THE EFFECTIVENESS OF FISCAL POLICY ACTIONS ON ECONOMIC GROWTH: A VECTOR ERROR CORRECTION MODEL AND CAUSALITY ECONOMETRICS ANALYSIS OF SOUTH AFRICA

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DECLARATION

I, Nokuthula Vuluka hereby declare that I have the copyright to this mini-dissertation *"The Effectiveness of Fiscal Policy Actions on Economic Growth: A Vector Error Correction Model (VECM) and Causality Econometrics Analysis of South Africa"*, and all information used or quotation derived from this study are indicated with full acknowledgement through a comprehensive list of references. I further declare that this study has not been previously submitted to any other institution of higher learning for degree purposes.

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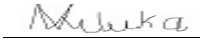
Signature: 

Date: 7 September 2020

DEDICATION

To my parents- **Rasnack Vuluka** and **Mercy Sitotombe**

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Predominately, I would like to give God Almighty all the glory for his infinite mercies, blessings and strength to pull through and complete my research.

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ABSTRACT

This study examined the effectiveness of fiscal policy actions in South Africa on economic growth. The investigation was carried out using both the descriptive statistics and VECM. The time-series data of the period 1990 to 2019 was employed in this study, to analyse the economic variables that included, economic growth rate (real Gross Domestic Product (GDP)), gross fixed capital formation, aggregate government expenditure, revenue and public debt. The presence of a long-run equilibrium relationship among variables was revealed in the VECM results. Government expenditure was found to have a negative and significant impact on economic growth. Meanwhile, the regression results of both public debt and gross fixed capital formation variables displayed favourable significant effects on economic growth in the long-run. Although government revenue showed a negative impact in the long run, the variable was found not to be statistically significant. Therefore, this current study recommends that the government of South Africa should avoid exploiting resources when spending on social consumption but concentrate more on directing these expenditures to improve production, technological development and infrastructure which increases investments, attracts tourists and ultimately, boosts economic growth.

KEYWORDS: Fiscal policy actions, Economic Growth, South Africa, VECM

CHAPTER ONE

INTRODUCTION

1.1) Background of the study

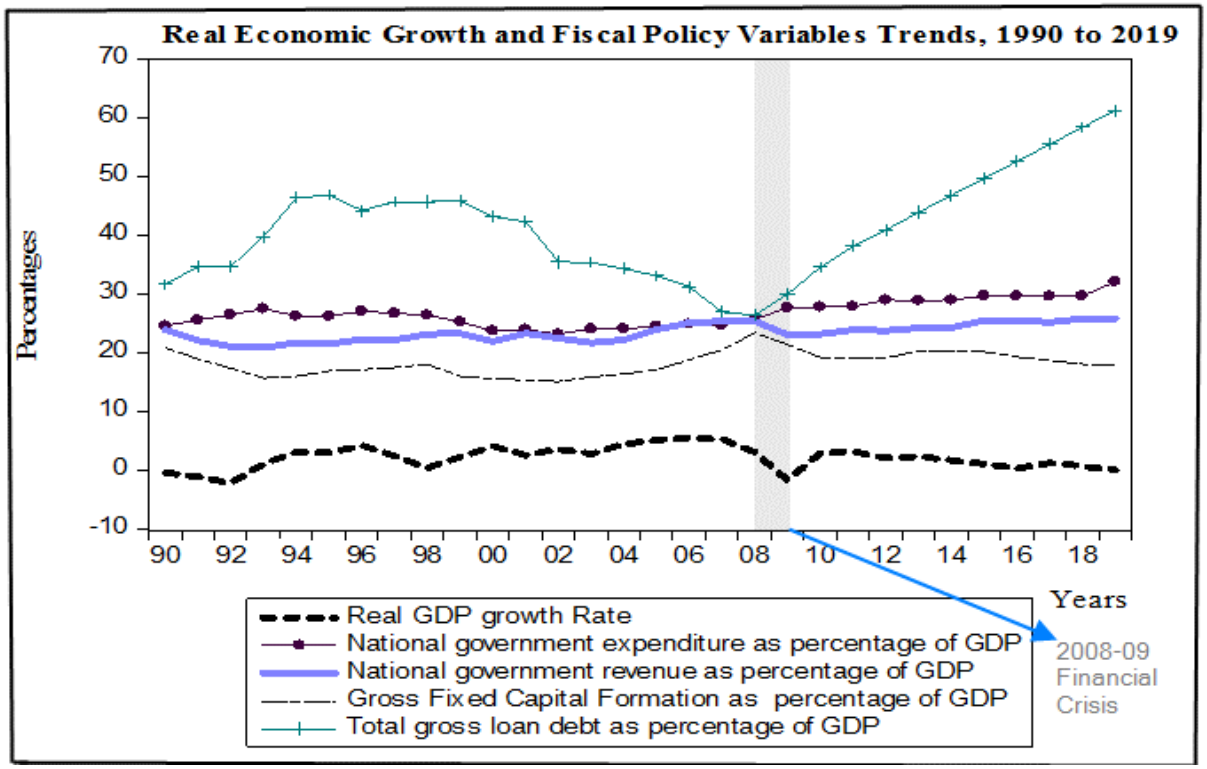
Fiscal policy remains one of the essential tools to facilitate the size of government spending, revenues and borrowings with the aim of achieving certain macroeconomic objectives (Makhoba, Kaseeram and Greyling, 2019). Its main purpose is to improve economic growth and social development by pursuing a policy stance that warrants a sense of stability between borrowing, spending and taxation (Al-Masaeed and Tsaregorodtsev, 2018; Al Gifari, 2015; Ocran, 2011). However, the extent to which the actions of fiscal policy engender the economic growth continues to attract both empirical and theoretical debate, particularly in emerging economies. The debate between scholars and policy-makers is still ongoing with agreements emerging but not persisting.

