8 Interest payments on external debt



Source: Own computation with data obtained from World Bank

The most recent value for interest payments on external debt in South Africa was about $4 681 684 000 in the beginning of 2014. In the course of recent years, the total interest payments of external debt have fluctuated between $4 681 684 000 in 2014 and $907 029 000 in 1994 as asserted by the World Bank (2016). As portrayed in figure 2.8, though not forgetting that national debt interest instalments expanded in nominal terms subsequent to 1994, it is outstanding that the impact and weight of debt servicing on the economy has declined throughout the years as appeared by the declining debt interest installments and the debt interest installments as a ratio to GDP.

Moreover, because this study is about investigating the relationship of debt and growth, the interest payments on debt are of key importance, as interest payments refer to the actual measure of interest paid by the borrower in currency terms, goods or even services in the year specified. This is a broad term, as it incorporates interest paid on long-term debt; interest paid on short-term debt and IMF charges. It is also of great significance to differentiate between long-term and short-term interest payments of external debt.

Long-term interest payments on external debt refers to the actual measure of interest paid by the borrower; that is by South Africa, in cash, goods or services in that specified year. Characterised as debt that is owed to "out of state people", long-term debt is broadly identified

as debt that is payable in cash or through goods and services and has a unique maturity of more than one year. As asserted by The World Bank (2015), interest payments on external debt, long-term in South Africa was around $1 193 029 000 in the beginning of 2015. In the course of recent years, long-term interest payments have fluctuated between $617 330 000 in 1994 and $3 745 962 000 in 2014.

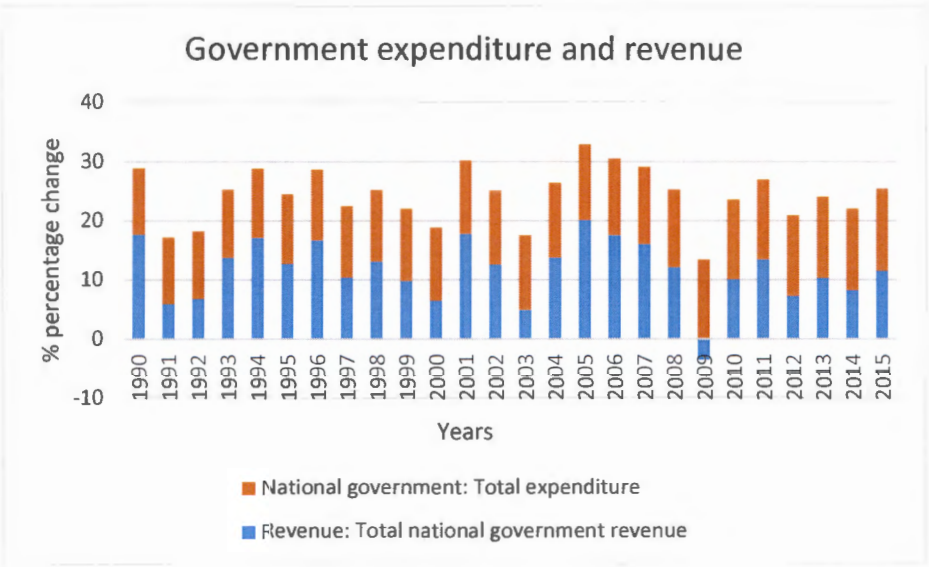
Interest payments on short-term debt can be referred to as the substantial amount of interest paid by the borrower in cash, goods or services in the year determined. Short-term interest payments incorporate interest paid on long-term external debt, IMF charges and interest paid on short-term debt. The most recent value of interest instalments on external debt, short-term in South Africa was $934 365 000 as of the beginning of 2014. In the course of recent years, short-term debt interest has changed between $246 510 000 in 2003 and $934 365 000 in 2014 (World Bank, 2015).

Throughout the decades, interest payments of external debt seem to increase gradually as the lowest interest payments where between 1994 and 2001. This could have been because, after the 1994 elections, South Africa was still trying to stand on its own two feet, following the aftermath of apartheid. After the year 2005, interest payments started to rise significantly. As observed in figure 2.8, interest payments on long-term debt are significantly higher than short-term interest payments. This is because short-term debt's period of maturity is lower than that of long-term and countries, including South Africa, cannot afford to pay their debts in a short period; hence, the country is forced to take debt on a long-term basis to be able to raise revenue to repay the debt.

2.6 AN OVERVIEW OF SOUTH AFRICA'S GOVERNMENT EXPENDITURE AND REVENUE

Because the study's focus area is on debt and growth, it is also vital to reflect on the government's revenue and expenditures, since debt is associated with the government not having enough revenue; hence, they have to acquire capital internationally. It is for this reason that the study will provide a brief discussion on how government spends its money, what they spend it on and how they earn their revenue.

Figure 2.9 Government expenditure and revenue



Source: Own computation with data obtained from SARB

Figure 2.9 illustrates government expenditure compared to government revenue in South Africa. In most economies, government expenditure tends to overpower the government revenue. In other words, the government ends up spending more that they can afford and budget deficits occur. As a result, the government is forced to acquire financial assistance, be it to correct the budget deficit or to deal with the unforeseen expenses. Government spends billions of rands trying to improve the quality of life of its citizens. During 2009 and 2010, the monetary allowance for government spending was R773 billion (Manuel, 2009). An extra R55 billion was to be spent on debt servicing and R6 billion was kept as a back-up for crises, thereby creating over R8 billion expenditure by the government

It is important for the study to emphasise where the government obtains its revenue and how the government spends its money. What the government spends money on is also the core reason why the government ends up having to borrow money, resulting in increased government debt. As demonstrated by Schoeman (2008), debt is the net aggregation of budget deficits. It is critical to take into account the major expenses of the government, as they constitute the central factors behind government debt.

2.6.1 Protection services

Protection services have a financial plan that is around 13 percent of national spending and incorporates police, courts, penitentiaries, the defense force and intelligence services. Over recent years, the safety budget has increased in order to manage crime since the government has made this issue a priority, according to StatsSA (2016).

2.6.2 Social welfare

Accounting for 15 percent of the government's spending budget, social welfare is the second largest portion of expenditure. Social welfare incorporates old age pensions, which are aimed at giving financial security to beneficiaries when they reach the age of 60, poverty reduction work by the government and social grants. In the last nine years, individuals who get social grants have increased from a little more than three million to over 12 million, which is around 25 percent of the general population in South Africa (StatsSA, 2016).

2.6.3 Health

In South Africa, more than one tenth, which is about 11 percent, is allocated to health care. The government health spending plan pays for health care in relation to children, pensioners and unemployed individuals. The health care of South African citizens, as asserted by StatsSA (2016), is by far the most important part as half of the general population in South Africa is living under the poverty line and nearly 20 percent of the adults are living with HIV-AIDS.

2.6.4 Housing

For the past decade, housing has been a priority for the government of which it accounts for 7 percent of the expenditure. More than 2.3 million houses have been sponsored by the state financing following 1994.

2.6.5 Debt

An interest rate of 8 percent puts a substantial weight on the aggregate government revenue. The instalments that are made by South Africa are for debts that were acquired from the era of apartheid and in addition new debt loans that are made. It was during 1996 that the focus of the budget was fighting debt, of which it was allocated over 20 percent. Due to all the things that the government is required to do, the government borrows money for enormous frameworks

like dams that cost billions and cannot be paid off from the budget for one year. These funds originate from banks and establishments like the World Bank.

2.6.6 Economic development

Without financial improvement, we cannot create more employment opportunities or manage the long-term reasons for poverty. Moreover, water and agriculture account for 4 percent, whereas communication and transport account for 10 percent, which are huge spending items that compensate for the development of new infrastructure and projects.

2.6.7 Education

Education makes up 17 percent of the total expenditure by government. The government spends a great deal on education since the government is still paying for a portion of the accumulations from the past. A considerable number of schools in South Africa still require resources such as classrooms and toilets. Moreover, the salaries of the educators account for about 75 percent of the budget allocated to education.

2.6.8 Other expenditure

Other expenditure includes exchanges to local governments and numerous other government divisions. This also includes the expenses of provincial legislatures, parliament and other public bodies that fall under any alternative classification listed here.

An intriguing aspect with respect to the expense list is that, they are genuine pure spends and not investments that are expected to get any long haul advantages. For instance, the government keeps on spending money on giving income security advantages, which might not have any extension for future returns. Costs can likewise be for financing infrastructure advancements or education, which could possibly produce benefits and returns with direct and indirect advantages, which include job creation, changes in business and an increased population that pays tax. Furthermore, the National Treasury (2008) identifies government revenue; fines, taxes, incomes, inflation and debt, as sources of government revenue

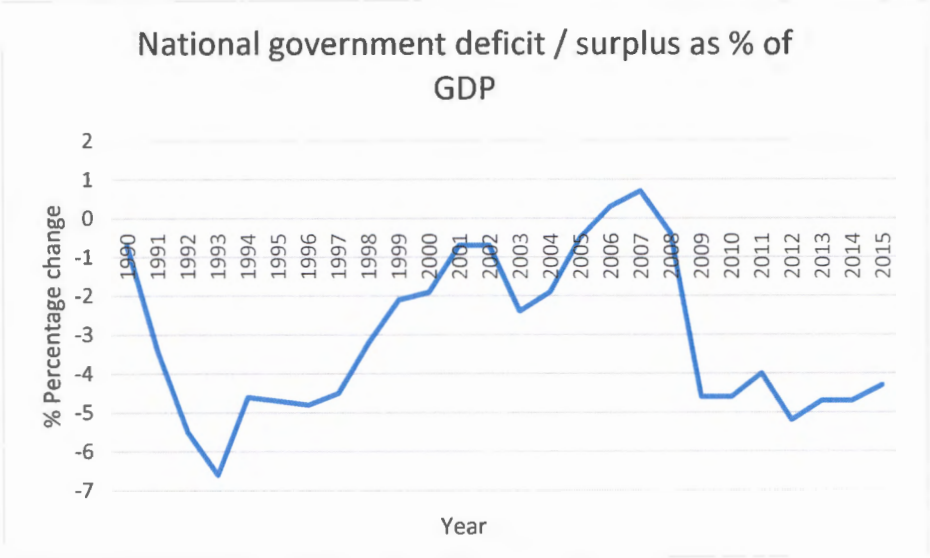
The South African government fundamentally expanded spending taking after the 2008-2009 economic recession to support economic activities and is currently reconstructing its financial space by topping spending with regards to development and growth. The South African

national spending plan was adjusted up to 2008 suggesting restricted need of acquiring financial assistance locally for national budget deficit financing purposes. Because of the 2008-2009 worldwide crises, the budget deficiencies have been recorded subsequent to 2009, bringing about noteworthy increments in the nation's domestic debt individually.

2.7 AN OVERVIEW OF SOUTH AFRICA'S BUDGET DEFICIT/SURPLUS

The government's budget is one framework that determines everything that has been discussed in this study thus far. The budget provides a basis in which the government can center its activities. Countries like South Africa tend to spend more than what they can actually afford, as asserted by Hamilton and Veigi (2008). It is for this reason that this study finds it necessary to analyse the trends of the South African budget with regards to deficits and surpluses.

Figure 2.10 South Africa budget deficits



Source: Own computation with data obtained from SARB (2016)

Figure 2.10 illustrates the budget deficits and surplus that occurred in South Africa between 1990 and 2015. Because of a viable debt management framework, the debt profile in South Africa remains sustainable yet high. The net debt is relied upon to reach 44 percent of GDP in 2017/18 as focused by the IMF (2016). Every year, most national governments produce a yearly spending plan that incorporates data on budget deficit. A deficit is seen as the distinction between receipts and costs because in most cases, there usually is a deficit, the government needs to compensate for it by issuing treasury bills and bonds, which permits the legislature to

gather money from regular or institutional investors, empowering the government to proceed with its spending on important projects.

According to the SADC bankers (2009), economic growth and reasonable fiscal administration have seen South Africa's financial plan deficit drop significantly from 5.1 percent of GDP in 1993/1994 to 0.5 percent in 2005/2006, which the second most minimal budget shortage in the nation's history, after reaching 0.1 percent in 1980. Moreover, as asserted by Madubeko (2010), the budget deficit levels in 1992 and 1993 were expanding and unsustainable. After 1995, subsequent to the underlying spending projects of the recently chosen government, shortage levels were seen to be near 5 percent. From 1997 to 2000, the deficit level declined consistently under the leadership of the GEAR strategy.

During the year 2000, the focus moved towards decreasing the expense of debt to limits, which are practically possible and attainable guaranteeing government's entrance to domestic and global monetary markets and differentiating subsidising instruments (Mabugu *et al.,* 2015). These goals keep on anchoring government's debt management technique today. It was only up to the 1990s that rising debt to GDP ratio made government more mindful of the expenses in overseeing public debt. During the year 2006/2007, South Africa experienced its first budget surplus or excess of 0.3 percent. Up until 2008, deficiencies kept on being unobtrusive; a slight surplus was observed in 2001, 2006 and 2007, which was all due to high growth rates and enhanced collection of tax.

Moreover, in 2008 a somewhat marginal shortage appeared, as the worldwide growth declined, due to the global crisis in 2008, domestic economic consequences followed as asserted by the Industrial Development Corporation (2013), which implied that the rate of debt to GDP had unavoidably expanded, as deficiencies were caused. The level of debt from the period after 2008/2009 and in 2012 kept on increasing throughout the following couple of years as deficits became evident, despite the fact that this level of expansion will only be moderate, of which government moved to critical shortfalls from the year 2009. During the year 2012 and 2013, the budget deficit was 4.2 percent of GDP and was anticipated that it would be 4.2 percent again for the financial year 2013/2014. The South African government expenditure was 28, 3 percent of GDP in 2012/2013, contrasted with 27.9 percent in 2011/2012. The government budget deficit ascended from 3.6 percent in 2011/2012 to 4 and 2 percent in 2012/2013.

Explanations behind this incorporate a lower than anticipated development in tax income and unfavorable increments in government spending on activities focusing on improving economic conditions and employment creation, all set against a background of domestic structural difficulties and an ailing worldwide economy. It is through a blend of treasury bills and both inflation-indexed bonds and fixed incomes that domestic borrowing remains the essential source of financing for the occurrence of a budget deficit. Moreover, government consumption was 32.5 percent of GDP in 2012/2013, which was an increase from 29.9 percent in the past financial year. It appears the expanded deficit is in relation to with the usage of counter-cyclical measures intended to boost economic development and growth.

2.8 CONCLUSION

Even though debt levels were seen to be lower during the period before 1994, this does not necessarily imply that during the pre-apartheid era, there were no problems related to debt. It is observed from the discussion provided that, debt levels significantly increased after the new elected government took over in 1994. However, the study does not put blame on the ANC, because the ANC had to re-establish and revamp South Africa in that the after-effects of apartheid needed to be dealt with, hence the debt levels started rising after 1994. The general trend seen in these discussions regarding both government debt and external debt was that similar patterns were identified at similar periods. For example, in 2008 when the economic recession hit, it was observed in both government and external debt that elevated levels of debt followed in 2009 after the recession period. Another period that was similar was 2010, where debt significantly rose for both government and external debt.

Moreover, the trends of economic growth in South Africa are somehow related with the debt levels in SA, as similar patterns are also evident in 2008 and 2010. Economic growth in South Africa has improved since 1994, with a negative growth only in 2008, which was in line with the increments seen in the debt levels of the country. The improvements in growth do not only indicate the monetary state of the economy, but also the standard of living of South African citizens. It is through the implementation of policies such as RDP, GEAR, JIPSA and EPWP, that the standard of living in South Africa has improved, jobs are created and people are able to acquire skills, leading to prosperity for individuals and for the South African economy. Growth is steadily improving and it is through the implementation of government projects, policies and frameworks that the economy will prosper.

The study saw it necessary to reflect on issues that also play a role in economic growth and debt, such as interest rate payments on debt, government revenue and expenditure and the budget deficit. These key issues were also contributors to debt and growth, as similar trends compared to debt and growth are identified in similar periods. This illustrates that when one thing happens, such as when there is a recession, the whole economy is affected; this includes the budget, interest rates, debt levels, expenditure and revenue of the government. South Africa has managed to achieve quiet a number of things that have helped it with regards to recovering from the effects of the apartheid era. The country is also a member of the Southern Customs Union, Common Monetary Area, African Union and the Southern African Development Community (SADC). South Africa dominates the African region economically; according to the UNDP African Outlook 7 (2014), South Africa represents 41 percent of all SADC exchange and around 63 percent of its consolidated GDP. South Africa is also a member of BRICS (Brazil, Russia, China, India and South Africa), which represents 25 percent of worldwide GDP and 40 percent of worldwide population.

CHAPTER 3: LITERATURE REVIEW

3.1 INTRODUCTION

The main aim of this chapter is to ensure that theories of growth and debt are reviewed in detail with regard to their current state and their origins. It, therefore, is evident through past papers that there exists theoretical and empirical literature, of which both will be reviewed in detail in this chapter. It is in this chapter that the literature review of debt and growth will be discussed and the key elements identified.

This chapter consists of three sections, which are organised in the following manner: Section 3.2 consists of the theoretical literature of economic growth; Section 3.3 is the theoretical literature of debt; Section 3.4 is the empirical literature review and Section 3.5 is the conclusion of the chapter.

3.2 THEORETICAL LITERATURE OF ECONOMIC GROWTH

3.2.1 The Harrod-Domar growth model

Harrod-Domars plan behind the growth model was to set up the rate of growth with regards to income, which will further result in the equilibrium of investments and savings as indicated by the study of Nafzinger (1997). Moreover, the variables utilised in Domars model incorporate capital accumulation and the proportion of expansion required with respect to output levels. This, therefore, leads to an increase in investments. It is noted that Domars model is somewhat in line with the Keynesian economic school of thought. Furthermore, the model also demonstrates growth because of the equilibrium amongst investments and savings. This is represented in the following manner: ΔK which indicates capital stock and $\Delta K / \Delta Y$. Moreover, the adjustment in output is seen as an after effect of progress in capital stock, which is represented by $\Delta Y = \Delta K$, where ΔY indicates the output. The adjustment in capital stock is because of investment, which is represented as $\Delta K = I$.

In order to figure out whether the real growth rate will bring about a circumstance where the required investment is equal to the expected level of savings, Harrod (1939) recognised three distinctive growth rates, namely natural growth rate (gn); real growth rate (g) and warranted growth rate (gw).

Moreover, the actual growth rate is illustrated as a proportion of saving, which is illustrated by (s) to the proportion of change in capital to the adjustment in output, which is represented by $\Delta K / \Delta Y$. This can be represented as follows:

$$g = s/c \quad \ldots\ldots (3.1)$$

By substituting the equation for (s) and (c) into equation 3.1, this gives

$$s/c = S/Y/(Y)/\Delta Y/Y,$$

which demonstrates the level of output development, when savings is equal to investments, (ie, S=I) and $\Delta Y / Y$ shows the development of output. As indicated by Harrod (1939), the warranted growth rate is the development rate that gives rise to investments, in such a way that leads to savings and investments reaching equilibrium, where capital stock is completely used. Therefore, the expected expenditure is equal to the output, which is represented by g=gw. This then gives the premise to financial investors to keep contributing, in the meantime boosting economic development and growth.

Moreover, Harrod (1939) made an investigation of two situations, the first situation is when the real growth rate is more noteworthy than the warranted rate, implying that when g>gw: $\Delta K / \Delta Y \geq I / \Delta Y$ and the second scenario is when the real growth rate is lower than warranted development rate, that is g<gw: $\Delta K / \Delta Y \leq I / \Delta Y$. In a circumstance where, as asserted by Mazenda (2012), the expected level of saving is not equivalent to the wanted level of investments, that is g≠gw, the output development rate will therefore transform into an inflationary or recessionary gap. In this case where g>gw, investment is insufficient, with regards to keeping up a consistent capital stock development. Accordingly, this leads to the rise in inflationary gaps. Furthermore, with expanded investments, the inflationary gaps become enlarged because of an expansion in the real output, which are a result of expanded interest for variable inputs.

In the last case, where g<gw, the expected investment surpasses the present capital stock growth rate. This leads to assets becoming immobile and investments becoming discouraged, which brings about a recessionary gap. Moreover, as asserted by Mazenda (2012), the noteworthiness of this disequilibrium is that it will become a disturbance. This is on the grounds that when g>gw, a motivating force to invest is started, while on the other hand, when

g is less than gw, a disincentive to invest will occur as a result. It was through working autonomously that Domar (1947) concurred with Harrods conclusion and results that when an economy moves towards the direction of a disequilibrium this will in itself cause a disturbance in the economy. Domar (1947) further brought up the fact that investments, while adding to total demand by means of the multiplier effect, additionally build up supply through its impact on growing the capacity of production. It is for this reason that Domar (1947) came up with the rate of investment that gives a premise for supply to be equivalent to the demand at a particular level. The equilibrium requires that:

$$\Delta Yd = \Delta Ys \quad \ldots\ldots (3.2)$$

Where $\Delta Yd = \Delta I / s$

Which suggests an adjustment in the level of investment, that is: $(\Delta I / s)$ causes an adjustment in the level of demand (Yd), which causes an adjustment in the level of supply (Ys) of which:

$$\Delta Y / s = I\partial \quad \ldots\ldots (3.3)$$

Where ∂, serves as a representation of capital stock profitability. In this manner, the investment rate $(\Delta I / I)$ should measure up to investment and capital stock profitability in order for equilibrium to take place. However, the Domar theory of economic growth did not ensure full employment, even within the sight of full use of capital stock, hence giving a response for Harrod natural growth rate. This was asserted by Thirwill (2003), who revealed that the actual growth rate cannot surpass the natural growth rate, which can be seen in occasions where all the dynamic labour force is utilised.

As asserted by Thirwall (2003), it is possible for the capital labour ratio of developing nations to change as they move towards utilising more labour in the production process as compared to more machinery; hence, the use of a labour intensive production, which can occur without any side effects to the levels of output. Unfortunately, the Harrod-Domar model failed with regards to providing a steady state growth, where the failure lead to the introduction of theories such as the endogenous and the neoclassical growth models. One of the most important aspects of this theory is that the Harrod-Domar model provides a clear understanding of issues that developing nations face, most especially with regards to the techniques used in production processes.

3.2.2 The neoclassical Solow growth model

Robert Solow and Trevor Swan produced the neoclassical growth model in the 1950s. The models basic idea is that the rate of development of GDP is expanded by a higher share of GDP which is directed to investments, diminished by a higher rate at which the physical capital stock devalues and expanded by an increasing growth in total factor productivity (TFP) and technology (Solow 1962). The model attempted to give a response for one of the immense puzzles of development economics that is why the rich nations are so rich and why the poor nations are so poor. Like numerous economic models, the Solow economic model is based on the following two presumptions, first, that technology is set to be exogenous in the long run and, secondly, nations will somehow try to produce and consume a product that is set to be homogenous (Ejigauyehu, 2013).

According to the study of Buranda and Wyoplosz (2001), technological change is considered as a noteworthy contributor to profitability, development and advancement. Moreover, increments in capital stock, which takes the type of physical or human capital, is additionally fit for expanding the productivity of labour. As asserted by Becker and Barro (1988), physical capital exudes from interest in real capital. Human capital includes investment in things such as education and training. The model is created taking into account the Cobb - Douglass production function given by the structure:

$$Y = F(K,L) = K^{a}L^{1-a} \quad \text{..... (3.4)}$$

Where:

Y represents output

K represents capital

L represents labour

From equation 3.4 above, a and $1-a$ are the representations of elasticity with regards to labour and capital respectively and a represents a number somewhere between zero and one. Expressed in numerical terms, the mathematical manipulation of equation 3.4 above will thus be written as:

$$Y = K^a \quad \text{.....} \quad (3.5)$$

In the event that the above production function is expressed with the related output per labourer, then:

$y = Y / L$ and capital per labourer, $k = K / L$, therefore, we will have this condition where : $y = k^a$

According to this condition, a nation that uses more capital per worker will deliver more output per labourer, as asserted by Jones (2002b), subject to the theory of diminishing returns to capital per labourer. The other essential condition from the Solow growth model is the capital accumulation condition communicated in the structure below:

$$K' = sY - dK \quad \text{.....} \quad (3.6)$$

Where each of the following represents:

Ḱ represents change in capital stock

sY represents net investment

dK represents depreciation, with respect to the production process and with mathematical control, Solow infers the capital accumulation condition in per worker terms, that is illustrated below:

$$k' = sy - (n + d)k \quad \text{.....} \quad (3.7)$$

According to the above condition, the adjustment in capital per worker is a component of investment for each labourer, depreciation per worker and furthermore population growth. From these three variables, only investment per labourer is related positively with the change observed in capital per worker.

3.2.2.1 The Solow growth model with regards to technology

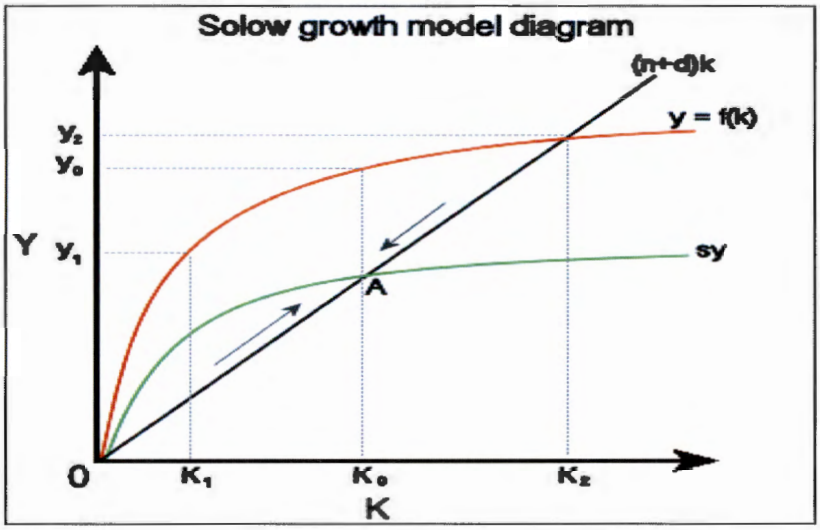
Solow incorporated a new coefficient called labour augmenting or Harrod-neutral and named it A, to capture the impact of technological change on the general production capacity, which means that the new equation will be represented in the following manner:

$$Y = F(K, AL) = K_a(AL)_{1-a} \quad \text{..... (3.8)}$$

In order to appreciate the sustained economic development and growth in per capita income as asserted by Ejigauyehu (2013), there ought to be technological progress. This technological advancement happens when A expands after some time. The study of Charles (2001) further indicates that a unit of work is more gainful when a higher level of technology is achieved.

The Solow diagram and the production capacity

Figure 3.1: Solow production curve



Source: Ejigauyehu (2013)

The Solow model outline can be drawn utilising the two key conditions as far as output per labourer and capital per worker is concerned (Ejigauyehu, 2013). These conditions can be represented in the following manner:

$$y = k_a \quad \text{..... (3.9)}$$

$$k' = sy - (n+d)k \quad \text{..... (3.10)}$$

The Solow diagram and production function comprise of three curves as asserted by Ejigauyehu (2013), the first curve is a representation of $y = k$ with regards to this production function. The second curve is a representation of the investment per individual curve, where the curve clearly seems to take the same shape as the production function curve, indicated by sy and illustrated by the variable(s). The third curve represented by the equation $(n+d)k$, which is the aggregate value of depreciation per labourer, which is dk and the population growth which is represented by nk, where both variables will diminish the measure of capital per individual in the economy. By no fortuitous event, the contrast between the investment per individual curve and the third curve is the adjustment in the measure of capital per labourer.

3.2.2.2 The Solow growth model and change in investment rate

According to a study by Ejigauyehu (2013), on the off chance that the investment rate increments in an economy is at its steady state, the (sy) curve will move upwards and the production curve likewise moves up. Moreover, after this, the economy will reach an increased and new steady state of capital per worker. If a situation arises, where the contrast between the two curves is positive, the resulting change will also be positive and the economy will expand its capital per worker and capital development occurs. When this per labourer change is zero, yet the real capital stock (k) is developing due to the population growth, it is said that only capital widening is happening.

Moreover, as asserted by Charles (2001), the steady state point is the time when the adjustment in capital per worker is zero, this occurs when the investments rate, represented by (sy) is equal to $(n+d)k$. The related steady state amount of capital per labourer and steady state amount of output per worker can be communicated in the following ways:

$$k* = (s/n+d)^{1/(1-a)} \quad \text{..... (3.11)}$$

$$y* = (s/n+d)^{a/(1-a)} \quad \text{..... (3.12)}$$

Where:

$k*$ Represents steady state amount of capital per labourer

$y*$ Represents steady state amount of output per labourer

Taking into account the above condition Solow reasons that by keeping all things constant, nations that have a higher investment and savings rate get to be wealthier on the grounds that they can collect an expansive measure of capital per labourer and this will result in those nations being able to create more output per worker. However, on the other hand, as asserted by Charles (2002), nations that show a high population growth rate will have a tendency to be poorer.

3.2.3 The new (endogenous) growth theory

As asserted by Mazenda (2012), the new endogenous growth hypothesis covers the gap identified with regards to the neoclassical development hypothesis, which accepts that technological change is exogenously decided in clarifying long-run economic development and growth. This has brought about inability to clarify contrasts in technologies across different nations. These innovative contrasts clarify why a few nations are rich and why others are poor. It is in this manner that, the new growth hypothesis gives a model where technology is endogenously decided. The thoughts are utilised to make capital assets in monopoly market structure, which permits the researchers to procure profits from their endeavours. As asserted by Romer (1993b), the sector that produces the final goods utilises them as variable inputs.

New thoughts or information changes technologies in the production process, as indicated by Jones (1998a). These mechanical changes make production inputs more profitable. Moreover, the hypothesis confronts three noteworthy suggestions, namely technological change is integral to the era of long-run development, secondly improvements with regards to technology are primarily impacted by deliberate global activities of operators who react to market incentives and, finally the financial matters of thoughts is distinctive in that the expense of production is brought about just once and the ides can be utilised again and again without pulling in further expenses. With respect to the new endogenous hypothesis, the characteristic of price taking cannot be entertained because of the uprising of monopolistic rivalry as indicated by Mazenda (2012).

This is included in the rule of non-competition and non-excludability of technological change. At this point Romer (1990a) asserts that when an asset such as knowledge is non-rival, it implies that its utilisation by one individual does not block another individual from consuming it. Moreover, non-rivalry holds noteworthy ramifications for the growth hypothesis as indicated by the study of Pack (1994). Non-rival assets, for example a street light which is a public good and its consumption limitation is zero, which simply means that a consumer can consume this good as much as they want, without diminishing the availability of the good to be consumed by someone else and can be utilised at the same time and same place. Furthermore, rival asserts, for example human capital, have a restricted life range/span where, in the event of death, the man's knowledge vanishes from the economic scene with this man when he dies.

This simply means that non-rival goods need not be duplicated as indicated by Mazenda (2012). As asserted by Romer (1990a), this means that inputs in the production procedure ought to combine rival and non-rival assets in order to encounter expanding returns to scale. Moreover, Romer (1990a) notes that the quantity of researchers, analysis and scholars must rise, in order to increase the long run financial development and growth in the model. This also applies to the population growth rate. Furthermore, this indicates that the rising population is unified in such a way that technical abilities can be utilised for advancement forms. In such a manner, Mazenda (2012) asserts that the model is advantageous to developed nations; however, developing nations can take in a lesson or two from this result in their journey to reducing and eliminating poverty.

3.2.4 Determinants of economic growth

The most essential aspect of every nation is having a sufficient monetary system, which is followed by the reasonable execution of financial measures, which are satisfactory for a given period in time. According to Abbas (2005), economic growth is defined as an increase in the aggregate yield of goods and services that are produced within the borders of that particular country. Recognisable growth occurs at a point where individuals take assets and revamp them in ways that are more profitable. In theoretical terms, Matiti (2013) elaborates that investigating the impact of basic financial variables on the monetary development and improvement of a nation depends on the essential macroeconomic connection that speaks to a consumption-based methodology for computing GDP.

Matiti (2013) asserts that the major determinants of growth and development in an economy incorporate macroeconomic variables, adequacy with regards to the nation's human capital, demographic elements, investment levels, political components, FDI and openness to trading in the international market. The study, therefore, sees it necessary to provide a brief discussion on the determinants of economic growth in such a way that will provide better understanding of the factors that have a substantial impact on the growth rates of a country. The basic key components of economic growth are discussed as follows;

3.2.4.1 The nation's openness to trade

Indicated as a major determinant for growth, Sachs and Warner (1995) identify a nation's openness to trade as determinant of growth which has been utilised broadly as a part of the financial development and growth literature. The strong and positive connection amongst openness and growth is led by the sound theoretical purposes. It is through a number of channels,that openness to trade as indicated by Edwards (1998) influences economic growth, for example the transfer of technology, expanding scale economies, exploitation of comparative advantage and exposure to competition.

3.2.4.2 The nation's institutional structure

As illustrated by Rodrik (1990), another vital source of growth is set to be the institutional structure. As indicted by Rodrick (2000), there are five key elements that are important to note, with regards to the institutional framework, namely administration institutions, establishments of conflict management, organisations of macro-economic stabilisation and foundations for social protection, which apply direct impact on financial development, as well as influence different determinants of development, for example investment, human capital, economic growth forms, physical capital and technical changes.

3.2.4.3 Foreign direct investment

It is through the primary source of technology exchange and economic activity, as asserted by Hermes and Lensink (2000), that FDI portrays a pivotal part of internationalising economic movement. It is for this reason that FDI plays a major role, of which this can be observed in numerous endogenous growth hypotheses. Lensink and Morrissey (2000) confirm that by observation of numerous literature with regards to growth and FDI, the empirical literature

findings has given a pretty much reliable and consistent idea and some discoveries providing that a critical positive relationship between growth and FDI exists.

3.2.4.4 Investment

The key determinant, according to Levine & Renelt (1992), of economic growth is set to be investment and both the neoclassical and endogenous growth models distinguished this. With respect to the neoclassical model, investment has a noticeable effect on the short-term period, whereas, the endogenous growth theory indicates that the impact of investments is noticeable over the long term. Moreover, Podrecca & Carmeci (2001) note that the significance attached to investments indicated by the neoclassical and endogenous theories has prompted a gigantic measure of experimental studies, which seek to scrutinize the relationship amongst investment and economic growth on a long- or short-term basis.

3.2.4.5 Economic policies and macroeconomic conditions

The other key role of economic growth and development, as asserted by Barro and Sala-i-Martin (1995), is the economy's economic policy and macroeconomic conditions because a nation's economic policy and its macroeconomic conditions can set the structure within which financial growth and development happens. Moreover, monetary strategies can have an impact on a few parts of an economy, through investment, improving the political and legal organisations, infrastructure and human capital. Furthermore, a number of macroeconomic components that have an impact on growth have been recognised in the literature; however, extensive consideration had been set on taxation rates, inflation, budget deficit and the fiscal policy.

3.2.4.6 Human capital

Human capital alludes mainly to a worker's expertise and acquiring of skills through training and education (Matiti, 2013). The study of Pritchett (2001) asserts that a number of studies have measured the nature of human capital through the utilisation of proxies identified with education, such as scientific skills, mathematical tests and school enrolment rates. As asserted by Krueger & Lindhal (2001), human capital is yet another important indicator of growth, as illustrated in a few endogenous growth models and, additionally, one of the key augmentations of the neoclassical development model.

3.2.4.7 The nation's political environment

During the recent years, various analysts have tried to quantify the nature of the political environment utilising variables, for example political administrations, political instability and civil freedom. Moreover, a researcher, Brunetti (1997), recognised four classes of applicable political variables, which are as follows: government stability, the subjective view of legislative issues, democracy and political violence. Moreover, another key determinant of an economy's development and growth, as asserted by Matiti (2013), is the political condition of that particular country. The work of Lipset (1959) evaluates the connection between political elements and monetary development, where he notes that his findings prove how financial advancement influences the political administration of a country.

It is through the above discussion that the factors influencing economic growth are taken into consideration with regards to drawing up conclusions about which key factors have an influence on growth. As most studies have indicated, economic growth can be either negative or positive. According to Du Plessis & Smit (2008), when the economy is negative, it is said that the economy is shrinking/contracting due to the fact that is associated with a downswing in economic activities, hence economic depression and recession. This also indicates that for an economy to be either negative or positive, the factors mentioned above that affect growth could also be the major drivers of such an outcome in a nation.

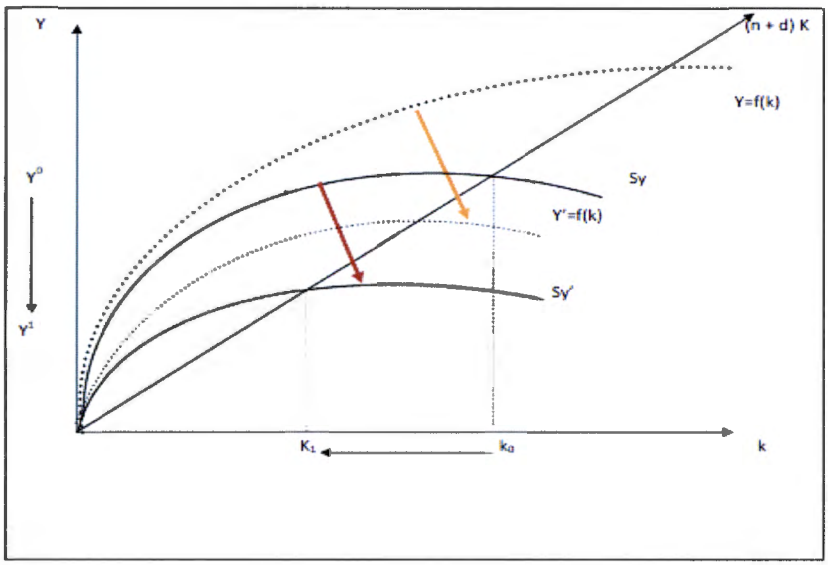
3.3 THEORETICAL LITERATURE OF DEBT

3.3.1 Solow growth model and external debt

As asserted by Ejigauyehu (2013), there exists no well-published theory that gives light on the relationship between Solow's growth model and external debt. In any case, some research on external debt has utilised the Solow growth model as a base to research its effect on financial development and economic growth. It was observed that in the theoretical part of the Solow model, the model is based on a shut/closed economy, of which capital and labour are utilised as ways to develop productivity. Under this circumstance, the ramifications of foreign debt on growth can be seen utilising its impacts on public saving of which this will thus be utilised as investment in that particular closed economy.

It is imperative that, before the study begins, to try to understand the phenomenon of Solow and its effects on debt and growth, it is thus important to view the single effects of debt crowding out and debt overhang and how they affect the Solow model. As indicated by the debt overhang theory, it is implied that efforts of the government to try and pay the debt that has accumulated, includes the government increasing tax rates with regards to the private sector. This is done as a method for exchanging assets to people in the public sector. This will minimize private sector investments and more government public spending on infrastructure decreases such as electricity supply, road development and telecom, as the accessible asset are utilised to pay the debt of the nation. Subsequently, the nation's private and public investment, that is the aggregate investment, will diminish. Therefore, as asserted by Ejigauyehu (2013), this will move both the investment and production function curves with regards to the Solow model downwards.

Figure 3.2: External debt and Solow production curve



Source: Ejigauyehu (2013)

Then again, when nations are compelled to pay some portion of their external debt, it is found that in most cases they have utilised their incomes that they received from exports and at times exchange, including foreign exchange and foreign aid assets to benefit their expected debt, whereby in this situation, the debt crowding out effect is in play. Those nations that exchange incomes from exports, which can be utilised as a part of an investment towards the debt

instalments, will debilitate the degree of public investments. This will lead to a diminished economic growth and will move both the production function and investment curves in the Solow growth model facing in a descending direction. By examining the theoretical aspects, the specific and consolidated impact of debt overhang and debt crowding out will influence investments and economic growth in a negative way instead of in a positive way. Furthermore, by following the Solow growth model, a negative impact will be expected.

3.3.2 Public debt theory – Classical economist theory

A study by Varughese (1999) asserts that the predominant perspectives of the classical economists concerning public debt were as follows: First, the government's debt account pulls back assets from profitable private employment. Secondly, the continuous borrowing by the government makes future financing more troublesome by expanding the extent of the budget, which must go for altered charges and by expanding the measure of assessments, which must be paid to fund the interest costs on the debt. The third point asserts that budget shortages are less agonising than current taxes (unbalanced spending plans, which extend government movement and welcome untrustworthy legislative action). Lastly, public debt prompts currency devaluation. The last point illustrates that because loan money is expensive, public costs financed, therefore, as asserted by Kwoba and Kosimbei (2015), should be paid for twice, in the sense that, firstly the government will have to pay the interest charges related to the acquired money, and also again the government has to pay for the actual debt.

As indicated by the study of Kowba and Kosimebei (2015), public debt is known to be an essential macroeconomic pointer for any nation. With regards to the growth of a nation, a portion of the possible antagonistic impacts include higher inflation, higher long-term loan costs, more prominent instability, defencelessness to emergencies and increased taxes. Moreover, this has aggravated different perspectives concerning the perspectives of researchers on the effect of public debt on economic growth. Adam Smith, Ricardo and Malthus who are classic economists, saw public debt as advances by the government that pulls back assets from beneficial private employment. Moreover, Adam Smith (1779) notes that the state was inefficient; it took acquired assets for ineffective purposes from private capitalist and denied them of capital, which was required for advancing productivity and exchange amongst different states (Varughese, 1999). Furthermore, Smith contended that legislatures ought not to run budget deficits in light of the fact that these lead to the build-up of public

debt with catastrophic impacts for the country, regardless of the possibility that all of it was owed locally (Tsoulfidis, 2011).

3.3.3 Keynesian theory and debt

With respect to the general hypothesis of interest, money and employment, Keynes (1935) came out with the hypothetical results in relation to the structure of economic thought, of which these results were however different. This gave the premise to the recent hypothesis of public debt, which discovers expression in functional finance as asserted by Varughese (1999). Varughese (1999) further indicates that, the level of national debt does not make a difference at all, even though large interest instalments are paid, they do not constitute any weight upon society. Moreover, the economy is regarded as a single unit concerning the no burden doctrine and in this manner holds that private debt is not the same as government debt in being external as asserted by Kwoba & Kosimbei (2015). In the case of national domestic debt, which is owed by the state to its natives of the same state, there are then no external creditors and therefore, that particular capital can be seen as being owed to themselves.

Moreover, it additionally overlooks the refinement between economic order in view of a command economy and private ventures. Therefore, the no burden proposal additionally depends on certain focal points of public borrowing. It is through debt creation that the government can tap investment fund streams, put the assets consequently raised to profitable use and achieve an expansion in national income. The expanded stream of income encourages the instalment of taxes to benefit the debt service. When the season of unemployment strikes, increments in public debt are a contributing factor to current capital development. Therefore, it advances the development of increased institutionalised sources of reserve funds like securities exchanges, banks and insurance agencies. Furthermore, according to Varughese (1999), it allows the population of a nation to enhance their standard of life through which it controls consumption, supports investment funds and advances capital formation.

3.3.4 Post Keynesian theories on public debt

A negative relationship is identified by the theoretical literature, with respect to the relationship between public debt and growth. However, especially in a neoclassical setting, growth models expanded with public agents issuing debt to back-up consumption or capital products tend to display a negative relationship between public debt and economic growth.

Refining the work and contributions of Buchanan (1958) and Meade (1958), Modigliani (1961) contended that government debt is a burden placed on the shoulders of the coming generation, which comes as a decreased stream of pay from a lower supply of private capital. Refining commitments by Buchanan (1958) and Meade (1958), Modigliani (1961), through the Modigliani burden postulation, embraced the total investment strategy with a perspective to disconnect the monetary impacts of national debt. Accordingly, Modigliani (1961) contended that national debt is a burden for the nation's future generation, which comes as a diminished stream of wages from a lower supply of private capital. Notwithstanding the immediate crowding out impact, Modigliani further indicated the effect on long haul financing costs.

In light of the recommendations that public debt creation constitutes any exchange of the essential basic burden to the future era, the similarity, according to Alvey (2011), amongst private and public debt is misleading, and there is an imperative qualification between internal and external debt. A study by Buchanan (1958) attempted to set up how that the essential burden of public debt is transferred to the future generation of that particular nation, the relationship between public debt and private debt basically is right and that foreign debt and local debt fundamentally are proportional. Furthermore, Buchanan (1958) stated that instalment of taxes are seen as somewhat of a burden. Because debt finance puts off the levy of taxes, it clearly moves the burden to the future generation of the country.