According to Chipaumire, Ngirande and Method (2014), in developing countries, such as South Africa, fiscal policy plays a significant role in both economic development and growth. The argument raised by Burger, Siebrits and Calitz (2015) was that before the 2008/09 global financial crisis, numerous developing countries, inclusive of South Africa, were able to improve government budget balances and managed their national debt relatively well. For instance, between 2006 and 2007, just two years before the global crisis, the South African government recorded its first budget surplus (Molefe and Maredza, 2017). This was a clear indication that the government was dedicated to serious effective budget formulation, processes and implementation with fiscal cautiousness.

Subsequent to the 2008/09 financial crisis, the fiscal policy position in South Africa worsened and resulted in increased government debt, due to the strong countercyclical policy response by the government, designed to enhance the aggregate demand (Burger *et al.*, 2015). It is

evident in Figure 1 below that government debt in South Africa has drastically increased from 23 per cent of GDP in 2008 to 45 per cent in 2015 as reported by the South African Reserve Bank (SARB) (2019). At the same time as government debt was increasing, the growth rate was deteriorating (Mhlaba and Phiri, 2019).

Figure 1.1: Real Economic Growth and Fiscal Policy Trends



Source: Researcher's computations using data from SARB.

Following the great recession of 2008, the fiscal policy in South Africa has been unsustainable with government expenditure growing way above revenue or the available resource envelope, translating to increasing government budget deficit. The growth rate also recorded a serious contraction during the financial crisis until the year 2010. It is, however, acknowledged in this study that the actions of fiscal policy did play a significant role in rebuilding the economy in South Africa during the recession period. As a result, it is without a doubt that fiscal policy remains one of the essential roles in improving the economy. Nevertheless, according to Molefe and Choga (2017), the government should limit its intervention to avoid crowding out of both the private sector investment and consumption.

The concern raised by the National Treasury (2018) through its publication of the Budget Review is that government expenditure is relatively above the average threshold. If it goes unchecked, it will slowly increase government dependency on borrowing and expose South Africa to macroeconomic imbalances e.g. unmanageable debt, high inflation rate, unemployment and poverty (Chipaumire, Ngirande and Method, 2014; Leeper, Walker and Yang, 2010; Mabugu, Robichaud and Maisonnave, 2013). The European sovereign debt crisis served as a clear reminder to developing countries about the macroeconomic risks posed by inadequate fiscal policy actions.