3.3.5 Debt overhang theory

The rise in debt defaults by developing nations during 1980 leads to further investigations of debt overhang. A paper by Paul Krugman (1994b) examined whether debt forgiveness or debt financing are ideal, on account of a defaulting developing nations. Other previous studies and literature that Krugman (1994b) takes into account, is to a great extent concentrated on the issue on the side of a creditor's point of view. The meaning of debt overhang differs with Krugman characterising debt overhang as "the presence of existing inherited debt adequately substantial that lenders don't anticipate that with certainty will be completely reimbursed" (Krugman, 1988a). Moreover, the other definition is of the IMF that highlights the mutilated benefits of an indebted person. Accordingly to IMF (1989), the debt overhang theory does not depict a circumstance where foreign debt is only huge, yet one in which the presence of external debt destroys the relevant margins considered for investment and production choices.

Myers (1977) initially hypothesised the theory behind debt overhang and his hypothesis was based on business valuation in corporate finance and the impacts of debt financing. The author's study explores why organisations do not fund their activities with the greatest debt despite the fact that there plainly exists a tax advantage because of the deductibility of loan costs. He further explains that the reason for this is associated with high measures of debt, which distorts the potential outcomes for organisations to settle on ideal future investment choices. Moreover, Myers (1977) asserts that debt prompts a particular type of conduct where, positive net present values of projects, do not get embraced because of the way in which parts of future profits from business ventures goes to banks and other creditors as guaranteed instalments.

The theory of Myers (1977) consolidated the issue into a basic case concerning a partnership/business with present and future resources, which yielded present and future money streams. From being indebted, a portion of the future cash flows, therefore, will be exchanged to the creditor as guaranteed instalments and would make disincentive impacts for the corporation's investment arrangement. Hypothetically, as asserted by Sundell and Lemdal (2011), a nation cannot be viewed as an organisation even though there is a will to expand the economy. In order for the nation to have the most elevated conceivable utilisation over different points in time, the nation can encourage this by expanding the yield output of the nation because in this way, if the level of output rises, the benefit of being part of that country will automatically also increase. By utilising the Keynesian theory and formulas for output, an expansion in output (Y) would prompt a comparing increment on the other side of the Keynesian formula:

$$Y = C + I + G \quad \text{.....} \quad (3.13)$$

Furthermore, this study would argue that a nation output (Y) can be seen to depend on a particular value of the current assets (YA), which can be characterised by the formula as asserted by (Sundell & Lemdal, 2011):

$$Y = Y_a + Y_g \quad \text{.....} \quad (3.14)$$

The estimation of the nation output (Y) relies upon the estimation of current resources (Y_a) and the countries choice to make future investment plans (Y_g). Krugman (1988a) contends

that there is a critical contrast between the present and future investments of companies and nations, and the difference between income streams. An organisation, therefore, will have a likelihood distribution of streams of future incomes and from these profits, debt can be serviced. However, a nation has a comparative likelihood conveyance, in such a way that the distinction shows up in light of the fact that enterprises can completely submit their income streams to their debt servicing, while a nation can just utilise a small amount of their national income for debt service. The livelihood of the residents and other mandatory duties must outweigh everything else to keep the nation stable.

This drives this study into having an idea on how debt is managed amongst partnerships and nations. Nobody truly has a lawful preview over a nation so a default could go by without expropriation for the borrowers. In the event that an organisation defaults, they go into Chapter 11 method, which is bankruptcy, where lenders are paid back however much as could reasonably be expected of the debt owed to them. However, a sovereign nation cannot be constrained into servicing their debt or be sold. There are negative impacts connected with defaulting for nations. Trust is an imperative part of requiring any form of credit, which indicates that, should a nation default, the nation may find it difficult to acquire credit in the future, as their access to credit will be limited due to them having defaulted. It could likewise discover its assets seized in other international countries.

3.3.6 The crowding out effect of debt

3.3.6.1 History of crowding out effect

Before the cutting-edge worldwide economy came to be, Sichula (2012) asserts that the crowding out impact has been examined for over hundred years. With a lot of nations' riches being held inside the borders of the country, expanded tax assessment for public ventures and other public spending could straightforwardly be connected to a decrease in the limit for private spending, as less capital was accessible. Then again, macroeconomic theories such as Chartalism and post-Keynesianism assert that in a modern economy working essentially beneath limit, government borrowing can really expand the demand by enhancing employment levels in that particular country, in this way empowering private spending. In spite of the fact that the crowding out effect is a term that is viewed as general, it is frequently utilised as part of reference to the holding of private spending in places where the government spending is relatively high.

3.3.6.2 The crowding out effect in healthy vs a depressed economy

This decrease in capital undertakings, in part, can counterbalance advantages achieved through the government's borrowing, for example those of economic stimulus, however, this is just likely when the economy is at a particular level with regards to productivity in the economy. In this regard, government stimulus is hypothetically more compelling when the economy is beneath the limit. An economic downswing may even happen, lessening the revenues that the government gathers through taxes and impelling the government's need to acquire additional capital, which can hypothetically prompt an endless cycle of crowding out and borrowing.

3.3.6.3 Crowding out and social welfare

The crowding out effect may likewise happen in view of social welfare, far-fetched as this may appear to be. This occurs when governments increase taxes to subsidise the presentation of new welfare programs or the development of existing ones. With higher expenses, people and organisations are left with less optional salary to spend, particularly on charitable donations toward social welfare or different causes that the government is financing additionally.

With regards to the above mentioned, public sector expenditure for social welfare may lessen private sector provision to social welfare, in this way diminishing the net impact of the government's spending on those same causes. In certain instances, governments may solely tax the rich for social welfare projects that are aimed at benefiting poor people. Taxing the rich on the basis of helping the needy is known famously as the Robin Hood impact. Furthermore, the creation or development of public health care insurance such as Medicaid can have the impact of promoting those secured by private insurance to change to the public alternative option, which is another compatible type of crowding out.

In certain cases, government may bring about crowding out effects by going into regions that beforehand were secured solely by private industry, which can incorporate things like business grants and government investments. Customarily, funding firms put resources into new organisations to help them develop and to build the company's capital. With a decreased ability to choose their optimal organisations, funding firms actually have a lessened ability to make fruitful ventures.

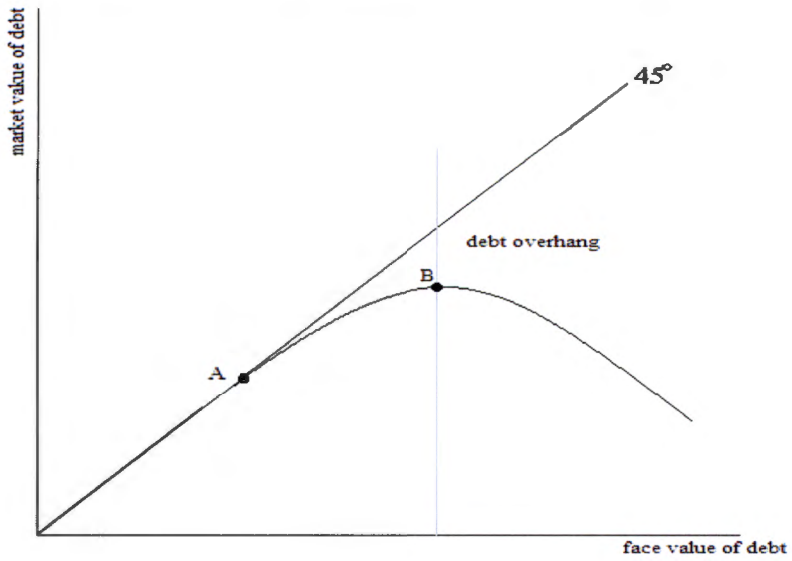
3.3.7 The debt Laffer curve

As indicated by Bachvarova (2008), there are a few reasons why the debt Laffer curve could possibly be helpful. The first reason is that the Laffer curve can be utilised, on a fundamental level, to decide when unilateral debt forgiveness may be advantageous. Moreover, it can be utilised as a major aspect of business sector debt reduction plans as recommended by Krugman (1988a). An inversion in the adequacy of high debt burden recommended by the shape of the Laffer curve was utilised by the World Bank and the IMF, when they propelled the HIPC activity in the mid-1990s that were meant to decrease the debt burden of low-pay nations to manageable levels.

The debt Laffer curve represents a circumstance in which a nation is obtaining capital excessively in a form of borrowing. This indicates that, that particular nation surpasses a specific endogenous level identified as the debt threshold, which could bring about misfortunes to the nation. This can however be related to the large extent of debt burden and the failure of the nation to invest a portion of its revenue, in light of servicing the debt. In a situation such as this, debt forgiveness is suggested, which will come at a cost linked to the lenders/creditors. Moreover, reducing the face value of debt will not prompt a decrease in the normal estimation of the debt reimbursements, since it will diminish the risk of defaulting.

The debt Laffer curve demonstrates that as a nations' debt builds up, after a specific level, which leads to an inconsistency between the face estimation of the debt and the optional business sector cost of the debt. This then demonstrates that there is inefficiencies with regards to the fact that the normal estimation of the reimbursements of debt is lower than the true estimation of the claims against the nation. Moreover, Sachs (1989) asserts that debt rescheduling is an insufficient reaction to circumstances in which will lead to the need for debt to be forgiven. He further contemplated that in such cases, both the lenders and the debtors knew about the need of inevitable debt forgiveness. When Sachs (1989) composed his paper, debt rescheduling as opposed to debt forgiveness was a rule authoritatively examined. Moreover, Sachs built up a hypothetical model named Debt Overhang for Developing Nations, which demonstrated that debt forgiveness could not retain the present market value of the debt instruments, additionally, in certainty will expand the estimation of the normal reimbursements of commitments from indebted nations. In order to evaluate Sachs theory, the debt Laffer curve is illustrated in Figure 3.3 and a detailed discussion follows.

Figure 3.3 The debt Laffer curve



Source: Bachvarova (2008)

As illustrated in Figure 3.3, the underling basic rationale of the debt Laffer curve is examined, calling attention to the fact that the relationship between the face estimation and the market value of debt is coordinated up to a specific point. At the point when the face estimation of debt ascends past this point, as asserted by Bachvarova (2008), the market value starts to rise gradually. Moreover, according to Pattillo *et al.* (2002), the purpose behind this dissimilarity is as a nation continues to accumulate more debt, the nation will find it harder to fund that debt, on account of the expanded debt servicing obligations. In this way, as asserted by Pattillo *et al.* (2002), the accumulated debt then prompts a general decline in the market value of debt and, therefore, the marginal profit on debt, which can be observed on the right hand side of point A begins to decline, even though the absolute market value of debt is as yet still expanding. Moreover, in an event that the level of debt keeps on expanding past a specific threshold point, the total increment on the face value cannot make up for the peripheral decline in the market value and the nation is said to experience the ill effects of a debt overhang problem (Bachvarova, 2008).

Furthermore, at the point when a nation has a level of debt at face value that is connected with a reduced market face value, only two potential outcomes can occur, as asserted by Bachvarova (2008). Either that particular nation is on the left half of point B illustrated in Figure 3.2, or that nation is on the right half of point B. In this case, point B is the most

extreme market value of debt that a nation can accomplish. In the event that the level of debt relates to a point on the debt Laffer curve, which is between the points A and B, the nation is said to be on the right half of the Laffer curve, therefore, implying the correct one. In a circumstance like this, debt forgiveness will not bring about an expansion in the market value of the debt. Assuming, a nation has a level of debt that relates to a point on the curve on point B, the nation is said to be on the wrong side of the debt Laffer curve, that is, the nation experiences the problem of debt overhang. For this particular situation, debt forgiveness will lessen the face estimation of a nation's debt, but also, this will prompt an increase in the market value of the nation's debt.

3.4 EMPIRICAL LITERATURE REVIEW

In the first section of this chapter, the theoretical literature was observed with regards to the relationship between debt and economic growth in South Africa. Moreover, a number of studies have evaluated the relationship that exists between debt and growth. However, different conclusions have been obtained because studies made use of different techniques and approaches such as panel data, time series, Granger causality and ADRL in order to investigate the relationship of debt and growth.

It is very important to review the findings of other studies though they do not all agree with each other. As observed from the empirical evidence, researchers seem to be divided into three categories. There are those that research the topic with regards to developed countries (Al-Refai, 2015; Kumar & Woo, 2010; Mencinger *et al.,* 2014; Muhdi & Sasaki, 2009). The second category of researchers include those who use sub-Saharan countries as their focal point (Christensen, 2005; Makau, 2008; Obademi, 2012; Panizza, 2008; Sarno, 2001). Thirdly, other scholars make use of HIPC and developing countries (Checherita & Rother, 2010; Clements *et al*., 2003; Pattillo *et al.*, 2002; Pattillo *et al.,* 2004); all the findings will be revealed below. Because South Africa is classified under the category of developing, it is important to review the literature that is associated with South Africa in relation to debt and economic growth.

3.4.1 Evidence from developed and developing countries

The relationship between government debt and economic growth has been a subject of exploration with various discoveries. For example, the study by Mencinger *et al.* (2014),

examined the effect of developing government debt on financial development in the European Union (EU) from 1980 to 2010. The study utilised panel data estimation based on a summed up economic growth model which was augmented with a debt variable, to record the impact of debt-to-GDP proportion on the real growth rate of GDP. The discoveries showed a measurably noteworthy significant effect of government debt proportions on yearly GDP per capita growth rates. Moreover, these discoveries were in accordance with the findings of other researchers such as Kumar and Woo (2010), who additionally discovered a nonlinear relationship between the underlying level of government debt and subsequent GDP development. His study was conducted making use of panel data of 38 progressed and developing nations for a period traversing around four decades from 1970 to 2010. Kumar and Woo (2010) noticed that an extensive public debt is liable to affect capital accumulation and additionally efficiency, which possibly also has an effect on the nation's growth.

A study by Geiger (1990) utilised the ARDL procedure to investigate and explore the effect of external debt stocks and economic growth for nine South American nations from 1974 to 1986 and concluded that there exists a huge negative effect of debt stocks on economic growth. Moreover, Borensztein (1990) expressed that debt overhang is a circumstance, where the advantages from the profits of extra investments are lower because of the reimbursement of debt commitments. Furthermore, Sachs (1989a) asserted that debt burden is a noteworthy reason for bringing down the financial development of HICs.

Moreover, making use of the OLS estimation, Muhdi and Sasaki (2009), likewise investigated the relationship between foreign and domestic debt in Indonesia, making use of data from 1991 to 2000. Their study demonstrated the beneficial outcomes of the rising pattern of foreign debt on both investment and growth. Therefore, a positive outcome was observed. Checherita and Rother (2010) explored the normal effect of government debt on GDP per capita for 12 Euro region nations from 1970 to 2009. The study indicated non-direct negative effect of government debt on economic growth.

A study by Singh (1999) investigated the relationship between public debt and economic growth in India, making use of the co-integration method and Granger causality test from 1959 to 1995. The study upheld the Ricardian equivalence hypothesis between public debt and growth in India. Moreover, a study by Sheikh *et al.* (2010) concentrated on the effects of public debt on economic development, where they watched the effect of public debt servicing

on economic growth in Pakistan by applying the OLS strategy from 1972 to 2009. The study demonstrated that the negative effect of public debt servicing on economic growth and development is grounded more than the positive effect of local debt on economic growth

In a general point of view, Cordela *et al.* (2005) utilised the OLS method from a period 1970 to 2001, in a panel of 79 developing nations, where he reasons that there is a minimal negative relationship amongst debt and growth at sustainable levels of debt, which does not occur once those levels are low. Nations with great legislation and solid establishments face debt overhang when debt ascends above 15-30 percent of the GDP, yet the minimal impact of debt on growth gets to be unimportant above 70-80 percent. However, in nations with ineffective, inefficient policies and poor organisations, debt overhang and the cut off points of inefficiency appear to be lower.

Abbas and Christensen (2007) executed generalised strategies of approaches, in a panel of 40 developing nations, from 1975 to 2004. Their outcomes demonstrate that domestic debt positively affects economic growth before surpassing a limit of 35 percent of aggregate deposits by the banks. Furthermore, they contend that past this limit, credit accessibility for domestic investments lessens and, accordingly, unfavourably influences economic growth. Making use of panel data from 1970 to 2010, Babu *et al.* (2014) concentrated on the impact of foreign debt on economic growth in the East African Community (EAC). The study was established based on the Solow development model augmented for debt. The outcomes recommended that external debt had a negative critical impact on per capita GDP growth rate in the EAC. The study presumed that it was necessary to decrease the level of foreign debt in order to empower expanded economic growth and development among the EAC.

Moreover, a study by Pattillo *et al.* (2002) considered the results of external debt on economic growth, where the study made use of a Laffer-type relationship, where they observed a nonlinear relationship between foreign debt levels and economic growth. A huge panel dataset from 1969 to 1998 was utilised, which consisted on 93 developing nations. The outcomes of this study showed that the significant channel through which large amounts of external debt discourages growth is through diminished effectiveness of investors, as opposed to the level of investment. The study presumed that elevated debt burden tampers with economic growth resulting from declining efficiency with regards to investments and not on account of the volume of efficiency in investments.

Furthermore, Lau *et al.* (2010) examined different sorts of debts and their effect on the financial development in Malaysia, utilising cointegration test, and inferred that monetary development is influenced adversely by debt in the long run. Kemal (2001) clarifies the concept of debt accumulation and its suggestions for development and poverty reduction in Pakistan. The study demonstrates that debt servicing and accumulation influences the poor unfavourably. The discoveries of the study represent that despite the fact that the burden of debt as a rate of GDP of Pakistan surpasses that of all South Asian nations, it is not significantly high enough for the debt to be written off or discounted. This implies that the Pakistan economy has the ability to service their debts.

Being one of the first to research the impact the vulnerability of debt servicing instalments, Oks and Van Wijnbergen (1995) concluded that in Mexico, the inconsistencies with regards to debt servicing payments influences private investments negatively and, subsequently, economic growth. As demonstrated by Agenor and Monteil (1995), an expansion in the further debt services may urge the legislative force to embrace inflationary arrangements to actualise certain changes.

Kumar and Woo (2010) concentrated on the effect of high public debt levels on the long-run economic growth for a set of developed and developing economies from 1970 to 2007. Their experimental results propose a reverse relationship between the initial debt levels and consequent growth, 10 percent increment in the underlying debt-to-GDP ratio is connected with a decreased yearly real per capita GDP growth of around 0.2 percent every year, with the effect being to some degree less in advanced economies.

Depetris & Kraay (2005), Presbitero (2010) and Johansson (2010) evaluated direct estimations of the effect of debt reduction on economic growth. The findings of these studies indicate that debt reduction was not as compelling in connection with its impacts on economic growth. To be sure, Depetris and Kraay (2005) built up a database on the net present estimation of the debt servicing accomplished by 62 nations that are classified under low-income nations from 1989-2003. They found no critical impact of this variable on investments and economic growth. This outcome is affirmed by Presbitero (2010), which utilises the same philosophy, yet over a more extended period up to 2007. Johansson (2010) utilises a growth regression and uses the present estimations of reducing debt created by Depetris and Kraay

(2005). The results obtained by Johansson (2010) demonstrate no constructive outcome of decreasing debt on economic growth, using 118 developing nations from 1989-2004.

3.4.2 Evidence from sub-Saharan African countries

Economic theory argues that a substantial stock of debt makes an environment in an economy unstable. As indicated by this perspective, according to Clement *et al.* (2003), there are worries on what sort of approaches and activities the government may undertake in order to service its debt obligation. Such arrangements may incorporate expansions in tax rates, which may bring down the confidence of investors and force the investors to either move their investment portfolios to a less indebted nation, or hold their investment plans. Furthermore, investment choices, under an air of vulnerability, seem to diminish the level of confidence and expectations with regards to financing long term basic tasks (Moss & Chaiang, 2003).

Moreover, a study by Christensen (2005) utilised a cross-country review of the role of domestic debt markets in SSA, taking into account data sets of 27 SSA nations during 1980 to 2000 and discovered that domestic markets in these nations, for the most part, are quite small. They also are short term and regularly have a smaller investor base. Furthermore, the study discovered that domestic loan cost that is interest rates instalments, present a critical pressure to the budget allowance with huge crowding out impacts. Studies by Afxentiou & Serlitis (1996) and Amoateng *et al.* (1996) found that there is a negative causal connection between foreign debt and GDP development for middle-income African nations. With respect to low-income African nations, they found a positive and unidirectional causality between GDP growth and external debt servicing.

According to the findings of Iyoha (1999), the rise in public debt levels negatively influences economic growth. He further asserts that the impact of debt overhang and debt crowding out on financial development of sub-Saharan nation is noteworthy. This implies that the increased stock of foreign debt and the over the top burden of debt administration depressingly affected interest in these nations, which had a direct impact in decreasing the rate of economic growth and development. As discussed by Sachs (1989), the idea of debt overhang leads to a negative impact on economic growth in those nations. Krugman (1988a) shares the idea of Sachs (1989) and holds the same perspective that external debt can affect the levels of investments negatively and, therefore, on economic growth through debt overhang.

According to a study by Fosu (1996), the level of debt adversely influences economic growth in SSA by diminishing profitability levels. Moreover, the study evaluates the effects of external debt on economic growth during the mid-1980s in SSA, when the debt levels were overwhelmingly high. Utilising data acquired from the World Bank from 1980-1990, identifying with 35 nations in SSA, Fosu (1996) takes note that the net debt is adverse to economic growth for given levels of production factors and for the given levels of growth, where these nations would have been more prominent without external debt.

A study by Ayadi and Ayadi (2008) concentrated on the effect of external debt alongside its servicing costs in Nigeria, utilising time series data from 1970 to 2007. Ayadi and Ayadi (2008), in his study, utilised the OLS and GLS strategies for estimation and inferred that the debt and its servicing negatively affects economic growth. In an alternate point of view, Ogunmuyiwa (2011) looks at how external debt influences the development in developing nations, especially in Nigeria, utilising data from 1970 to 2007 and different econometric techniques, in particular the Granger causality test, Johansen co-intergration tests and the augmented Dickey Fuller test (ADF), amongst others. The outcomes demonstrate that the causality between external debt and economic development in Nigeria is indistinct.

The study of Emran and Farazi (2009) investigates 60 developing nations from 1975-2006 and conclude that one US dollar increment in domestic debt results in a 1.34 US dollar diminishment in private sector credit. Moreover, their outcomes are in line with the findings of Christensen (2005), who finds that a 1 percent increment in domestic debt diminishes private sector debt by 0.15 percent in an example of 27 SSA nations over the period 1980-2000. This proof is in accordance with that of Onyeiwu (2012) who studied the Nigerian economy for the period 1994–2008, and Durawall and Erlandisson (2005) for the period 1995-2005 in Malawi. Moreover, the study of Makau (2008) investigated the relationship between external debt servicing and economic growth development in Kenya. The author's study utilised one development equation model evaluated utilising ordinary slightest square (OLS) strategy from the time period 1970 to 2003. The discoveries of the study demonstrate that external debt in Kenya, for the most part, is official, of which a greater extent is from multilateral sources.

The study by Pattillo *et al.* (2003) applied a growth accounting system, evaluating 61 developing nations in SSA, Asia, Latin America and the Middle East over the period 1969 to

1998. Their outcomes propose that multiplying debt diminishes by almost as little as 1 percent in terms of in total factor productivity and per capita growth. In addition, the policy environment of that particular country also affects the debt growth relationship. Fosu (1999), in his exact study of 35 SSA nations, additionally discovers support for the debt overhang theory. Conversely, Hansen (2001) finds that in a panel of 54 creating nations, of which 15 are set to be HIPCS, the consideration of three extra illustrative variables such as inflation, openness and budget balance prompts dismissal of any measurably huge negative impact of foreign debt on growth.

Sarno (2001) contends that a linear model is by all accounts excessively prohibitive, making it impossible to sufficiently capture the asymmetries that may exist between the debt to GDP and GDP growth recommends the utilisation of nonlinear debt maintainability in the evaluated relationship amongst economic growth and debt. The objective of the study is to look at the conceivable nonlinear relationship between government debt and economic growth in South Africa from 1980-2014. South Africa is a fascinating contextual investigation since it has encountered elevated amounts of debt since the new democratic government took over in 1994. Ayadi and Ayadi (2008) affirmed the negative effect of debt and it's overhauling necessities on development for Nigeria and South Africa.

Furthermore, Pattillo *et al.* (2004) approximated that the basic quality at which external debt harmfully affected growth is between 35 to 40 percent of GDP, with regards to the countries that were studied. A study by Al-Refai (2015), embraced a Cobb Douglous production function, to investigate the impact of debt and growth in Jordon utilising data from 1990-2013. The assessment of his study demonstrated that gross fixed capital formation and domestic debt had a positive and critical relationship on economic growth while external debt, labour and long term external debt had a negative and insignificant effect on economic growth and development.

Moreover, a study by Panizza and Presbitero (2012) distinguish a particular channel through which abnormal amounts of public debt influence economic growth in the following manner; a vigorously indebted government may embrace prohibitive approaches to combine its funds, or such measures discourage economic movement. Likewise, the execution of severity measures in an economy going through a recession expands the hypnotic impacts of it and therefore eventually leads to the rising levels of public debt. At that point, without a doubt, it

is proven that high public debt diminishes development. Therefore, the exact findings on relationship between external debt and economic growth demonstrate that at a specific limit, external debt adversely influences economic growth somehow.

Furthermore, Obademi (2012) likewise broke down the effect of government debt on economic growth in Nigeria. Making use of an expanded Cobb Douglas model and later on a dynamic version, the practical relationship was evaluated with the utilisation of the cointegration strategy in order to consider the long-run effect of debt variables on economic growth in Nigeria. The discoveries demonstrated that the impact of debt on economic growth was negative and entirely huge over the long run while in the short run the effect of acquire funds and coefficient of budget deficit was certain. The study presumed that while in the short-run the effect of obtained assets on the Nigerian economy was certain, in other words positive, the effect of debt over the long haul discouraged monetary development because of incomplete debt administration.

Nautet and Van Meensel (2011) hypothetically recognise three primary channels through which an increment in the public debt can adversely influence economic growth in the long haul. An expansion in the public debt will diminish the volume of net reserve funds at national level and in this manner a higher loan fee. This prompts a decrease in investments and a slowed down growth of capital stock. Moreover, any decrease in capital accumulation results in lower advancements and a decrease in labour. A study by Reinhart and Rogoff (2010) evaluated the development of public debt and the real rate of long run development for a specimen of 40 nations over the period traversing the most recent two centuries. The examination of their information uncovers a powerless relationship between government debt and long haul growth for debt levels below the limit of 90 percent of GDP. Furthermore, when the debt levels pass 90 percent, the median growth rate reduces by 1 percent and diminishes further.

3.5 CONCLUSION

In this chapter, a full review of the different kinds of schools of thought were discussed and investigated with regards to debt and growth. The study evaluated and examined theories of economic growth, which illustrated that there are three schools of thought to take into account, namely the Harrod Damor growth model, the neo classical growth model and the new endogenous growth model. It is in this manner that these studies are slightly different from

each other in the sense that the Harrod Damor model, indicated by the study of Nafziger (1997), is focused more on growth with respect to income. Moreover, the neoclassical Solow model, which was developed in the early 1950s, was based on technology in the short-run, investments, physical capital stock and total factor productivity with respect the growth.

Furthermore, on the other hand, the endogenous growth theory was focused mainly on bridging the gap that was identified by the neoclassical hypothesis concerning technological change in the long run and economic growth. It is these gaps that appear in the literature that lead to further gaps being identified by other researchers, therefore, providing more theoretical basis such as the writings of Romer (1990a) and Puck (1994). Moreover, throughout the transition of the literature since the early 1950, the literature also indicated that there are various factors that play a role in the growth level of a nation and that those factors, amongst many, as identified by Ndambiri *et al.* (2012), incorporate FDI and openness to trade amongst many. Theoretical grounding was identified with respect to debt, where it is identified in the study that there exist numerous theories of debt, namely the debt overhang theory, debt crowding out theory, the public debt theory and the Keynesian theory amongst others.

Studies such as those of Gerger (1990) indicate that the empirical literature suggests that there exists a negative relationship between growth and debt. Even though numerous studies have come to this conclusion, a number of studies suggest otherwise, such as studies of Muhdi and Sasaki (2009), who found that a positive relationship exists between debt and growth. Moreover, the negative relationship identified between debt and growth in the empirical literature holds for developing, developed and sub-Saharan countries. However, looking at the empirical side of things, there is a limited amount of time series studies conducted on South Africa, with respect to debt. It is for this reason that the study seeks to bridge this gap in order to identify and investigate the relationship between debt and growth in South Africa.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION

In this chapter, the methodology utilised to empirically investigate and analyse the relationship between debt and growth will be explained. The chapter, however, consists of four sections, which can be identified as follows: In the first section, the specification of the model will be illustrated and explained. Section 2 consists of the definitions of the variables utilised in this study with regards to the data sources, the data utilised and a full description of the variables will be provided. Section 3 provides the estimation techniques that are to be utilised and, lastly, Section 4 will be the conclusion of the chapter.

4.2 SPECIFICATION OF THE MODEL

The study utilised the expanded model of the production function initially applied by Cunningham (1993) in order to explore the impact of debt on economic growth in South Africa. This is on the grounds that, the debt burden has vital ramifications for labour and capital productivity (Akram, 2011). Moreover, Akram (2011) further asserts that, a country that convey a noteworthy debt burden are required to spend part of its assets in order to be able to service its debt obligation, of which this will have critical ramifications on decisions related to labour employment in the production function. Thus, a production function taking into account debt can be composed in the accompanying structure:

$$Y = A(K, L, Debt) \quad \text{.....} \quad (4.1)$$

The equation above is presented in a manner in which Y, K, A, L and debt serve as a measure of capital stock, public debt, GDP, the labour force and other variables that are set to be constant. Moreover, this leads to the assumptions that input elasticities of output are steady and specialised change is neutral. According to the study of Presbitero (2005), it is important to keep in mind the importance of investment. Therefore, it is ideal to unravel the analysis of public debt and growth in a two-stage relationship, in such a way that firstly, the immediate connections between public debt and growth are investigated, and then the relationship between public debt and investment is explored. Therefore, the growth condition with respect to the reduced vector form can be composed in the following manner:

$$y_t = \alpha + \beta_{yt-1} + \sum_{j=1}^{k} \delta x_{tj} + \sum_{m=1}^{p} \pi Debt_{tm} + e_t \text{ ....}$$

(4.2)

Where:

y_t is the representation of log GDP per capita, at a time of t, y_{t-1} is a lagged estimation of GDP, x_{tj} serves as a vector for control factors, x_{tm} and represents the vector of different public debt indicators. Lastly e_t is a representation of the error term. This model, as asserted by Akram (2011), can be extended further to identify the impacts of debt on investment, because investment is the essential channel through which debt influences economic growth and development. By introducing investment, the model will be composed in the following manner:

$$Inv = \alpha + \sum_{j-1}^{k} \delta_{xtj} + \sum_{m=1}^{p} \pi Debt_{tm} + e_t \text{ ....} \quad (4.3)$$

Where:

inv_t represents the log of investment at a time t , x_{tj} is a vector of control factors, x_{tm} serves as the vector of different public debt indicators and e_t represents the traditional error term. In order for the study to explore the effect of debt on economic growth in South Africa, the macroeconomic model is specified taking after the studies of Ada *et al.* (2016) and Chongo (2013), which investigate the linear relationship between growth and the debt burden indicators. This study will incorporate a few modifications, following numerous variables that are proposed by the theory of debt and growth, this study proposes the following functional form:

$GDP_t = f(GD_t, FD_t, EXP_t, INV_t)$

Where:

GDP_t = Real *per capita* gross domestic product

GD_t = Total government debt

FD_t = Total foreign debt

EXP_t = Gross national expenditure

INV_t = Investment

In order to parameterise the long run econometric model into a log linear form, from the functional form above, the log linear form can be postulated in the following manner:

$$GDP_t = \beta_0 + \beta_1 \ln GD_t + \beta_2 \ln ED_t + \beta_3 \ln EXP_t + \beta_4 INV_t + e_t \quad \text{..... (4.4)}$$

Where:

$\beta 1, \beta 2, \beta 3, \beta, 4$ denotes the coefficients to be estimated in this study

$L.n$ denotes the natural logarithm

e_t denotes the error term

This model specification, however, is tentative in such a way that the framework will provide other researchers and scholars a framework to build on following the variables that are proposed from the literature. It is also imperative that in the specified model, the variables are presented in their natural logarithms. This is because the data obtained is from different sources and not of the same unit of measure, therefore this is done to present all variables in the same unit of measure.

Only variables whose unit of measure is not in percentages will be logged. Furthermore, this model is an improvement of the model that is purposed by Ada *et al.* (2016). Accordingly, the study then applied a national income identity model augmented with debt and fiscal variables were utilised. The study of Omotoye *et al.* (2006) asserts that when a nation's external debt ratio to GDP and debt service stock to GDP is higher, this ultimately will lead to a situation whereby the debt burden of that economy becomes greater.

4.3 DATA SOURCES

The study makes use of time series analysis in order to investigate the relationship between debt and growth. The study also makes use of secondary data from a time period of 1970 to

2015, which is obtained from various accredited data providers such as the South African Reserve Bank, World Development Indicators and Quantec. Furthermore, the data utilised in this study is presented as follows: (KBP4108J) foreign debt, (KBP4113J) total loan debt of national government, (NY-GDP.MKTP.KD.ZG) annual GDP growth, (NE.DAB.TOTL.ZS) gross national expenditure and (NE.GDI.FTOTL.ZS) gross fixed capital formation.

4.4 DEFINITION OF VARIABLES

Fredderke and Romm (2006) and Moolman *et al.* (2006) point out that the use of certain variables lies behind the ability of those variables to be more significant and commonly used compared to other variables. It is in this section that the variables utilised in this study will be explained in detail. The study makes use of proxies that have been utilised in the literature by other scholars and researchers in order to evaluate and investigate the relationship between debt and growth. By using these proxies, the study will be able to compare its results with the existing literature and its findings.

4.4.1 Gross domestic product

Gross domestic product (GDP) is one of the essential indicators that is utilised to gauge the strength and health of a nation's economy. It also serves as a representative of the monetary estimation of all finished goods and services created inside a nation's border during a particular period in time. Numerous methods of calculating growth have been used by various studies in the literature. Some studies make use of real GDP, GNP, per capita GDP, etcetera. This study will utilise annual GDP growth as a proxy for economic growth in South Africa. This is adapted from the studies of Matiti (2013), Atique and Malik (2012) and Ada *et al.* (2016).

4.4.2 Investment

An investment can be defined as an asset that can be utilised or is purchased with the end goal of creating additional income for the investor. However, in an economic sense, an investment incorporates the purchasing of goods, securities, land or even property with the main goal of earning profit. In the literature, numerous studies use different proxies for investments such as: gross capital formation, investment output ratio, gross domestic investment and gross fixed capital formation. As a proxy for investment, the study makes use of gross capital formation as

a percentage of GDP. This follows the preposition of Akram (2011), Ali and Mustafa (2015) and (Šimić and Muštra, 2012).

4.4.3 Government debt

Government debt is referred to as the debt that is owed by the central government; a central government with its own particular currency can pay for its spending by making money again; however, government debt is created to balance the deficiency when spending surpasses income. The study makes use of total loan debt of the national government as a proxy for government debt. This is adapted from the study of Naraidoo and Raputsoane (2013).

4.4.4 Foreign debt

Foreign debt, as asserted by the study of Mazenda (2012), refers to the aggregate loan debt of the national government. This is set to be attributed to the foreign marketable debt. Mazenda (2012) further asserts that an expansion in debt will bring about a decline in investments and economic growth. Furthermore, Obwona (2001) notes that this is due to subsidising that is intended to boost investments, which will then be utilised as part of adjusting the debt obligation, which, therefore, would lead to a decline in growth in the long run. The study makes use of total foreign debt of national government as a proxy for foreign debt and the use of this proxy is adapted from the study of Mazenda (2012).

4.4.5 Expenditure

National expenditure refers to the summation of government, private and gross capital expenditure that is said to be in the form of an investment. The study of Ada *et al.* (2016), asserts that this variable has been demonstrated to affect economic growth and development in countries positively. The study makes use of gross national expenditure as a percentage of growth as a proxy for government expenditure. This is adapted from Ada *et al.* (2016) and Ndambiri *et al.* (2012).

4.5 VARIABLE DESCRIPTION AND EXPECTED SIGNS SUMMARY

Description	Variable	Abbreviation	Logs	Unit of measure	Expected sign	Source
GDP Growth (annual %)	Gross domestic product	GDP	LGDP	%	+ (positive)	World Development Indicators (2016)
Total loan debt of national government	Government debt	GD	LDG	R Millions	-/+ (negative/ positive)	South African Reserve Bank (2016)
Total loan debt of national government: Total foreign debt	Foreign debt	FD	LFD	R Millions	-/+ (negative/ positive)	South African Reserve bank (2016)
Gross national expenditure (annual % growth)	Government expenditure	EX	LEX	%	+ (positive)	World Development Indicators (2016)
Gross capital formation (annual % growth)	Investment	INV	LINV	%	+ (positive)	World Development Indicators (2016)

Source: Authors own table

4.6 ESTIMATION TECHNIQUES

A number of techniques have been developed throughout the past decades in order to test the relationship between two or more variables with the use of cointegration techniques. The basic approaches that are utilised to test for cointegration include the Engle and Granger (1987) two-step and the Johansen (1988a, 1991b) maximum likelihood cointegration test. These tests, amongst many such as the residual-based procedure by Shin (1994) and the variable addition approach by Park (1990), require that the variables utilised should be integrated at the order

I(0) or I(1). Pesaran (1999) asserts that it is due to variables having to be either integrated at I(0) or at I(1) that numerous pre-testing procedures needed to be conducted, which ultimately brought about more uncertainty in testing for the long run relationship between variables. It is for this reason that Pesaran *et al.* (1999) proposed a new approach, called auto regressive lag (ARDL), to test the existence of long run relationships amongst variables, irrespective of whether these variables are integrated at I(0), I(1) or jointly integrated at I(0) and I(1) respectively.

The ARDL approach is thought to be fitting for analysing the fundamental relationship between debt and growth in South Africa. Even though Pesaran *et al.* (2001) developed the ARDL approach recently, the approach has additionally been progressively utilised as part of the empirical research. Shahbaz *et al.* (2012) notes that the ARDL bounds test is said to have a competitive advantage, making it superior compared to other cointegration procedures. A study by Odhiambo (2008) notes that the ARDL technique gives unbiased estimates with regards to the long run model and legitimate t-statistics, even when a portion of the regressors are endogenous. Originally introduced by Pesaran and Shin (1999) and further extended by Pesaran *et al.* (2001), the ARDL model is said to demonstrate and manage single cointegration (Dritsakis, 2011). Additionally, the ARDL-bounds approach does not force restrictive assumptions that the variables under review must be of the same order, as many other approaches do, such as the Johansen approach. The beauty of the ARDL methodology lies in the fact that it allows variables at their optimum speed to adjust back to equilibrium.

The bounds test procedure, as asserted by Frimpong and Oteng-Abayie (2006), is said to be a very simple and effective technique to utilise, as compared to other multivariate cointegration approaches such as that of Johansen and Juselius (1990). Furthermore, the ARDL approach permits the cointegration relationship to be evaluated by OLS once the lag order of the model is distinguished. Moreover, this approach likewise can also accommodate a large number of variables rather than the vector autoregressive (VAR), or the vector error correction model (VECM), while the error correction term can likewise be acquired by linear transformation, as asserted by Jardoon *et al.* (2015).

One of the basic limitations that researchers and scholars come across lies in dealing with problems related to acquiring time series data for a large sample size. This problem can be solved with making use of the ARDL procedure as the bounds test can be applied on a small

sample size (Jardoon *et al.*, 2015). The most favourable thing about the ARDL bounds test is that the predefined ARDL model, with the ideal lag structure, considers the deferred impacts of the relationship between the variables utilised. By making use of standard criterion, for example Akaike Information Criterion (AIC) and the Schwarts Information Criterion (SIC), the ideal number of lags is chosen for the best ARDL model. However, the model will crash when the presence of I(2) variables is detected (Frimpong & Oteng-Abayie, 2006).

4.6.1 Stationary tests

In order to determine the order of integration of the variables utilised in the study, stationarity tests are employed. Therefore, this study will make use of both the Phillips-Peron (PP) and the augmented Dickey Fuller (ADF) stationary tests. Stationarity tests are conducted in order to determine that no variables are integrated at order I(2), as this, according to Brooks (2002), will lead to spurious regression whereby the standard t-ratios will not take after the t-distribution and the F-statistic will not follow the f–distribution. Furthermore, despite the fact that the trending variables are completely random and unrelated, this will lead to the likelihood of high r-squared values and significant t-ratios. It is also important to conduct the stationary test as the ARDL procedure is based on the assumption that all variables utilised are integrated at either order I(0), I(1) or both. It is for this reason that unit root tests ought to be conducted on every one of the variables before testing for cointegration and assessing the parameters.

The study of Madubeko (2010) asserts that a stationary series has a mean and a variance that is set to be constant for every given timeframe. Gujarati (2003) also notes that the estimation of the covariance between the two time periods depends on the distance between the two periods in question, not on the time the covariance is calculated. If a series is said to be non-stationary, it must be differenced d times before it becomes stationary, then the series is integrated at the order of d. The letter d is a representation of the order of integration, hence will be denoted as I(d). The order of integration alludes to the number of differencing operations it takes to make the variable stationary. The order of integration can also provide the number of unit roots of a series. Madubeko (2010) notes that a series that is integrated at I(0) is said to be stationary, while a series that is integrated at I(1) contains a single unit root.

4.6.1.1 Augmented Dicky Fuller test (ADF)

The stationarity of a time series can be tested straightforwardly with the use of a unit root test as asserted by (Gujarati, 2003). Dougherty (2011) notes that, the ADF is the most commonly used test for stationarity. However both the Dickey Fuller (DF) and the Augmented Dickey-Fuller (ADF) tests can test for stationarity. Moreover, the objective of the DF test is to test the following null hypothesis and indicate whether $\omega = 0$.

$$y = \beta_2 t + \omega y_{t-1} + v_t \quad \text{.......... (4.5)}$$

Where:

$H0$: The series has a unit root $(\omega = 0)$

$H1$: The series has no unit root $(\omega < 0)$

Models under the above theories have three cases, as asserted by Mabudeko (2010). First, when a random walk test is conducted with respect to a stationary autoregressive procedure identified to be integrated of order one (AR(1)), secondly, when a random walk test is conducted against a stationary (AR(1)), which consists of a drift and, lastly, when the random walk test is conducted against the stationary (AR(1)), which consists of a time and drift trend.

As indicated by Dougherty (2011), due to its simplicity and its robustness, the Augmented Dickey Fuller test utilises the following condition:

$$\Delta y_t = \beta_1 + \beta_2 t + \omega y_{t-1} + v_t \quad \text{.......... (4.6)}$$

In such a way that yt represents the time series, Δ is a representation of a first difference operator, t represents a linear pattern and lastly v_t serves as a representation of the disturbance term. Moreover, what is most important about the disturbance term is that, it should fulfil the suppositions of constant error variance, normality and independent disturbance terms. Moreover, the outcomes in view of the Dickey Fuller test will be one-sided if the disturbance terms are not autonomous in condition 4.6 stated above (Takaendesa, 2006). Moreover, Madubeko (2010) asserts that, a restriction of the Dickey Fuller is that, it does not assess the possibility of autocorrelation within the disturbance term. Therefore, as a result, the ADF test can be utilised and as this test augments the test utilising m lags of the dependent variable. By

including a differenced term on the right-hand side with regards to the Dickey Fuller condition stated in 4.6 the test redresses for high order serial correlation. Thus as indicated by Asteriou and Hall (2011), the ADF utilises the accompanying conduction:

$$\Delta Y_t = a_0 + \gamma Y_{t-1} + a_2 t + \sum_{i=}^{p} \beta_i \Delta Y_{t-i} + \mu_t \quad \text{..... (4.7)}$$

Where a_0 indicates the constant term, γ indicates the coefficient of the lagged variable Y_{t-1}, a_2 indicates the trend coefficient t and μ_t indicates the disturbance term. Indicating that the non-stationary procedure can either be I (1), I (2)….I (p), the order of integration can reach the p_{th} lagged difference term. Therefore, the model is estimated with a_2 (trend) and a_0 (intercept), then with trend or no intercept, followed by intercept and no trend, and lastly without either trend or intercept. Furthermore, the ADF value is then compared with the critical value, whereby if the calculated ADF value is greater than the critical value, the null hypothesis of; the series has a unit root will be rejected, therefore indicating that the variables are stationary.