1.2) Problem Statement

Fiscal policy is widely acknowledged to be playing a vital role in supporting economic growth in both developed and emerging countries (Gray, Lane and Voroudakis 2007). Yet, the mismanagement of state resources and inadequate revenue collections remains a challenge in numerous countries. Moreover, governments in numerous countries have tendencies of allocating resource towards unproductive expenditures which do not necessarily yield good economic results. In the case of South Africa, government expenditure and debt levels have been increasing annually accompanied by an economy that is not growing. As a result, the gap between aggregate expenditure and government revenue continues to expand and pushes the government in the direction of borrowing (National Treasury, 2020).

According to the South African Reserve Bank (2020), between 2011 and 2018, the government of South Africa has been largely spending on general public services, compensation of employees and social protection rather than on productive investments such as infrastructural developments, mining, manufacturing, agriculture and construction. This is a clear indication that the government of South Africa is not yet able to formulate conducive policies that enable investment development and economic growth. Under the most optimistic assumptions, it is

difficult to see a significant economic growth rate in South Africa since public sector budgets are already constrained and the level of fixed capital investment is declining. Consequently, the downward phase of the business cycle continues to weaken due to the crowding out of the private investment, increasing political instability and the recessionary environment. Therefore, with this muted economic growth, the major challenges in the economy, such as high levels of inequality unemployment and poverty, are inadequately addressed.

Admittedly, increasing government spending from an already high fiscal deficit is not only associated with the risk of ever-augmenting debt levels but more specifically, the increasing inability of governments to finance these deficits, which is likely to affect the economy. This is because the rating agencies can downgrade the quality of government bonds leading to massive outflows of capital. For instance, during the early stage of the COVID-19 outbreak, the two international rating agencies downgraded South Africa to a sub-investment grade which is below the junk status (South Africa Shares, 2020). The downgrading followed after the unending acceleration of government debt and stagnant economic growth (South Africa Shares, 2020). These challenges make it difficult for the actions of fiscal policy to able to stimulate economic growth. It is, therefore, against this problem statement and background that this thesis seeks to empirically examine the effectiveness of South African fiscal policy and how it impacts economic growth, and advocate relevant recommendations.

1.3) The objectives of the study

In light of the above problem statement, the main aim of this study is to empirically examine the effectiveness of fiscal policy actions on the economic growth of South Africa. This aim is linked to the following specific objectives:

- To assess the diverse changes in the fiscal policy over the past three decades (1990 to 2019).

- To analyse the correlation between economic growth and fiscal policy actions using cross-correlation coefficients techniques.
- To analyse the short-run and long-run correlation between fiscal policy actions and economic growth in South Africa using VECM techniques.
- To assess how economic growth reacts to shocks coming from the selected fiscal policy indicators in South Africa through the employment of Variance Decomposition and Generalised Impulse response function.

1.4) Research questions

- Is there a long and short-run relationship between fiscal policy and economic growth in South Africa?
- Does economic growth react to shocks coming from fiscal policy indicators in South Africa?
- Does the causal relationship exist between fiscal policy indicators and economic growth in South Africa?

1.5) Significance of the study

This study is undertaken to examine the effects of fiscal policy actions on economic growth in South Africa. Moreover, to evaluates if the fiscal policy actions taken by the government of South Africa are growth-enhancing or detrimental. This study is significant since it will assist policy-makers who are aimed at improving the economic growth of South Africa. Furthermore, the study will contribute to the fiscal policy literature of South Africa which is less studied as compared to other fields. Lastly, it will give the government of South Africa some sense of direction in terms of fiscal planning and implementation.

1.6) Structure of the study

The remainder of this study is outlined as follows; Chapter 2 presents the literature review, which provides the discussion of various theories as well as the empirical literature that links the components of fiscal policy to economic growth. Chapter 3 is the research methodology which outlines the methods and the data used. Chapter 4 is the empirical results, followed by the concluding remarks in Chapter 5, which summarises the major findings of the study, policy implications and suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW

2.1) Introduction

In studying the effectiveness of the fiscal policy on economic growth, there have been various debates, theories and empirics proposed relating to the relationship between the fiscal policy and economic growth. This chapter reviews both the theoretical framework and the empirical literature done on the relationship between fiscal policy and economic growth.