4.6.1.2 Phillips Perron tests (PP)

Identified as a generalisation of the ADF test, the Phillips Peron (1988) test takes into account mild presumption concerning the distribution of the errors. As indicated by Asteriou and Hall (2011), the state of consistent variances and no correlation of error terms must always hold true. A better alternative to the ADF test is said to be the PP test as asserted by Phillips and Peron (1988). Asteriou and Hall (2011) note that this test accordingly rearranges the ADF test through minimising the assumptions related to the error terms. The test regression can be identified as the AR (1) process as asserted by Asteriou and Hall (2011), which is presented in the manner below:

$$\Delta y_{t-1} = \alpha_0 + y Y_{t-1} + e_t \quad \text{..... (4.8)}$$

From the AR(1) regression, the PP test makes an adjustment with regards to the t-statistic of the coefficient in order to replace the serial correlation in e_t , while the ADF test amends for higher order serial correlation by including lagged differenced terms seen on the right hand side. Furthermore, the PP test manages higher serial correlation, contrasting to the way in which the ADF test does. The ADF test and the PP test both test the null hypothesis that a unit root is

present, in other words, the series is not stationary. Both tests are undertaken with a trend, trend and intercept and none. Furthermore, if the probability value is higher than 5 percent level of significance, the study will dismiss the null hypothesis that states that the series has a unit root.

4.6.2 Cointegration test: autoregressive distributed lag (ARDL) bounds test

The ARDL bounds test will be conducted in this study, following a number of procedures and tests such as the model specification, model selection, diagnostics and stability tests, f-statistic testing making use of the Wald test and the error correction model will be conducted in order to investigate the relationship between debt and growth. The steps listed will be discussed in detail below.

4.6.2.1 Model specification

The empirical model utilised in this study to investigate the relationship between debt and economic growth in South Africa is based on the study of Dritsakis (2011). The ARDL representation of the long run equation as follows:

$$\Delta GDP_t = \beta_0 + \sum_{i=0}^{n} \beta_{1i} \Delta GDP_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta LGD_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta LFD_{t-i} + \sum_{i=0}^{n} \beta_{4i} \Delta LEXP_{t-i} + \sum_{i=0}^{n} \beta_{5i} \Delta LINV +$$

$$\alpha_1 GDP_{t-1} + \alpha_2 LGD_{t-1} + \alpha_3 LFD_{t-1} + \alpha_4 LEXP_{t-1} + \alpha_5 LINV_{t-1} + e_t$$

..... (4.9)

In such a way that:

The difference operator is represented by Δ and $i = 0$ indicates that the number of lags begins at zero. The constant coefficient is indicated by β_0, where the white noise disturbance term is represented by e_t. The parameters $(\beta_1 - \beta_5)$ illustrate the short run association of the model used in this study. Furthermore, the standard ARDL model concerning the long run dynamics is represented by $(\alpha_1 - \alpha_5)$.

4.6.2.2 Long run joint significance F-statistic test and bounds testing

In order to investigate the presence of long run relationship between the variables, the bounds test developed by Pesaran *et al.* (2001) methodology is utilised. The bound testing technique

depends on the F-test. The F-test is a test for the hypothesis of the fact that there exists no cointegration among the variables, against the hypothesis that the presence of cointegration exists as noted in the studies of Akinboade *et al.* (2008) and Dritsakis (2011). This hypothesis can be denoted as follows:

$$Ho: \beta 1 = \beta 2 = \beta 3 = \beta 4 = 0 \quad \text{..... (4.10)}$$

which indicates no presence of cointegration amongst the variables utilised.

$$H1: \beta 1 \neq \beta 2 \neq \beta 3 \neq \beta 4 \neq 0 \quad \text{..... (4.11)}$$

which indicates the presence of cointegration amongst the variables utilised.

The ARDL bounds test depends of the Wald-test, which is the F- statistic as in the studies of Ada *et al.* (2012), and Frimpong and Oteng-Abayie (2006). Furthermore, the asymptotic distribution of the Wald test is non-standard concerning the null hypothesis theory of no cointegration amongst the variables. As indicated by Pesaran *et al.* (2001), Narayan (2005) and Iglesi-Lotz and Pouris (2012), two basic values are given for the cointegration test. Pesaran *et al.* (2001) indicate that the lower bound critical values assume that every one of the variables are integrated of order I(0) implying that there is no cointegration relationship between the variables under examination. The upper bound critical values assume that all the variables are integrated of order $I(1)$, thereby implying that there is cointegration amongst the variables (Ozturk & Acaravci, 2010).

At the point when the computed f-statistic is said to be greater than the critical value of the upper bound, this will imply that the null hypothesis H_0 will be rejected as it indicates that the variables are indeed cointegrated (Dritsakis, 2011). Furthermore, on the off chance that the f-statistic is lower than the critical value of the lower bound, this will imply that the null hypothesis cannot be rejected, in other words it is accepted, indicating that there is no cointegration detected amongst the variables. Pesaran *et al.* (2001) also indicates that at a point when the computed f-statistic lies between the upper and lower bound it will imply that the results are uncertain and unreliable; hence, the findings are inconclusive.

4.6.2.3 Model selection: Akaike Information Criterion and Schwartz Information Criterion

After assurance of the presence of cointegration amongst the variables, the following step in the ARDL approach is to determine the long run coefficients. In order to discover the ideal optimal length for the long run coefficients, the Schwartz (1978) and the Akaike (1974) is utilised. The number of lags utilised by various potential models, in which the model would be identified, differs throughout studies. Utilising the ARDL approach, potential models will be estimated making use of various lag structures, namely lag 1, 2, 3, 4, 5 and 6. Moreover, the study will utilise the AIC and the SIC in order to identify the true model that contains the ideal optimum number of lags. This is also confirmed by the study of Iglesi-Lotz and Pouris (2013), where they assert that a suitable lag length in the specified first differenced regression is selected with the utilisation of the AIC and the SIC. It is also confirmed by the study of Cheung and Lai (1993) that the utilisation of the standard SIC and AIC is valuable with regards to selecting a fitting number of lags.

The AIC determines the measure of data that is lost when one model is utilised to approximate a particular model (Posada & Buckely, 2004). The AIC is the more supportive model when it comes to the selection procedure of lags. Hence, the study of Posada and Buckley (2004) and Jones (2011) asserts that the model with a low AIC is favoured; therefore, the stage to choose the best model is to pick a model for which the AIC is the most minimal. Furthermore, even though the derivation of the AIC is formed on data theory, the study of Posada and Buckely (2004) further asserts that the AIC is to a great degree straightforward and effective. Even though the AIC is said to pick the correct lags, the study of Cheung and Lai (1993) notes that the SIC appears to somewhat beat the AIC concerning its performance more especially when utilised in a small sample size, such as in this study.

4.6.2.4 Error correction model

According to Best (2008), the error correction model is an arrangement of time series models that approximate the rate at which the dependent variable will come back to equilibrium after an impact created by an adjustment in the independent variables, subsequently valuable in the estimation of short run dynamics. The fundamental structure of an error correction model following the studies of Ada *et al.* (2016) and Ditsakis (2011) is in the following manner:

$$\Delta GDP_t = \beta_0 + \sum_{i=0}^{n} \beta_{1i} \Delta GDP_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta GD_{t-i} \sum_{i=0}^{n} \beta_{3i} \Delta FD_{t-i} + \sum_{i=0}^{n} \mathrm{B}_{4i} \Delta EXP_{t-i} + \sum_{i=0}^{n} \beta_{5i} \Delta INV$$

$$+ \lambda ECT_{t-i} + e_t \quad \text{..... (4.12)}$$

This model, however, incorporates only the short run variables and the lagged residual. EC indicates the component of error correction model; it quantifies the rate at which the procedure, which deviates from equilibrium, is corrected. A high R-squared and a small standard error are said to be an indication of a good error correction model as noted by Best (2008). Moreover, in order to capture the speed of adjustment of the short run dynamics to long run equilibrium, the error correction model incorporates the error correction term. Morley (2006) confirms that long run causality amongst the variables is indicated by a significant error correction term.

Furthermore, according to Ozturk and Acaravci (2010), in order for the short run disequilibrium dynamics to conform back to long run equilibrium, the error correction term ought to be negative and statistically significant. Jardoon *et al.* (2015) further asserts that in the event that the error correction term is positive, the model should be doubted. In addition, he further asserts that the value of the error correction term must be greater than one for an exact portrayal of the model. In order to guarantee that the error correction model is well specified, steady and does not disregard the CLRM assumption, diagnostics and stability tests are likewise performed in the error correction model.

4.6.3 Diagnostics and stability test

According to Atique and Maliki (2012), diagnostics tests are utilised to check the legitimacy of the model. With respect to investigating that the variance of the residual is homoscedastic in other words heteroscedastic, the white test is utilised. By utilising the Jarque-Bera (JB) test, the model is evaluated on whether the data are normally distributed. The Breusch-Godfrey serial correlation LM test is also applied in order to check whether there exists autocorrelation. The CUSUM test is utilised to test for stability of the model and the Ramsey RESET test is used to check for misspecification errors. The study also uses the impulse repose test as well as the variance decomposition test in order to investigate the responsiveness of growth to shocks in other variables as well as shocks caused by itself. A detailed discussion on the above-mentioned tests follows below.

4.6.3.1 Heteroscedasticity

According to Ramanathan (1995), the Whites test for heteroscedasticity is a substantial sample test found to be helpful in models that contain not less than 30 observations. There are three things that can happen when the parameters are assessed utilising the OLS methodology, where the residuals are found to be heteroscedastic, namely the properties of best linear unbiased estimator (BLUE) does not hold anymore, secondly, approximations and forecasts exuding from these models are somewhat fair and steady and lastly the hypothesis test becomes invalid due to conflicting and one-sided computed variance and covariance (Ramanathan, 1995). The study of Madubeko (2010) further asserts that the test regression is controlled by regressing every cross result of the residuals on the cross results of the regressors and testing the joint significance of the regression. The White (1980) test for heteroscedasticity indicates that the null hypothesis for the white test is that there is no heteroscedasticity and misspecification. On the off chance that we neglect to reject the null hypothesis, this would imply that there is homoscedasticity. Therefore, the following equation is a representation of the null hypothesis:

$$\beta_1 = \beta_2 = \beta_3 ..... \beta_\delta = 0 \quad (4.13)$$

in such a way that β_δ is the last coefficient in the auxiliary regression of the heteroscedasticity test. In an instance where the probability value is higher than 0.05 percent level of significance, this will lead to the conclusion of failing to reject the null hypothesis. In other words, we accept the null hypothesis, indicating that there is no heteroscedasticity amongst that variables utilised in the study. On the off chance that the disturbance term does not have a consistent change, they are said to be heteroscedastic. The White test evaluates an element of squared residuals without normalisation in the following manner:

$$W = \hat{\mu}_t^{\,2} \quad (4.14)$$

Based on an estimation of an auxiliary function, Cameron (2005) asserts that the White heteroscedlasticity test will be in the following functional form:

$$\hat{\mu}_t^2 = \beta_0 + \sum_{t=1}^{\theta} \beta_0 X_{\theta t} + \sum_{t=1}^{\vartheta} \beta_2 X_{\vartheta t}^2 + \sum_{t=1}^{\mu,\omega} \beta_3 X_{\mu t} X_{\omega t 0} + \nu_t \quad (4.15)$$

In this auxiliary regression as asserted by Asteriou and Hall (2011), the squared residual is a function of constant β_0 and autonomous variables such as $X_{\theta t}$. The independent variables are represented by $X_{\vartheta t}^2$ where the cross products of the independent factors are represented by $X_{\mu t} X_{\omega t}$. Furthermore, from the regression above, the error term is indicated by ν_t. With or without cross terms, Asteriou and Hall (2011) suggest that this test can be assessed. Brooks (2008) developed numerous test for heteroscedasticity, however, this study will utilise the White heteroscedasticity test.

4.6.3.2 Serial correlation

According to Williams (2015), serial correlation happens in a time series model when the errors connected with a given period of time persist into future time periods. Moreover, there are distinctive sorts of serial correlation. At first, there is the first order serial correlation, where errors in one time period are associated directly with the errors in the current time period. With respect to positive serial correlation, errors in one time period are associated emphatically with errors in the next time period. In time series data, first order autocorrelation as asserted by Schmidt (2005) is the most common type of autocorrelation. First order autocorrelation can be represented in the following manner as noted by Schmidt (2005):

$$e_t = \rho e_{t-1} + \mu_t \quad \text{.....} \quad (4.16)$$

Where the serial correlation coefficient amongst the errors is represented by ρ and the residual is illustrated by μ_t. The condition above speaks to the principle first order autoregressive process. Furthermore, Williams (2015) notes that serial correlation will not influence the fairness or consistency of OLS estimators, although it affects their proficiency. In light of a positive serial relationship, the OLS estimates of standard errors will be somewhat smaller than the real standard errors. Therefore, this will lead to the conclusion that the parameter evaluations are more exact than they truly are. There will be a propensity to dismiss the null hypothesis when it ought not to be rejected in the first place. The most popular test for serial correlation is the Durbin-Watson statistic, which is used in the following manner:

$$DW = \frac{\sum_{t=2}^{T}(\hat{e}_t - \hat{e}_{t-1})^2}{\sum_{t=1}^{T}\hat{e}_t^2} \quad \text{.....(4.17)}$$

Where T is a representation of the number of time period. Moreover, the Durbin Watson statistic, d, gives a test of

$H_0 : \rho = 0$ (in the following determination)..... (4.18)

$\mu_t = \rho\mu_{t-1} + e_t$ (for the error terms)

In light of the details above, in the event that the test is rejected, there is confirmation for first order serial correlation. Furthermore, if d=2, then this indicates that there is no serial correlation. If d<2, this indicates the presence of positive serial correlation and if d>2 this indicates the presence of negative serial correlation. Moreover, this is on account that:

$d = \frac{\sum(\hat{\mu}_t - \hat{\mu}_{t-1})^2}{\sum\hat{\mu}_t^2}$ and $\hat{\rho} = \frac{\sum(\hat{\mu}_t.\hat{\mu}_{t-1})}{\sum\hat{\mu}_t^2}$ (estimated serial correlation coefficient)..... (4.19)

If no serial correlation exsists, then $\hat{\rho} = 0$ therefore d=0, if there is a certain serial relationship, i.e. at that point $\hat{\rho} > 0$, then d<2 and lastly, if there is a negative serial connection, i.e. at that point $\hat{\rho} < 0$ then d>2.

With regards to the OLS technique, the presence of serial correlation is viewed to be in conflict the CLRM presumptions. Although serial correlation, as asserted by Harvey (1990), illustrates that the error terms of a model are distributed dependently, there are consequences attached to ignoring serial correlation. These consequences include the fact that OLS estimates become biased, inefficient and inconsistent if serial correlation is present in the model, of which this is a violation of the CLRM assumptions (Schmidt; 2005).

4.6.3.3 Residual normality test – Jarque-bera test

In order to establish whether random variables are distributed normally, the normality test is utilised. Madubeko (2010) asserts that this test is connected to residuals that are from a linear

regression. One of the key CLRM presumptions is the normality of the error term. According to Cameron (2005), in the event that the residuals are not distributed normally or the assumption of CLRM is violated, the residuals ought not to be utilised as part of Z tests or other tests derived from the normal distribution, for example, the F tests and the chi-square test due to the fact that this will lead to the utilisation of insignificant levels brought on by incorrect t and f formulae.

The assumption of the normality test as asserted by Sibanda (2012) is $\varepsilon_t . \approx N(0,\sigma^2)$. According to Gujarati and Porter (2010), in order for variables to be normally distributed, the null hypothesis in this case is that the coefficient of skewness (α_3) is zero and the coefficient for kurtosis (α_4) is three; hence, this is represented by the following hypothesis indicated by Sibanda (2012):

$H_0 : \alpha_3 = 0$ Indicating that if α_3 is less than 0, then f(y_t / x_t) is skewed to the left side.

$\alpha_4 = 3$, Indicating that if α_4 is greater than 0, then f (y_t / x_t) is leptokurtic.

The above presumptions can be tried utilising the JB test. In the case where a high JB and a low probability value arise, Gujarati and Porter (2010) assert that the null hypothesis be dismissed; this is in light of the fact that this indicates the residuals are not normally distributed. The probability value ought to be more than 5 percent in order for this hypothesis to be accepted, hence implying that the residuals are normally distributed. However, in an event where the residuals are not normally distributed, Cameron (2005) notes that enhancing the model by rethinking the decision or definition of the variables utilised can be used as an approach to manage the issue of residuals not being normally distributed.

4.6.3.4 Ramsey RESET test

Atique and Maliki (2012) asserts that misspecification errors occur when some vital factors are overlooked from the model, in this case, the Ramsey reset test is utilised. Furthermore, the Ramsey test can also be defined as a general determination test for the direct linear regression model. The Ramsey RESET tests whether non-direct combination of the fitted qualities illuminates the reaction variable. The study of Cameron (2005) asserts that the specification error may emerge if the functional type of the model is said to be non-linear. Ramsey (1969)

proposed a general regression specification test by Gujarati and Porter (2010). Gujarati and Porter (2010) opine that the Ramsey test is said to be a very easy-to-use test with respect to testing for specification errors.

The nature of the test is based on the idea that lies behind the possibility that the model is misspecified if non-direct transfers of the autonomous variables have any constraint in rectifying the reaction variable. The Ramsey test takes after the fundamental thought behind the following model:

$$\hat{Y} = E\{y/x\} = \beta_x \quad \text{(4.20)}$$

In such a way that the test then assesses whether or not $(\beta x)^2, (\beta x)^3, (\beta x)^k$ have any methods conceivable in clarifying the dependent variable. Moreover, this is done through the estimation of a linear regression in the following way:

$$y = \alpha x + \gamma_1 \hat{y}^2 + \gamma_{l-1} \hat{y}^k + \varepsilon_t \quad \text{(4.21)}$$

Under the circumstance that null hypothesis of this test indicates that; there are no misspecification errors, this indicates that at the 5 percent level of significance, the probability value is higher than the critical significance level, leading to the conclusion that the null hypothesis is rejected and there are no misspecification errors detected.

4.6.3.5 CUSUM test

Following Brown, Durbin and Evans (1975), the CUSUM test depends on the cumulative sum of residuals; it is a test built from the recursive regressors. The CUSUM test is a graphical examination where W (the cumulative sum) must move inside the confidence band. Cameron (2005) indicates that the lines of confidence band plotted around W are given by the following equation:

$$W = +and - \left[0.948\sqrt{(k-k)} + 1.896\sqrt{(n-k)}\right] \quad \text{(4.22)}$$

There is proof that the model is steady if the W line moves inside the confidence band evaluated by the condition above. Moreover, together with a critical line of 5 percent, this test plots the cumulative sum. According to Atique and Malik (2012), the test also discovers parameter instability and recognises changes in a model, as it gauges boundaries of which changes in a

model ought not to breach. The plot of the CUSUM statistic must remain within the 5 percent critical level in order to ensure stability of the long and short run coefficients. The test has control of the principle repressors' direction and is known for its capacity to change variances.

4.6.3.6 Impulse response analysis

The impulse response analysis follows the responsiveness of the dependent variable with regards to shocks in other variables (Brooks, 2008). As indicated by Mazenda (2012), these shocks will eventually begin to die, if the model utilised is stable. Therefore, in this study, the impulse response analyses will indicate the magnitude and persistence of real and normal shocks with respect to economic growth and other variables utilized in the study. The study of Lutkepohl cited by Rusike (2007) clarifies that this approach considers historical pattern of connections among the distinctive shocks.

4.6.3.7 Variance decomposition

Further information on the connection between economic growth and debt is discovered utilising the variance decomposition analysis. Accordingly, Brooks (2008) clarifies that variance decomposition analysis gives the extent of developments in the dependent variables that are due to its own shocks against shocks to other variables.

4.7 CONCLUSION

In this chapter, the methodology employed in the study was discussed in detail, where the model was specified with respect to economic growth and debt in South Africa. The study utilises economic growth as the dependent variable and other variables suggested by the literature such as investment, government debt and foreign debt as independent variables. The study makes use of data, obtained from different sources, where this was discussed in detail. Moreover, the study discusses the variables selected in this study to conduct the investigation of debt and growth.

The methodology to which the main model will be estimated is discussed in detail, where the ARDL methodology modelled by Pesaran *et al.* (2001) was proposed and selected for this analysis. This methodology was selected because it has numerous advantages such as its simplicity. A detailed discussion of the ARDL model is discussed taking into account the model estimation and the error correction model. As a means to ensure that stationarity of the data

utilised by the study, the ADF and PP tests will be conducted, as discussed in detail. Furthermore, the study makes use of numerous diagnostics and stability tests, namely heteroscedasticity, autocorrelation, residual normality test, impulse response analyses and variance decomposition test in order to validate the outcomes of the estimated model. The study, therefore, will make use of a software, E-views 9.0, in order to conduct the investigation.

In light of outlining the methodology used in this study, the next chapter will present the empirical findings of the model.

CHAPTER 5: RESULTS AND INTERPRETATION

5.1 INTRODUCTION

Utilising the ARDL approach, this chapter presents the empirical analysis conducted in this study as an attempt to analyse the relationship between debt and economic growth in South African from 1970 to 2014. This chapter is divided into five sections where the empirical results are organised in the following manner: Section 5.2 comprises of the unit root stationarity tests; Section 5.3 consists of the ARDL bounds test, cointegration results, long run analysis, stability and diagnostic's results. Section 5.4 provides the impulse response results and discussion, Section 5.5 provides the results and a discussion obtained from the variance decomposition analysis. In the last section, the conclusion is provided.

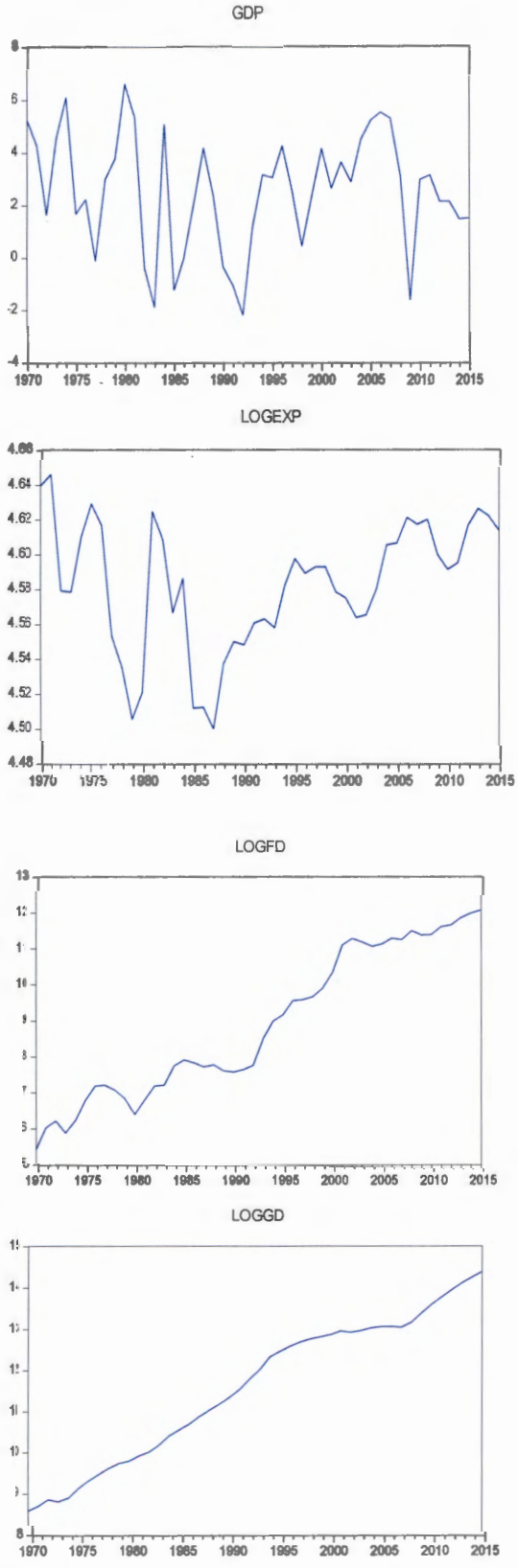
5.2 UNIT ROOT TESTS

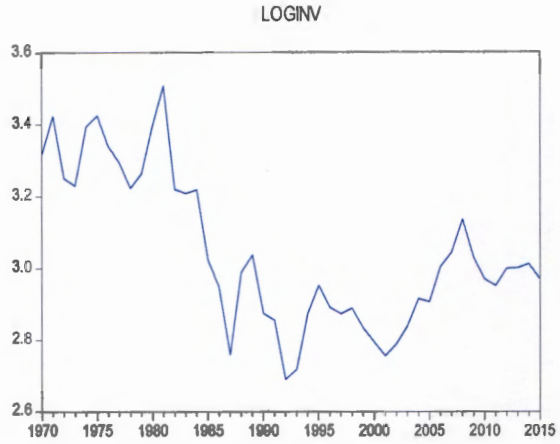
When dealing with stationarity, two tests generally are utilised as a means to examine whether or not the variables utilised are stationary. Amongst these two methods includes the formal test and the informal test in the form of a graphical representation. Moreover, when the variable is stationary, the variable must have a constant variance and mean, which will lead to the conclusion of stationarity in such a way that the null hypothesis of unit root will be rejected.

5.2.1 Informal unit root test

The most commonly used test for unit root takes into account the graphical analysis of a series, which is also identified as an informal test for unit root. Madubeko (2010) asserts that before pursuing any other formal test for stationarity, the first step would be to utilise a visual plot of the time series. The author further asserts that by making use of visual plots it is easier for the researcher to detect any structural breaks or errors that might have occurred with respect to data capturing. Therefore, the study will carry out the informal test, which is presented below in figures 5.1 and 5.2 respectively.

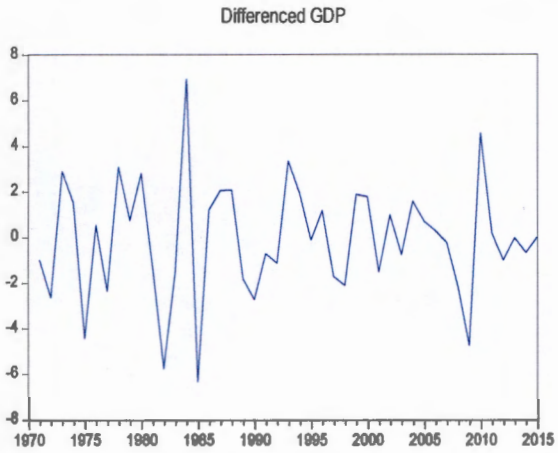
Figure 5.1 Graphical representation at levels

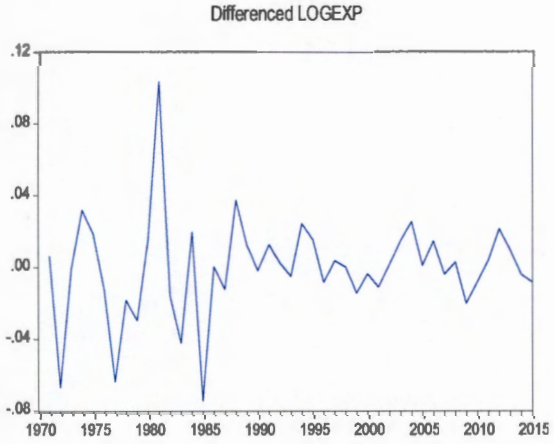


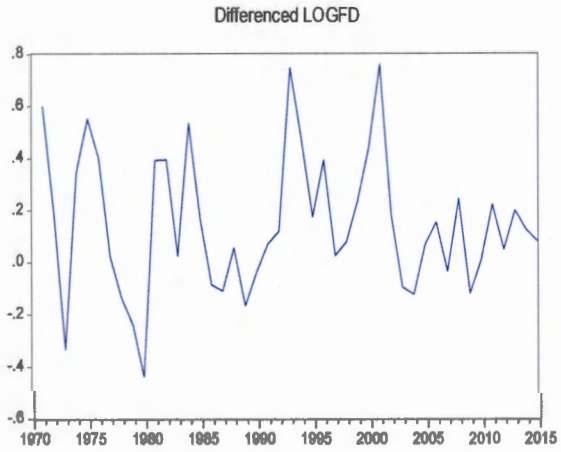


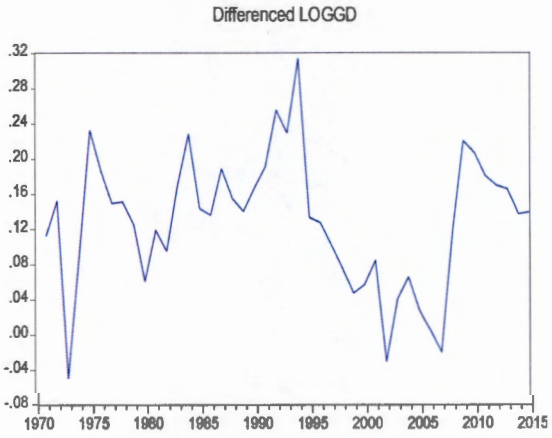
From the graphical representation illustrated above in Figure 5.1, the visual inspection results indicate that from all five variables utilised in this study, (GDP) appears to be stationary at levels. This implies that the variable GDP has a constant mean and a constant variance. However, based on the observed graphical results, it is appears that the variables LOGEXP, LOGFD, LOGGD and LOGINV are not stationary as variables LOGEXP, LOGFD, and LOGGD have increasing trends, whereas variable LOGINV has a decreasing trend. Therefore, this indicates that the null hypothesis is rejected, as the variables do not have a constant mean and variance. In this manner, the variables will be differenced.

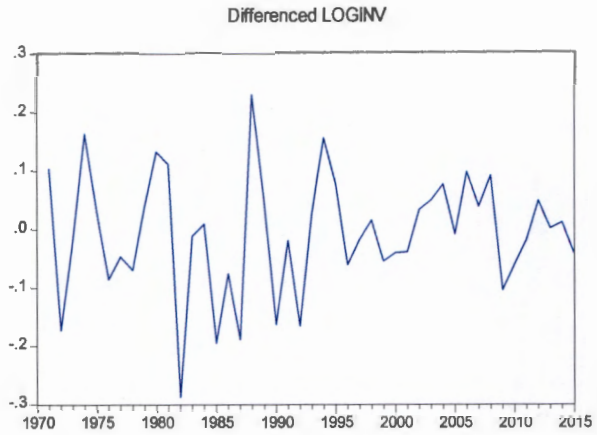
Figure 5.2 Graphical representation of differenced variables











As observed from the above graphical representation, when the variables are differenced once, they show evidence of stationarity. Therefore, variables LOGEXP, LOGFD, LOGGD and LOGINV are now stationary when they are differenced, indicating that they have a constant mean and a constant variable. Therefore, this implies that the null hypothesis is rejected, concluding that the variables are stationary, which concludes the section of informal testing for stationarity. As indicated previously, formal tests for stationarity are also conducted as the graphical representations are best known for indicating the order of integration. Hence, the ADF and PP test is conducted.

5.2.2 Formal unit root test for stationarity

Under a significance level of 5 percent, making use of both the ADF and PP tests respectively, the null hypothesis, which indicates that there is a unit root, is tested. Tables 5.1 and 5.2 below present a summary of the findings where all variables are stationary at 5 percent level of significance.

Table 5.1 ADF unit root test

Variable		Augmented Dickey Fuller test						Order of integration
GDP		LEVELS			1ST DIFFERENCE			
		T-STATS	C-VALUE	P- VALUE	T- STATS	C-VALUE	P- VALUE	Conclusion
	TREND	-4.759972	-3.584743	0.0003***	-7.081831	-3.592462	0.0000***	I(0)
	TREND & INTERCEPT	-4.701149	-4.175640	0.0024***	-6.985424	-4.186481	0.0000***	I(0)
	NONE	-2.951995	-2.617364	0.0040***	-7.169805	-2.619851	0.0000***	I(0)
LOGEXP	TREND	-2.901485	-2.602225	0.0531*	-5.824250	-3.600987	0.0000***	I(1)
	TREND & INTERCEPT	-3.251460	3.186854	0.0877	-6.087768	-4.198503	0.0000***	I(1)
	NONE	-0.150884	-2.617364	0.6261	-5.905460	-2.622585	0.0000***	I(1)
LOGFD	TREND	-0.375179	-3.588509	0.9045	-5.019550	-3.588509	0.0002***	I(1)
	TREND & INTERCEPT	-2.807939	-4.180911	0.2022	-4.950669	-4.180911	0.0012***	I(1)
	NONE	1.995292	-2.618579	0.9878	-4.351418	-2.618579	0.0001	I(1)
LOGGD	TREND	-0.647748	-3.588509	0.8491	-3.323680	-2.929734	0.0197**	I(1)
	TREND & INTERCEPT	-1.858348	-4.180911	0.6589	-3.309616	-4.180911	0.0780	I(1)
	NONE	2.560296	-2.618579	0.9969	-1.524520	-2.618579	0.1181	I(1)
LOGINV	TREND	-1.867666	-3.584743	0.3441	-6.734805	-3.588509	0.0000***	I(1)
	TREND & INTERCEPT	-2.007365	-4.175640	0.5816	-6.756546	-4.180911	0.0000***	I(1)
	NONE	-0.627752	-2.617364	0.4398	-6.749716	-2.618579	0.0000***	I(0)
Notes: ***, **, ** represents levels of significance at 1%, 5% and 10% respectively.								

Source: Authors own table

The study made use of ADF unit root test, taking into consideration the trend, trend and intercept and model specification. Moreover, the ADF test conducted reveals that as indicated in the graphical analysis, GDP is the only variable that is integrated of order I(0) and the other variables LOGEXP, LOGGD, LOGFD, and LOGINV are only stationary when differenced, implying that they are integrated of order I(1). Furthermore, Madubeko (2010) concurs that the use of both ADF and PP tests simultaneously is because the use of only one test is unreliable. The PP test results follow below:

Table 5.2 PP test for unit root

Variable		Phillips Peron test						Order Of integration
GDP		LEVELS			1ST DIFFERENCE			
		T-STATS	C-VALUE	P- VALUE	T- STATS	C-VALUE	P- VALU	CONCLUSION
	TREND	-4.599256	-3.584743	0.0006***	-22.03137	-3.588509	0.0001***	I(0)
	TREND & INTERCEPT	-4.528255	-4.175640	0.0039***	-22.15381	-4.180911	0.0000***	I(0)
	NONE	-2.808535	-2.617364	0.0060***	-20.18326	-2.618579	0.0000***	I(0)
LOGEXP	TREND	-2.977192	-2.928142	0.0448**	-6.812585	-3.588509	0.0000***	I(1)
	TREND & INTERCEPT	-3.000835	-4.175640	0.1433	-7.971667	-4.180911	0.0000***	I(1)
	NONE	-0.223634	-2.617364	0.6001	-6.944177	-2.618579	0.0000***	I(1)
LOGFD	TREND	-0.745998	-3.584743	0.8244	-4.994776	-3.588509	0.0002***	I(1)
	TREND & INTERCEPT	-1.906624	-4.175640	0.6346	-4.923253	-4.180911	0.0013***	I(1)
	NONE	2.943012	-2.617364	0.9989	-4.392358	-2.618579	0.0000***	I(1)
LOGGD	TREND	-0.618240	-3.584743	0.8562	-3.337960	-2.929734	0.0190**	I(1)
	TREND & INTERCEPT	-1.476204	-4.175640	0.8232	-3.326568	-4.180911	0.0753	I(1)
	NONE	6.192317	-2.617364	1.0000***	-1.312351	-2.618579	0.1723	I(1)
LOGINV	TREND	-1.719937	-3.584743	0.4146	-7.187832	3.588509	0.0000***	
	TREND & INTERCEPT	-1.910670	-4.175640	0.6325	-9.668889	-4.180911	0.0000***	
	NONE	-0.856248	-2.617364	-2.617364	-7.053930	-2.618579	0.0000***	
Notes: ***, **, ** represents levels of significance at 1%, 5% and 10% respectively.								

Source: Authors own table

The results obtained from the ADF and PP test reveals similar results that indicate the variables utilised in the study are stationary and the variable GDP is stationary at levels, indicating that it is integrated of order I(0). Both tests also reveal that LOGEXP, LOGGD, LOGFD, and LOGINV are stationary when differenced as the visual inspection/formal test indicated. Therefore, this confirms that LOGEXP, LOGGD, LOGFD, and LOGINV are integrated of order I(1). This further serves as an indication that the variables specified can be utilised making use of the ARDL modelling, since the ARDL modelling requires that variables should be integrated of order I(0) and I(1) jointly or separately. The ADF test also indicates that LOGEXP, with a trend, is also stationary at levels. Both formal and informal tests concur that GDP is stationary at levels and LOGEXP, LOGGD, LOGFD, and LOGINV are stationary when differenced, hence integrated of order I(0) and I(1) respectively.

5.3 ARDL BOUNDS TESTING

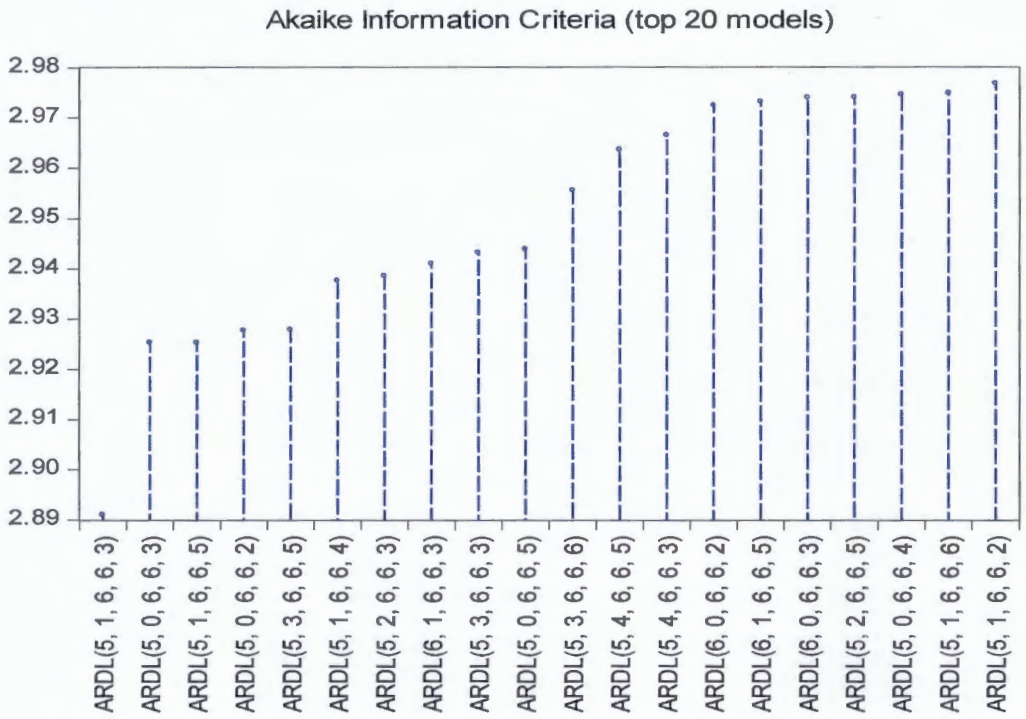
Following the stationarity testing, the next procedure with respect to ARDL modelling is to specify the model, which was indicated in the previous chapter as Equation 4.9. The second step in the ARDL procedure requires that the bound testing procedure follow in order to investigate the presence of long run relationship amongst the variables. Furthermore, the Wald test is used in order to indicate the existence or absence of cointegration. Following this step is making use of the Akaike and the Schwartz Information Criteria to discover the ideal optimal lag length for the long run coefficients. Following the detection of cointegration is the error correction model and the diagnostics and stability test.

In order to begin with the ARDL procedure, the ARDL procedure is employed first on the entire model including variables. It is from this procedure that the results will determine whether specific variables should be dropped, or should different lags be used. However, if the selected model proves to be problematic, the study will continue with the selected model throughout its analysis.

5.3.1 Lag length selection

Based on the model specified as Equation 4.9, the model indicates that GDP is a function of EXP, INV, GD, and FD. The study, therefore, will follow this model in order to determine the best model, based on the information provided by the Akaike and the Schwartz Information Criterion. The graph below is a representation of the Akaike Information Criteria for selection of the best ARDL model.

Figure 5.3 Model selection criteria graph



With the assistance of Eviews 9, the model selection graph provides the study with the top 20 best models that the study can utilise in its analysis. These models are arranged in such a way that indicates which model is best to use and its corresponding lag. By observation from the graph above, the Akaike Information Criteria graph indicates that models with five lags is the best model to utilise. The study therefore makes use of lag five in order to see whether lag five model will yield the best results taking into account the diagnostics and stability test.

The table below provides a summary of the Akaike and the Schwarts coefficients, which seem to concur with the graphical analysis above. The information provided by the graph indicates that the model with five lags is best with respect to the Akaike coefficient and the model with six lags seems to be a best model with respect to the Schwartz criterion.

Table 5.3 Lag selection

Model selection based on AIC and SIC		
Regressors/lag	**AIC**	**SIC**
1	3.821446	4.222927
2	3.981310	3.700679
3	3.422185	3.913683
4	3.434211	4.013434
5	**3.395791**	4.315269
6	3.988799	**3.287947**

The study of Posanda and Buckey (2004) asserts that the Akaike and Schwatrz Information Criteria are used to measure the amount of data lost. This indicates that the model with a low AIC and SIC is favoured (Posada & Buckely, 2004; Jones, 2011). Therefore, based on Table 5.3, the results indicate that the lowest AIC value is indicated by lag five and the lowest SIC is observed in lag six. Such a scenario requires either the use of lag six model or lag five model as the best model. The study will make use of lag five model, as the graphical analysis has already confirmed that lag five model will yield the best results.

5.3.2 Bounds testing for cointegration

Under the null hypothesis of no cointegration, $H_0 : \beta_{GDP} = \beta_{GD} = \beta_{FD} = \beta_{EXP} = \beta_{INV}$, the selected model will be used to test for cointegration. In this way, the Wald test is utilised in order to compute the t-stats, which will be compared to the critical bounds specified. The critical bounds and the f-stats for the model, taking into account lag five, are presented in Table 5.4.

Table 5.4 Bounds testing

Bounds testing lag 5 model		
F- Statistic: 8.823039		
Critical values		
Significance	**Lower bound**	**Upper bound**
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06
Conclusion: Cointegration		

Following the general rule of ARDL cointegration, namely if the f-stats is greater than the upper bound critical value, there is cointegration and if the f-stats is lower than the critical value of the lower bound, there is no cointegration. The results obtained illustrate that the study rejects the null hypothesis of no cointegration, implying that the alternative hypothesis is accepted. Therefore, this indicates that there is a long run relationship between economic growth and debt in South Africa.

5.3.3 Long run analysis

After establishing that there is indeed a cointegration relationship between the variables, this simply indicates that a long run relationship exists. Therefore, Table 5.6 below presents the cointegration, long run relationship, stability and diagnostics results amongst the variables and their explanation follows in detail.

5.3.4 Cointegration, long run, stability and diagnostics test

The study presents a summarised table of the findings below:

Table 5.5 Cointegration, long run, stability and diagnostics results

Dependent Variable: GDP				
Sample size: 1970-2015				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LOGEXP	-11.124770	6.550740	-1.698246	0.1058
LOGFD	0.960644	0.177775	5.403698	0.0000
LOGGD	-0.956566	0.251312	-3.806288	0.0012
LOGINV	1.471853	0.881072	1.670525	0.1112
C	52.248060	27.653338	1.889394	0.0742
CointEq(-1)/ ect (-1)	-2.969291	0.479340	-6.194546	0.0000
R-square: 0.874971				

DIAGNOSTICS AND STABILITY TEST					
Test	**Null hypothesis**	**Statistic**		**Probability value**	**Conclusion**
Jarque-Bera test	Residuals are normally distributed	JB -statistic Skewness Kurtosis	1.618440 -0.067978 2.036208	0.445205	Residuals are normally distributed
Serial correlation: Breusch Godfrey	No serial correlation	Obs* R-squared	4.120509	0.1274	There is no serial correlation
Heteroscedasticity: Breusch-Pagan Godfrey	No heteroscedasticity	Obs* R-squared	19.92605	0.5259	There is no heteroscedasticity
Heteroscedasticity: White test	No heteroscedasticity	Obs* R-squared	21.18266	0.4478	There is no heteroscedasticity
Specification error: Ramsey RESET test	Model is correctly specified/ no misspecification errors	T-statistic F- Statistic	0.663354 0.440039	0.5155	There is no misspecification errors

Representation:

$$GDP = -(-11.1248 LOGEXP^{*} + 0.9606^{*} LOGFD - 0.9566^{*} LOGGD + 1.4719^{*} LOGINV + 52.2481)$$

Log run interpretation:

Expenditure (LOGEXP)

There is a statistically positive insignificant relationship between expenditure and economic growth. This implies that a 1 percent increase in expenditure will, on average, result in an 11.12 percent increase in economic growth.