2.2) Theoretical Framework

Fiscal policy actions are considered the most effective and significant tools in accelerating economic growth not only in developed countries but also in developing countries (Chipaumire, *et al*., 2014). In a developed country, fiscal policy is expected to maintain a smooth level of growth through economic stabilisation and stimulation of investment activity (Bobasu, 2015; Olukayode, 2009). Meanwhile, in emerging countries, fiscal policy is expected to increase research and development in the form of transport and communication facilities, reduce national disparities, increase education and training, develop social overheads, expand capital goods industries, and increase medical services (Karagöz and Keskin, 2015; Olukayode, 2009). However, the outcome always differs in every country, as some governments can possess certain deficiencies. This depends on the theory applied to that specific country relating to economic growth and fiscal policy.

The theoretical arguments on the relationship between fiscal policy actions and economic growth are predicated on four approaches - these are; Keynesian hypothesis, Wagner's law, Classical model and Ricardian theory.

2.2.1) Wagner's law

The debate concerning the direction of the causation between fiscal policy actions and economic growth received much attention after one of the influential economists, Adolph Wagner, published a book titled "*Grundlegung der Politischen Okonomie*", interpreted as *"Law of expanding states activity"* in English (Wagner, 1863). The book inaugurated what is known today as Wagner's law which recognised the positive association between fiscal policy actions and economic growth (Kamasa and Ofori-Abebrese, 2015). The law claimed that the changes in government spending are inevitable to the growth of the national income (Laihirushan and Gunasekera, 2015). That means the growth of the economy creates more costs to the government (Ansari, Gordon and Akuamoah, 1997). Further, enhanced economic growth is maintained by the growing demand for protective and regulatory functions (Al Gifari, 2015). In a nutshell, Wagner's law postulated that as the economy stimulates, a share of the country's public sector expenses also rises to cover the cost of the increased administrative, protective, cultural and educational functions of the state (Olukayode, 2009).

Wagner's law was based on three reasons. The first reason claimed that the extension of the function of states influences the public sector to take over the administration and regulation of the economy (Laihirushan and Gunasekera, 2015). Secondly, as the economy grows, there is need for advancing the cultural and social goods, and services which progresses the development of modern industrial society (Ali and Munir, 2016). The final reason is the government expenditure is needed more money to maintain the functional market forces and to manage and finance natural monopolies as the economy of the country grows.

However, Wagner's model suffered from various criticisms as mentioned by several authors (Bhatia, 2008; Dluhosch and Zimmermann, 2006; Likierman, 1988). One of Wagner's critics, Likierman (1988), claimed that the law did not put into question the ability and the willingness

of the government to deliver additional services in a growing economy. Meanwhile, Glaeser, La Portia, Lopex-de-Silanes, and Shleifer (2003) added the issue of corruption and inequality which is often associated with industrialisation.

2.2.2) Keynesian Model

Contrarily, the Keynesian model, popularised by John Maynard Keynes, had a different point of view concerning the direction of causation between fiscal policy and economic growth (Kamasa and Ofori-Abebrese, 2015). John Maynard Keynes through in his very classic book called *"The General Theory of Employment, Interest and Money"*, argued that an increase in public expenditure positively impacts the growth in the economy **(**Keynes,1936). The Keynesian ideas were brought to life during the great depression where there were low employment and economic growth. The assumption was if governments apply an expansionary fiscal policy during economic downturns, there is a reverse in the economic uncertainty as the aggregate demand also enhances (Laihirushan and Gunasekera, 2015; Iwegbunam, 2017). The Keynesian framework was mainly concerned with high levels of unemployment, low utilisation of resources and investments which occurred during economic downturns as a result of low aggregate demand.