Foreign debt (LOGFD)

There is a statistically negative significant relationship between foreign debt and economic growth. This implies that a 1 percent increase in foreign debt will, on average, result in a 0.96 percent decrease in economic growth.

Government debt (LOGGD)

There is a statistically positive significant relationship between government debt and economic growth. This implies that government debt will, on average, result in a 0.95 percent increase in economic growth.

Investment (LOGINV)

There is a statistically negative insignificant relationship between investments and economic growth. This implies that investment will, on average, result in a 1.47 percent decrease in economic growth.

Based on the results obtained from the analysis, the results are in conjunction with the existing literature as the negative significant relationship between economic growth and foreign debt is also observed by the studies of Ayadi and Ayadi (2008), Atique and Malik (2012), and Ejigauyehu (2013), amongst many other studies. The positive significant relationship between economic growth and government debt is identified by researchers such as Moki (2012), Abbas (2005), and Abbas and Christensen (2010). Furthermore, the studies of Wu *et al.* (2010), Ebong *et al.* (2016), and Ekpo (1996) indicate a positive relationship between expenditure and economic growth, which is in conjunction with the findings of this study. Moreover, as

indicated by the results obtained in this study, investments are said to have a negative insignificant relationship to economic growth. Previous studies in conjunction with the findings of this study are amongst the studies of Mehara and Musau (2013), and Kanu *et al*, (2014), which indicate an insignificant relationship between investments and economic growth.

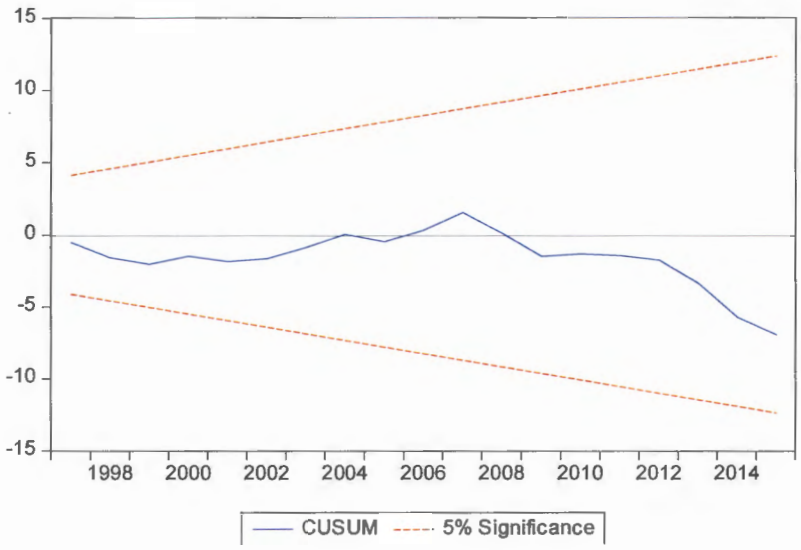
In order to determine the speed of adjustment and the linkages between the long and short run relationship of the variables in order for them to return to equilibrium, Gujarati and Porter (2010) indicate that the error correction term must be negative and statistically significant. The results obtained from the study indicate that the error correction term is negative and statistically significant, with a probability value of 0.0000 and a coefficient of -2.969291, which is an indication of the speed of adjustment from a period of disequilibrium to a period of equilibrium. Moreover, the coefficient indicates that 20 percent of disequilibrium is adjusted for the next period. Furthermore, an 87 percent variation in the dependent variable is explained by the independent variable as indicated by the R-squared coefficient.

Table 5.5 above presents the results obtained from the stability and diagnostics test. The results indicate a JB-statistic of 1.618440 and a probability value of 0.445205, which is greater than the 5 percent level of significance. This indicates that the study fails to reject the null hypothesis and conclude that the residuals are normally distributed. Moreover, with respect to the serial correlation test, the probability value of 0.1274 lies above the 5 percent level of significance, hence indicating that the null hypothesis cannot be rejected and leads to the conclusion that there is no serial correlation. Heteroscedasticity tests were conducted and both the White and the Breusch-Godfrey tests indicated that the probability values 0.5259 and 0.4478 are greater than the 5 percent level of significance, indicating that the null hypothesis cannot be rejected because there is no heteroscedasticity. The Ramsey reset test was also conducted and the results illustrate that the null hypothesis of no misspecification errors cannot be rejected as the probability value 0.5155 lies above the 5 percent level of significance, indicating that there are no misspecification errors.

5.3.4.1. CUSUM test

The graphs depicted below represent the results obtained from the CUMSUM test.

Figure 5.4 CUSUM results



In order to illustrate the stability of a model, the CUSUM test is utilised. The cumulative sum of squares lies within the prescribed critical level of significance, which is 5 percent, in order for the model to be stable. The test confirms that the model utilised is indeed stable because the plot recursive residuals indicated by the line within the 5 percent parameter, lie with the confidence band. Therefore, this serves as an indication that the assumptions of the CLRM are met with respect to the diagnostics and stability tests.

5.4 IMPULSE RESPONSE ANALYSIS

Since this study focuses on the impact of debt on economic growth in South Africa, only the responses of economic growth to economic growth and economic growth to the other independent variables are illustrated in Figure 5.6 below. The basic function of the impulse response is to illustrate the dynamic response of GDP to a one period standard deviation shock with respect to the changes within the system, also to indicate the direction and steadiness of the response to each shock over a period of 10 years. Moreover, the impulse response results indicate the expected pattern of the short run relationship analysis.

Figure 5.5 Impulse response graphical results

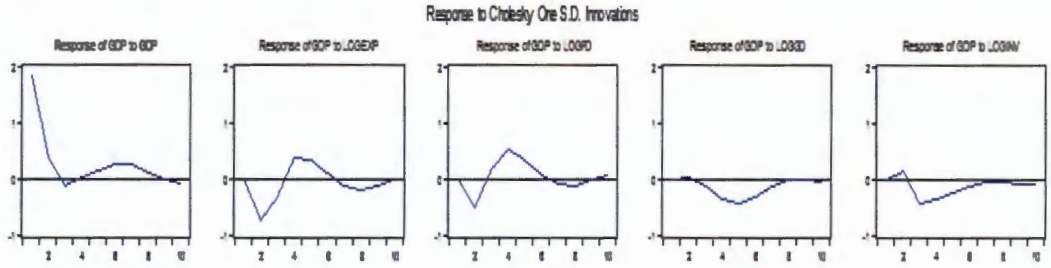


Table 5.6 Impulse response table

Response of GDP:	GDP	LOGEXP	LOGFD	LOGGD	LOGINV
1	1.835798	0.000000	0.000000	0.000000	0.000000
2	0.377946	-0.735883	-0.527474	0.001285	0.143205
3	-0.128993	-0.316275	0.160872	-0.125565	-0.455787
4	0.017561	0.365822	0.506310	-0.384589	-0.361720
5	0.133370	0.320249	0.316846	-0.455106	-0.252759
6	0.267998	0.089169	0.063500	-0.313933	-0.145469
7	0.249542	-0.127520	-0.111142	-0.134624	-0.067281
8	0.101445	-0.204811	-0.122197	-0.029664	-0.069714
9	-0.032674	-0.127622	-0.024009	-0.020222	-0.097350
10	-0.085860	-0.016225	0.059937	-0.055200	-0.101612

The shocks depicted in the table and graph above illustrate that GDP has a positive impact on itself with values reaching almost 2 percent. However, during period 3, this positive trend becomes negative and starts to steadily increase from that point onwards until time period 8. It is only after period 8 that GDP starts to gradually decline. Changes in EXP start off as positive in period one, but these changes become negative in period 2. Moreover, it is from period 3 that positive improvements gradually increase until period 7, where these improvements begin to have a negative impact on GDP and slowly start to improve. With respect to FD, the shocks have a rather negative response on GDP, but from period 3 to period 6, positive responses are noticed. It is only after period 6 that the response continues to be negative. Based on the above discussion, the impulse response results indicate that the model utilised in this study is stable.

The shocks illustrated on GD have a rather negative response and a depreciation impact with respect to GDP. It takes the first two years for the shocks to be positive, however, the response continues to be negative from period 3 up until period 10. The results further illustrate that INV has a positive impact on GDP only in the first two time periods. These impacts, however, are not sustained for long. From period 3, the shocks begin to become negative at an increasing rate. Furthermore, shocks to the variables are significant even though they are not persistent.

5.5 VARIANCE DECOMPOSITION

Evaluating the movement of shocks of one variable with respect to another, below are the results of the variance decomposition analysis in graphical and table form.

Figure 5.6 Variance decomposition results

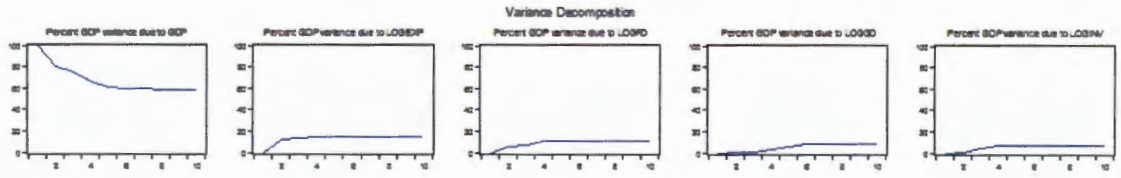


Table 5.7 Variance decomposition results

Variance Decomposition Of GDP:	S.E.	GDP	LOGEXP	LOGFD	LOGGD	LOGINV
1	1.835798	100.0000	0.000000	0.000000	0.000000	0.000000
2	2.086447	80.69809	12.43951	6.391267	3.79E-05	0.471090
3	2.172399	74.79126	13.59422	6.443904	0.334120	4.836497
4	2.321325	65.50825	14.38941	10.40090	3.037490	6.663957
5	2.424933	60.33254	14.93020	11.23836	6.305768	7.193135
6	2.466540	59.49480	14.56143	10.92868	7.714753	7.300334
7	2.489449	59.40966	14.55706	10.92779	7.865861	7.239635
8	2.504050	58.88296	15.05678	11.03886	7.788430	7.232962
9	2.509598	58.63984	15.24889	10.99926	7.760523	7.351491
10	2.514494	58.52828	15.19372	11.01328	7.778521	7.486190

The results provided in the table and graph are obtained over a 10-year period. As suggested by Brooks (2002), with respect to the dependent variable GDP, the variance obtained serves as an explanation of the variation of GDP to the shocks and changes. During the first year under examination, 100 percent of variation in GDP is as a result of GDP. Moreover, during period 3, about 74 percent of variation in GDP is explained by itself. Accounting for approximately 23 percent of the error variance, a combination of the explanatory variables is responsible for 23 percent of their error variance. EXP accounts for 13, FD 6, GD 0.33 and INV 4 percent. During period 10, GDP is responsible for 58 percent of variation with respect to itself, where the remaining amount of variation is explained by the independent variables in such a way that they are responsible for 15, 11, and 14 percent respectively.

With respect to EXP, at period 1, EXP was responsible for 0 percent of variation with respect to GDP whereas in period 10, EXP was responsible for 15.19 percent of variation in GDP. This serves as an indication that EXP accounts for more variation as time goes by.

FD accounted for 0 percent of variation in GDP in period 1 whereas in period 10 it accounted for 11 percent of variation. This illustrates that the variation indicated by FD is approximately 1-0.5 percent from period 1 to period 10.

In period 1, GD explained 0 percent variation in GDP as compared to 7 percent in period 10. This indicates that GD accounts for more as time progresses, however, this progression is relatively low.

INV explained 0 percent of variation in period 1, however, from period 2, the variation gradually increased to 7 percent in period 10. Based on the results obtained, a significant proportion of variation with regards to GDP was justified by the shock observed in the explanatory variables, which justifies economic theory.

5.6 CONCLUSION

The study evaluated the relationship between debt and economic growth in South Africa from 1970 to 2015, making use of econometric analysis with the assistance of E-views 9 software. The study made use of the ARDL bounds testing procedure in order to investigate the relationship between debt and growth in South Africa. Stationary testing procedures were

conducted, making use of both ADF and PP test, of which both confirmed that the variables utilised by the study are stationary either at level or when differenced.

With respect to the short and long run relationship of the variables, the model selection needed to be analysed making use of the Akaike Criteria graph and the Schwartz Information Criterion. From the Akaike Criteria graph, it was indicated that a model with 5 lags was best. Therefore, the study conducted its analysis using the model with 5 lags.

With respect to the cointegration and long run relationship, the bounds test was conducted where there was evidence of cointegration amongst the variables. The long run relationship amongst the variables indicated that there is a negative relationship between GDP and LOGEXP and LOGGD. The results also indicated that a positive relationship exists between GDP and LOGFD and LOGINV. The error correction term proved to be negative and significant, also indicating that there is a -2.969291 speed of adjustment back to equilibrium, implying that 20 percent of disequilibrium will be corrected in one year.

Moreover, diagnostics and stability tests were conducted, where the results obtained confirmed that there is no heteroscedasticity, the residuals are normally distributed, there is no serial correlation and there are no misspecification errors in the model utilised. The CUSUM and CUSUMQ tests also proved to be stable and statistically significant, indicating that the model utilised in this analysis is stable. Furthermore, the impulse response analysis was conducted, where the results obtained concurred with the cointegration findings. The variance decomposition analysis was also conducted and the results illustrated that throughout the entire analysis, GDP is self-explanatory. However, variables such as LOGGD and LOGINV explained the least variation in GDP.

As indicated in the results obtained from the impulse response analysis, expenditure and government debt respond in a different direction as indicated by the ARDL estimation. The impulse response indicates a negative response from GDP when there is a shock to expenditure and government debt. However, the long run ARDL estimation indicated a positive relationship. Furthermore, a negative relationship was illustrated by the long run ARDL estimation between foreign debt and investment, which is indicated in the impulse response analysis. The variance decomposition indicated that expenditure accounted for approximately 15 percent of variation in GDP. However, the long run estimation indicated an insignificant yet positive relationship between expenditure and debt. The variance decomposition also indicated

that from all the variables, investment accounted for approximately 7.48 percent of variation in GDP, which is the smallest contributor. This is in agreement with the results obtained from the long run estimation, which indicated an insignificant relationship between GDP and investment.

The results obtained in this study illustrated consistency with respect to the current economic and political events taking place in South Africa. As a developing country, South Africa has its fair share of socio economic problems such as unemployment and poverty. It is through programmes such as the RDP, EPWP and ASGISA that the government aims to deal with its imbalances. It is in this way that the results obtained illustrate that a positive relationship between growth and expenditure exists. As of late, Standard and Poor has downgraded South Africa's credit rating to junk status. According to Standard and Poor (2017), this was on account of numerous incidents such as the reshuffling of cabinet members by the South African president, the dismissal of the minister of finance, the depreciation of the rand and extreme amounts of debt most especially debt acquired by the energy company Eskom. These events support the findings obtained by this study.

Lastly, the results obtained from this study can be seen as reliable and resourceful as evidence points that the models are in agreement with the assumptions of the CLRM with respect to the stability and diagnostics tests conducted.

CHAPTER 6: CONCLUSION, POLICY IMPLICATIONS, RECOMMENDATIONS AND LIMITATIONS

6.1 INTRODUCTION

This chapter presents the overall summary of the study, policy implications, recommendations, limitations and suggestions for further study. In an effort to investigate the relationship between government and foreign debt and economic growth in South Africa, the autoregressive distributive lag model (ARDL) technique was utilised. The objectives of the study were realised through numerous ways including an extensive review of the trends of debt and growth in South Africa and through an extensive review of the theoretical and empirical literature.

This chapter consists of three sections. In the first section, Section 6.2, the key findings of the empirical analysis of the study are provided. Section 6.3 articulates the policy implications and recommendations emanating from the empirical findings. In the last section, Section 6.4, the limitations of the study are discussed and suggestions are made for further research.

6.2 KEY FINDINGS

Based on the study's main objective to examine the trends of government and foreign debt and economic growth in South Africa, by employing the ARDL techniques and reviewing both the empirical and theoretical literature of debt and economic growth, the main hypothesis of this study was that government and foreign debt have no significant impact on economic growth in South Africa. However, based on the results obtained from the study, it is evident that government and foreign debt have a significant relationship with economic growth. The results indicate that there is a negative significant relationship between foreign debt and economic growth, where a 1 percent increase in foreign debt, on average, will result in a 0.96 percent decrease in economic growth. The results also indicate that there is a positive significant relationship between government debt and economic growth, where government debt was found to exert a 0.95 percent increase in economic growth. Moreover, growth is influenced positively by government expenditure, as the results indicate that a 1 percent increase in expenditure, on average, will result in an 11.12 percent increase in economic growth.

Furthermore, unanticipated results were obtained by the study, where growth was found to be affected negatively by investment, where investment was found to exert a 1.47 percent decrease

on economic growth. The study of Anderson (1990) indicates that even though investments play a major role in the development and growth of a country, they only play a greater role when used efficiently. There exist different types of investments that impact growth differently, which could mean that South Africa has not used investments efficiently and effectively in such a way that will lead to an increase in output. Hence, Anderson (1990) further asserts that if investments are set to be inefficient, a decreased growth rate and output will result.

Past studies on debt and growth indicate that a positive relationship exists between government debt and external debt, whereas some studies conclude that an inverse relationship between the two exists (Atique & Malik, 2012). Studies regarding the negative significant relationship between foreign debt and growth are those by Ayadi and Ayadi (2008), Atique and Malik, (2012) and Ejigauyehu (2013). Studies that are in conjunction with the findings of this study regarding the positive relationship between government debt and economic growth are those by Moki (2012), Abbas (2005) and Abbas and Christensen (2010). Moreover, studies of Wu *et al.* (2010), Ebong *et al.* (2016) and Ekpo (1996) reveal a positive relationship between expenditure and growth, while studies by Mehara and Musau (2013) and Kanu *et al.*, (2014) indicate an insignificant relationship between investment and growth as obtained in this study. All the tests conducted by this study passed the diagnostics and stability tests, thereby indicating that the tests conformed to the assumptions of the CLRM.

6.3 POLICY IMPLICATIONS AND RECOMMENDATIONS

As a means of providing resources, nations end up resorting to external borrowing (Korkmaz, 2015). Even though the intentions to acquire financial assistance are aimed at enhancing and promoting economic growth and development, the results obtained in the study reveal that foreign debt has a negative relationship to economic growth. Unreasonable debt obligations influence South Africa's economic growth in various ways. The expansive debt service obligations lead to the depletion of foreign exchange and capital, because capital is transferred to lenders to pay back interest. Furthermore, South Africa benefits partially from an expansion in output or exports because a developing fraction of the expansion is used as a means of servicing the acquired debt. South Africa is viewed as a high-risk nation, when its debt service obligations cannot be fulfilled, which makes it even more difficult for the country to acquire new credit. It is because of this that the debtor country has to pay high loan costs when they acquire financial assistance. The interest rate on the debt makes the debtor country worse off,

as the more money they borrow, the higher the interest rate. Moreover, the accumulation of debt leads to decreased economic productivity, since it becomes hard for South Africa to adjust to shocks, both domestically and internationally.

Based on the results obtained, the South African government should develop organisations that monitor the level of foreign debt, as indicated in the literature, due to the fact that unsustainable debt levels, at a certain point, can lead to debt crowding out or even debt overhang. Therefore, this indicates that debt levels should be monitored and maintained at all times. The government also needs to put policies in place with regards to government officials' misuse of resources that are actually meant for enhancing the country; hence, the issue of transparency should be addressed. The South African government should invest in improving the existing debt management programmes by focusing more on ensuring that the amount of public and foreign debt that is required and should be made explicit to all South African citizens, plus a motivation of why the debt is required. This, in turn, could fight against corruption and ensure that money is injected into the right industries that actually need assistance.

The government, in acquiring financial assistance, should also make an explicit record of how they plan to repay the debt and define their debt targets. The study of Ayadi and Ayadi (2008) further asserts that a sound macroeconomic environment is a vital element for growth as it is essential for the proper utilisation of external funds. Moreover, the government should encourage productive investments and expenditures that enable them to minimise the subjectivity of having to borrow money in order to finance infrastructure and other development projects in South Africa. Therefore, South Africa should acquire external loans for well-appraised, self-liquidating and high priority projects that will actually bring about positive change in the economy. Finally, government should formulate and adopt new debt sustainability policies, which will assist in facilitating economic growth in South Africa

6.4 LIMITATIONS OF THE STUDY AND SUGGESTIONS FOR FURTHER RESEARCH

The limitation of this study is that, with respect to data collection, the study does not make use of other components of debt such as bonds, multi-lateral debt and sovereign and non-sovereign debt to analyse the relationship between debt and growth. The study made use of the overall data set of foreign debt and government debt in South Africa as opposed to utilising the data of components/contributors of debt. The study's focus was on South Africa as a whole,

therefore, the study does not analyse the provisional aspects of debt as a contribution to the actual debt ratio. This could be achieved in a panel data study as the study is only limited to time series analysis of debt and growth at a national level. Further research on dealing with this analysis should pursue investigating the relationship between foreign and government debt on economic growth together and not separately, as numerous studies tend to analyse either the impact of government debt on growth or the impact of foreign debt and growth. Furthermore, more studies should be conducted with respect to South Africa. An area of recommendation would be to investigate the industry and provisional contribution of debt to South Africa.

The data for government debt for 2016 was not available at the time of acquiring the data. It is for this reason that the analysis is from 1970 to 2015.