According to Mose, *et al.* (2014), the Keynesian theory postulates that when there is full intervention from the government in the economy, through the multiplier effect on aggregate demand, the economy experiences full employment and price stability. That is, the economy is expected to experience full growth as the public spending in investment and productive activities increases (Mose, *et al*., 2014). Government expenditure is treated as autonomous and exogenously given (Ansari, *et al*., 1997). In a nutshell, the Keynesian theory suggests that through various spending programmes; such as education and training, health, infrastructure,

electricity and water supply which are part of productive expenditure, the country's economic growth is promoted (Iwegbunam, 2017).

The challenge rise when the government's expenditure in a country exceeds its revenues causing higher public debt to occur, leading to an undesirable fiscal policy stance (Mhlaba and Phiri, 2019). Nonetheless, the Keynesian argues when the government borrowing costs and spending is increased, it can also be reduced depending on the multiplier and hysteresis effects (DeLong and Summers, 2012). The theory claims that higher debt levels can simultaneously stimulate the growth of the economy when there is an expansionary fiscal policy in a country through the expenditure multiplier mechanism (Butkus and Seputiene, 2018).

However, this theory was based on the analysis that there are proper public debt management and well-designed strategies in a country which may end up reducing the borrowing costs and financial risk (Dombi and Dedak, 2019). Likewise, the endogenous growth model also clarifies that a positive effect to the economy from the public debt can occur if there is an investment subsidy on the side that covers a portion of the interest cost of capital (Ncanywa and Masoga, 2018).

2.2.3) Classical theory

On the other hand, the Classical theory stipulates that, although the expansionary fiscal policy may increase the economic growth through the multiplier effect, high debt levels may negatively influence economic growth (Tsoulfidis, 2007). The theory is based on the assumption that a high debt level negates the positive effects of public spending when it increases taxes, which results in lowering consumption, decreasing investment, and ultimately, reducing the growth of employment and the economy (Tsoulfidis, 2007). In a nutshell, Classical theory proved that the effectiveness of the fiscal policy in sustaining economic growth

and stabilising aggregate demand also depends on the level of crowding-out effect of government spending on private spending (Molefe and Maredza, 2017).

On the same note, the neoclassical model claimed that the increase of government expenditure and government debt lessens productivity in the country. This is because the cost of servicing the accumulated debt usually comes from taxes on future production (Dombi and Dedak, 2019). That means, instead of a country spending a significant portion of revenue on investment and keeping the economy stable, the revenue will now be spent on debt servicing (Shangai and Ochieng, 2019). As a result, this discourages investment and also lead to the crowding-out effect (Masoga, 2017; Hadhek and Mrad, 2014).

Moreover, the act of an increase in public debt and the run budget deficit is considered *"pernicious"* for the economy in Smith's book entitled the "*Wealth of Nations"*, (Smith, 1937). Smith argues that public debt itself in a country can rigorously affect the "natural progress and developments of the country towards wealth and prosperity" (Smith, 1937:674), even if all is owed to local investors (Tsoulfidis, 2007). Meanwhile, budget deficit can have undesirable consequences to the local interest rates when financed by dispensing domestic debt, as it crowds out private spending (consumption and investment) (Al Gifari, 2015; Molefe, 2016).

2.2.4) Ricardian theory

Nevertheless, the Ricardian theory suggests that fiscal deficit does not make a significant impact on the growth of the economy in both the long-run and the short-run. The theory articulated that the increase in demand due to the debt-financing of government consumption is counterbalanced by rising savings (Ncanywa and Masoga, 2018). The Ricardian paradigm claims that there are two ways that the government can compensate its spending without impacting economic growth. That is, they can either increase the present tax or fund their expenditure through borrowing money (and settling it in the long run through rising tax

considerably above the previous tax levels) (Eigbiremolen, Ezema and Oriji, 2015). Hence, due to the continual increase of tax in a country, the taxpayers become more conscious that they would have to save more in the prospect of higher tax payment leading the overall aggregate demand unaffected. Following the same logic as above, Barro (1989) argues that public debt and budget deficit does not influence the countries investment, savings and the overall country's economic performance.