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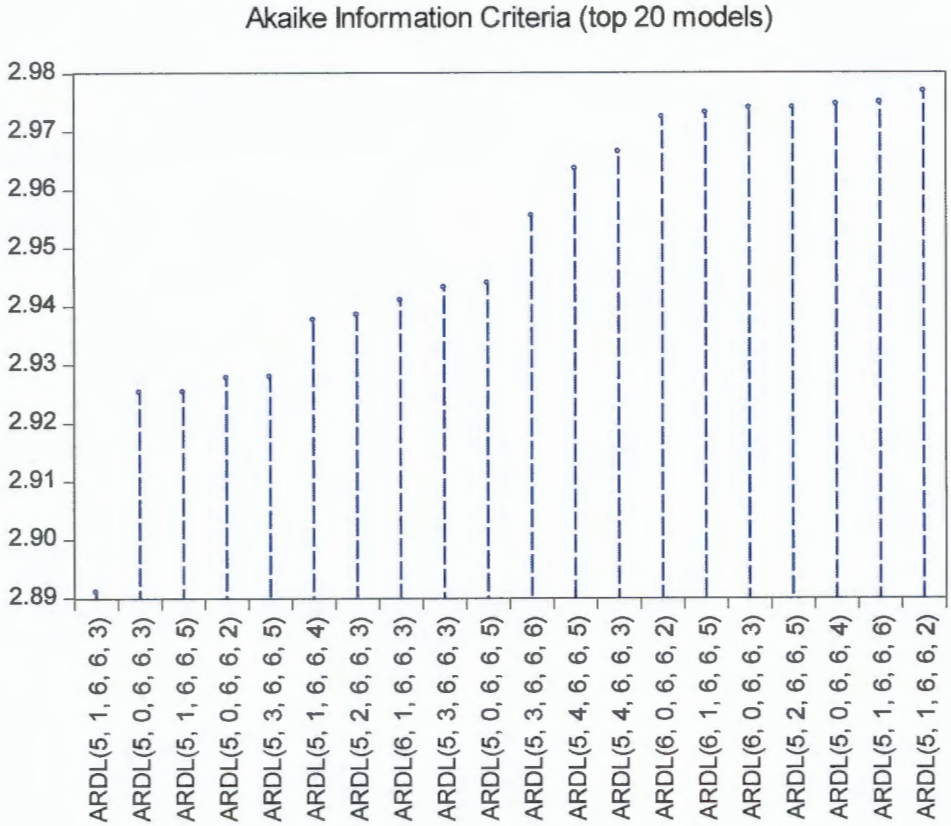
APPENDIX 1: DATA

Date	government debt	foreigndebt	gdp	expenditure	investment	
1970	5372.00	228.00	5.25	103.53	27.62	
1971	6014.00	416.00	4.28	104.19	30.68	
1972	7007.00	502.00	1.65	97.47	25.82	
1973	6671.00	360.00	4.57	97.40	25.30	
1974	7287.00	510.00	6.11	100.56	29.79	
1975	9199.00	886.00	1.70	102.47	30.74	
1976	11089.00	1325.00	2.25	101.22	28.23	
1977	12884.00	1356.00	-0.09	94.99	26.95	
1978	14991.00	1184.00	3.01	93.28	25.14	
1979	16982.00	934.00	3.79	90.56	26.15	
1980	18046.00	603.00	6.62	91.97	29.86	
1981	20329.00	894.00	5.36	102.01	33.38	
1982	22362.00	1328.00	-0.38	100.41	25.05	
1983	26540.00	1362.00	-1.85	96.27	24.77	
1984	33349.00	2327.00	5.10	98.18	25.01	
1985	38507.00	2754.00	-1.21	91.15	20.58	
1986	44133.00	2530.00	0.02	91.20	19.08	
1987	53323.00	2267.00	2.10	90.08	15.80	
1988	62272.00	2399.00	4.20	93.51	19.88	
1989	71683.00	2033.00	2.39	94.69	20.87	
1990	84724.00	1956.00	-0.32	94.53	17.73	
1991	102586.00	2099.00	-1.02	95.73	17.40	
1992	132474.00	2367.00	-2.14	95.96	14.75	
1993	166704.00	4996.00	1.23	95.47	15.16	
1994	228188.00	8058.00	3.20	97.82	17.72	
1995	260800.00	9610.00	3.10	99.34	19.17	
1996	296330.00	14259.00	4.30	98.51	18.04	
1997	328048.00	14647.00	2.60	98.87	17.72	
1998	353929.00	15842.00	0.50	98.89	17.99	
1999	371099.00	20025.00	2.40	97.47	17.04	
2000	392914.00	31118.00	4.20	97.12	16.37	
2001	427655.00	66619.00	2.70	96.05	15.74	
2002	414885.00	79877.00	3.70	96.20	16.28	
2003	432020.00	72617.00	2.95	97.63	17.11	
2004	461419.00	64207.00	4.55	100.14	18.47	
2005	474499.00	68787.00	5.28	100.26	18.31	
2006	476911.00	80326.00	5.59	101.73	20.19	
2007	467450.00	77608.00	5.36	101.34	20.99	
2008	525896.00	99171.00	3.19	101.62	23.01	
2009	655794.00	88088.00	-1.54	99.59	20.73	
2010	806893.00	88926.00	3.04	98.76	19.51	
2011	966873.00	111271.00	3.21	99.13	19.14	
2012	1146250.00	117009.00	2.22	101.29	20.09	
2013	1353342.00	143073.00	2.21	102.27	20.12	
2014	1553128.00	162239.00	1.55	101.86	20.35	
2015	1786299.00	175987.00	1.59	101.01	19.51	

APPENDIX 2: CRITERIA GRAPH



APPENDIX 3: ARDL MODEL (1970-2015)

Dependent Variable: GDP

Method: ARDL

Date: 01/28/17 Time: 19:58

Sample (adjusted): 1975 2015

Included observations: 41 after adjustments

Maximum dependent lags: 5 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (5 lags, automatic): LOGEXP LOGFD LOGGD LOGINV

Fixed regressors: C

Number of models evalulated: 6480

Selected Model: ARDL(5, 1, 5, 1, 5)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	-0.702211	0.195495	-3.591964	0.0019
GDP(-2)	-0.544990	0.165975	-3.283567	0.0039
GDP(-3)	-0.196948	0.164660	-1.196091	0.2464
GDP(-4)	-0.324976	0.143669	-2.261980	0.0356
GDP(-5)	-0.200165	0.132409	-1.511718	0.1471
LOGEXP	-11.57303	18.73936	-0.617579	0.5442
LOGEXP(-1)	-21.45965	15.47753	-1.386504	0.1816
LOGFD	5.421099	1.499102	3.616230	0.0018
LOGFD(-1)	-4.027717	1.987601	-2.026421	0.0570
LOGFD(-2)	-0.416019	1.927693	-0.215812	0.8314
LOGFD(-3)	1.018017	1.709395	0.595542	0.5585
LOGFD(-4)	2.413602	1.802517	1.339018	0.1964
LOGFD(-5)	-1.556550	1.003681	-1.550842	0.1374
LOGGD	-16.71135	3.910595	-4.273351	0.0004
LOGGD(-1)	13.87102	4.041933	3.431780	0.0028

LOGINV	15.03646	3.422811	4.393014	0.0003
LOGINV(-1)	4.085534	3.991146	1.023649	0.3189
LOGINV(-2)	-6.401216	3.925863	-1.630525	0.1195
LOGINV(-3)	0.308610	3.521067	0.087647	0.9311
LOGINV(-4)	-3.220571	3.043969	-1.058017	0.3033
LOGINV(-5)	-5.438455	3.023842	-1.798525	0.0880
C	155.1397	80.56175	1.925724	0.0692

R-squared	0.874971	Mean dependent var	2.357769
Adjusted R-squared	0.736781	S.D. dependent var	2.212941
S.E. of regression	1.135347	Akaike info criterion	3.395791
Sum squared resid	24.49123	Schwarz criterion	4.315269
Log likelihood	-47.61371	Hannan-Quinn criter.	3.730614
F-statistic	6.331653	Durbin-Watson stat	1.794558
Prob(F-statistic)	0.000080		

*Note: p-values and any subsequent tests do not account for model selection.

APPENDIX 4: BOUNDS TEST

ARDL Bounds Test

Date: 03/07/17 Time: 15:52

Sample: 1975 2015

Included observations: 41

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	8.823039	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

APPENDIX 5: COINTEGRATION AND LONG RUN

ARDL Cointegrating And Long Run Form

Dependent Variable: GDP

Selected Model: ARDL(5, 1, 5, 1, 5)

Date: 02/06/17 Time: 12:03

Sample: 1970 2015

Included observations: 41

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	1.267080	0.362811	3.492396	0.0024
D(GDP(-2))	0.722089	0.299775	2.408772	0.0263
D(GDP(-3))	0.525141	0.206306	2.545453	0.0197
D(GDP(-4))	0.200165	0.132409	1.511718	0.1471
D(LOGEXP)	-11.573028	18.739360	-0.617579	0.5442
D(LOGFD)	5.421099	1.499102	3.616230	0.0018
D(LOGFD(-1))	0.416019	1.927693	0.215812	0.8314
D(LOGFD(-2))	-1.018017	1.709395	-0.595542	0.5585
D(LOGFD(-3))	-2.413602	1.802517	-1.339018	0.1964
D(LOGFD(-4))	1.556550	1.003681	1.550842	0.1374
D(LOGGD)	-16.711346	3.910595	-4.273351	0.0004
D(LOGINV)	15.036458	3.422811	4.393014	0.0003
D(LOGINV(-1))	6.401216	3.925863	1.630525	0.1195
D(LOGINV(-2))	-0.308610	3.521067	-0.087647	0.9311
D(LOGINV(-3))	3.220571	3.043969	1.058017	0.3033
D(LOGINV(-4))	5.438455	3.023842	1.798525	0.0880
CointEq(-1)	-2.969291	0.479340	-6.194546	0.0000

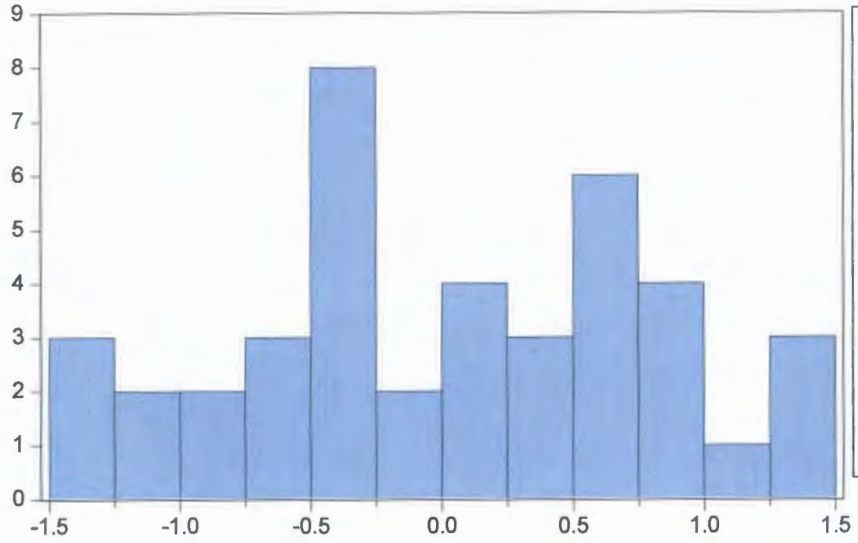
Cointeq = GDP - (-11.1248*LOGEXP + 0.9606*LOGFD -0.9566*LOGGD +

1.4719*LOGINV + 52.2481)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGEXP	-11.124770	6.550740	-1.698246	0.1058
LOGFD	0.960644	0.177775	5.403698	0.0000
LOGGD	-0.956566	0.251312	-3.806288	0.0012
LOGINV	1.471853	0.881072	1.670525	0.1112
C	52.248060	27.653338	1.889394	0.0742

APPENDIX 6: DIAGNOSTICS AND STABILITY TEST



Series: Residuals	
Sample 1975 2015	
Observations 41	
Mean	7.00e-14
Median	0.075214
Maximum	1.407214
Minimum	-1.497610
Std. Dev.	0.782484
Skewness	-0.067978
Kurtosis	2.036208
Jarque-Bera	1.618440
Probability	0.445205

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.949697	Prob. F(2,17)	0.4065
Obs*R-squared	4.120509	Prob. Chi-Square(2)	0.1274

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.855480	Prob. F(21,19)	0.6376
Obs*R-squared	19.92605	Prob. Chi-Square(21)	0.5259
Scaled explained SS	2.217060	Prob. Chi-Square(21)	1.0000

Heteroskedasticity Test: White

F-statistic	0.967096	Prob. F(21,19)	0.5324
Obs*R-squared	21.18266	Prob. Chi-Square(21)	0.4478
Scaled explained SS	2.356876	Prob. Chi-Square(21)	1.0000

Ramsey RESET Test

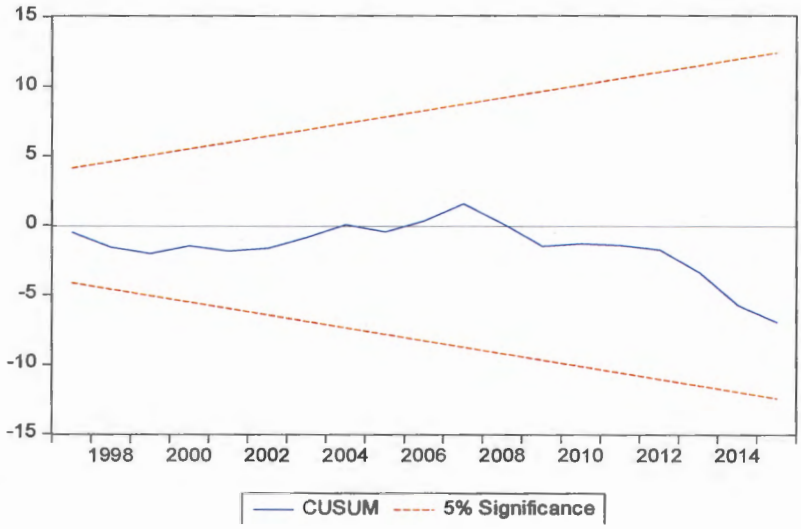
Equation: EQ05

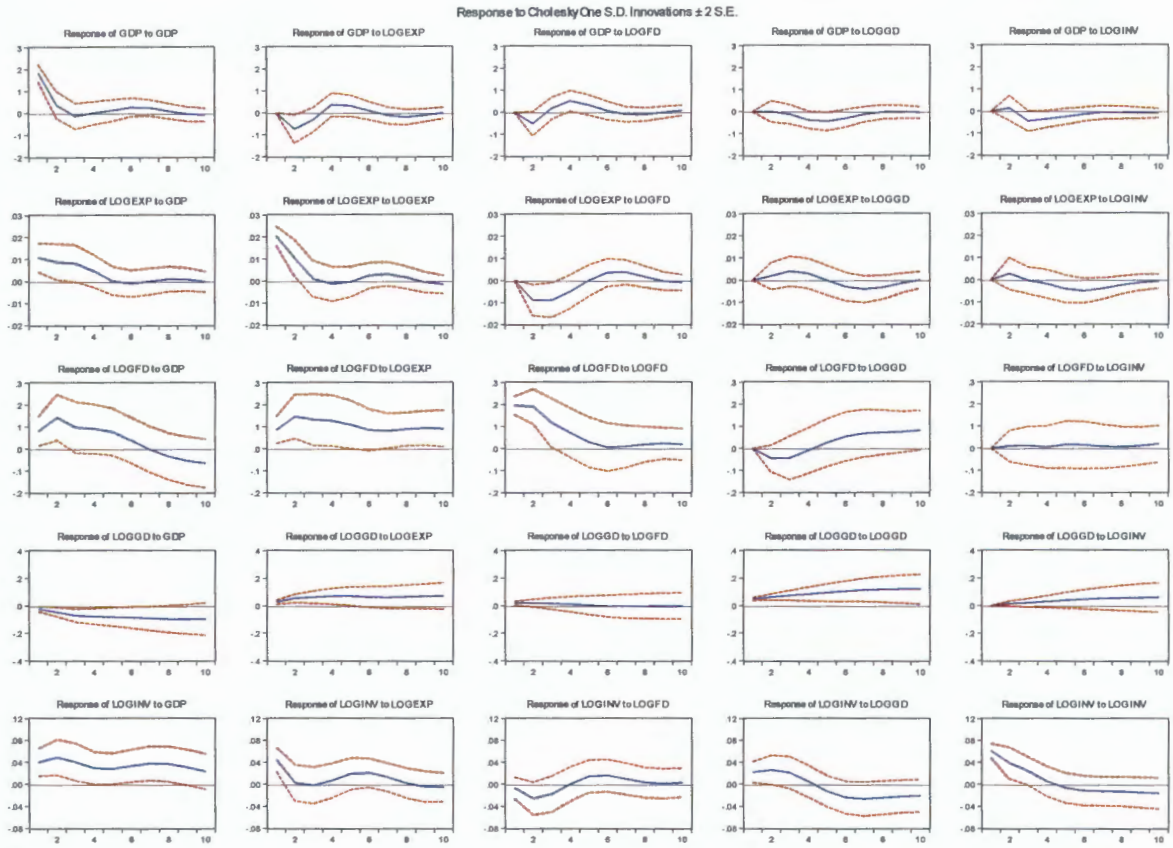
Specification: GDP GDP(-1) GDP(-2) GDP(-3) GDP(-4) GDP(-5) LOGEXP LOGEXP(-1) LOGFD LOGFD(-1) LOGFD(-2) LOGFD(-3) LOGFD(-4) LOGFD(-5) LOGGD LOGGD(-1) LOGINV LOGINV(-1) LOGINV(-2)

LOGINV(-3) LOGINV(-4) LOGINV(-5) C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.663354	18	0.5155
F-statistic	0.440039	(1, 18)	0.5155




Response to Cholesky One S.D. Innovations ± 2 S.E.
Response of GDP to GDP
Response of GDP to LOGEXP
Response of GDP to LOGFD
Response of GDP to LOGGD
Response of GDP to LOGINV
Response of LOGEXP to GDP
Response of LOGEXP to LOGEXP
Response of LOGEXP to LOGFD
Response of LOGEXP to LOGGD
Response of LOGEXP to LOGINV
Response of LOGFD to GDP
Response of LOGFD to LOGEXP
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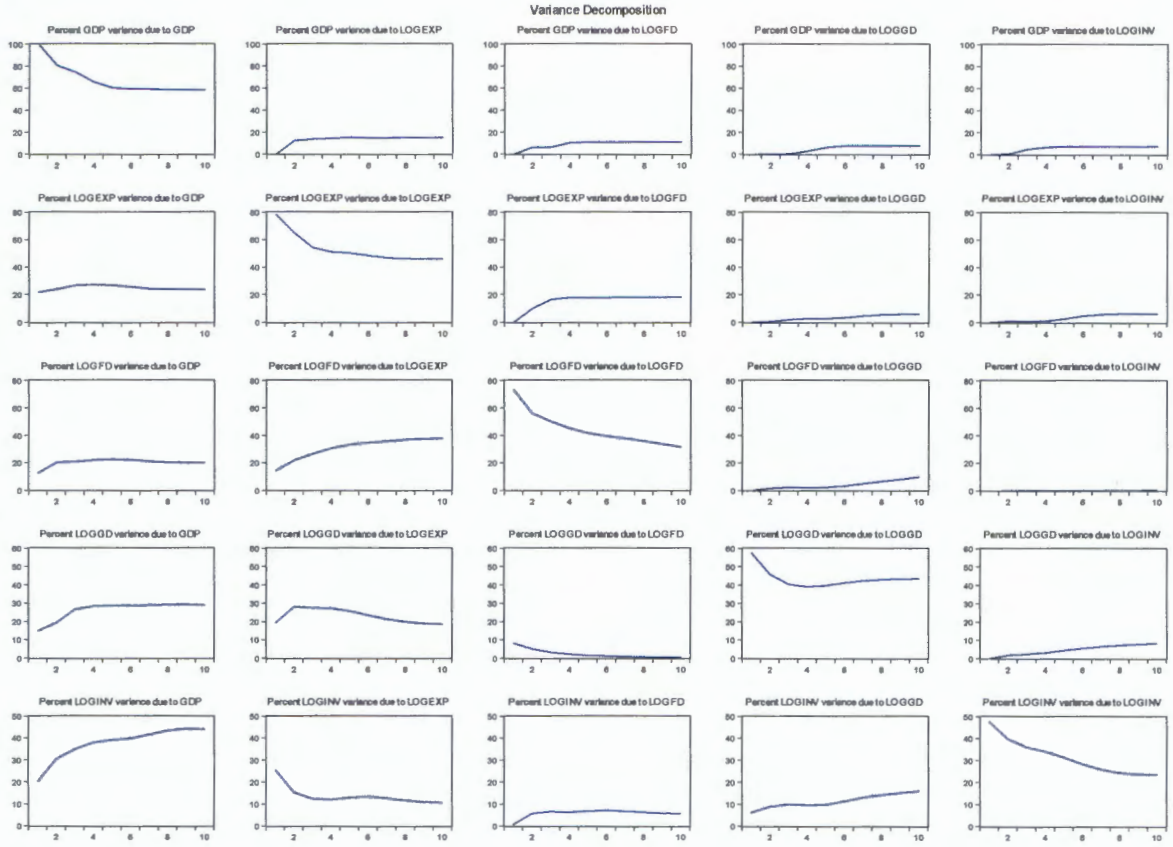
Response of LOGFD to LOGINV
Response of LOGGD to GDP
Response of LOGGD to LOGEXP
Response of LOGGD to LOGFD
Response of LOGGD to LOGGD
Response of LOGGD to LOGINV
Response of LOGINV to GDP
Response of LOGINV to LOGEXP
Response of LOGINV to LOGFD
Response of LOGINV to LOGGD
Response of LOGINV to LOGINV


Variance Decomposition
Percent GDP variance due to GDP
Percent GDP variance due to LOGEXP
Percent GDP variance due to LOGFD
Percent GDP variance due to LOGGD
Percent GDP variance due to LOGINV
Percent LOGEXP variance due to GDP
Percent LOGEXP variance due to LOGEXP
Percent LOGEXP variance due to LOGFD
Percent LOGEXP variance due to LOGGD
Percent LOGEXP variance due to LOGINV
Percent LOGFD variance due to GDP
Percent LOGFD variance due to LOGEXP
Percent LOGFD variance due to LOGFD
Percent LOGFD variance due to LOGGD
Percent LOGFD variance due to LOGINV
Percent LOGGD variance due to GDP
Percent LOGGD variance due to LOGEXP
Percent LOGGD variance due to LOGFD
Percent LOGGD variance due to LOGGD
Percent LOGGD variance due to LOGINV
Percent LOGINV variance due to GDP
Percent LOGINV variance due to LOGEXP
Percent LOGINV variance due to LOGFD
Percent LOGINV variance due to LOGGD
Percent LOGINV variance due to LOGINV