2.3) An Overview of Fiscal Policy Actions and Economic Growth in South Africa

The issue of how fiscal policy impacts economic growth has remains a concern in both academia and policy-making. The causes and effects of an increase in aggregate government expenditure above government revenue, leading to a surge in public debt and budget deficit in a developing country, have been extensively debated in the past (Saungweme and Odhiambo, 2019). Moreover, the recent financial crisis that affected both emerging and developed economies reintroduced interest among development economists on the effectiveness of the fiscal policy on economic growth. This is because the post-financial crisis period saw an acceleration of the public debt and fiscal deficit levels at both national and international levels as government spending escalated above government revenue (Isibor *et al.*, 2018). As a result, this continues to affect developing countries that depend heavily on the fiscal policy, as economic growth and private investment are deterred (Masoga, 2017).

The fiscal mismanagement levels in South Africa were overwhelming during the period of the apartheid regime as the interest on public debt amounted to the largest budget deficit (Van den Heever and Adams, 2013). According to Van den Heever and Adams (2013), the African National Congress government inherited the economy of South Africa in complete disarray. The new South African regime was characterised by decolonisation and political liberation agendas (Hamilton and Viegi, 2008). Moreover, a process of extensive borrowing also featured the new regime as both the economic growth and development required attention (Hamilton

and Viegi, 2008). However, according to studies by Ncanywa and Masoga (2018); Mhlaba and Phiri (2019); and Molefe and Maredza (2017), after the country's transition into democracy, from the period of 1995 to 2003, the economic growth in South Africa had improved.

The transition was accompanied by the introduction of the Medium-Term Expenditure Framework programme (MTEF) (Molefe, 2016; Ocran, 2011). The MTEF carried programmes such as the tax reforms and administration capacity improvements. Hence, from the period 2004 to 2007, the economy of South Africa had grown substantially, and the fiscal policy was sustainable (Mabugu, *et al*., 2013). Moreover, during the same period, the economy of South Africa experienced its first budget surplus due to under-spending by governmental departments and large savings on debt servicing cost (Molefe, 2016).

Nevertheless, after 2008, the improved economy of South Africa was hindered by the global financial crisis (Molefe and Maredza, 2017; Burger, *et al.*, 2015). According to Steytler and Powell (2010), the impact of the 2008-09 financial crisis was enormous to the extent that on the South African economy went into a technical recession for the first time in 17 years. The government had to ensure that spending on social service did not decline to keep its economy functioning, despite the decreased tax revenue, due to the recession. The country's budget surplus reverted to a budget deficit as the government spending and the public debt increased. Markedly, from 2010 onwards, the fiscal situation in South Africa worsened.

Guaranteeing fiscal consolidation and recovering economic growth has been a challenge in South Africa (Burger, *et al.*, 2015). The economy faces undesirable fiscal trends due to the shocking continuous escalation of public debt (Mhlaba and Phiri, 2019). The economic recovery and the fiscal situation in South Africa are not only associated with high unemployment and poverty levels but also with high crime rates and income inequality. In spite of an unprecedented government social grants extension which assists in poverty mitigation

and vulnerability. Studies by Cheteni, Khamfula, Mah, Casadevall, and Ret (2019); Mabugu, *et al*. (2013); Nwosu and Ndina (2018), indicates that poverty remains high in South Africa, particularly among black Africans. Consequently, poverty is linked to poor education and inadequate health care facilities (Organisation for Economic Co-operation and Development (OECD), 2017). As a result, to mitigate inequality, unemployment and poverty, ambitious social reforms are being proposed.

2.4) Empirical Literature

The question of whether fiscal policy is growth-enhancing or detrimental to the economy has dominated the empirical debate for a long time (M'Amanja and Morrissey, 2005). Economists who have empirically investigated the link between fiscal policy actions and economic growth have not yet reached an agreement (M'Amanja and Morrissey, 2005). This is because some studies find the impact of fiscal policy actions (an increase of tax revenue, government borrowings and government expenditure changes) to have a significant positive effect on economic growth, depending on the countries under study. Meanwhile, other studies criticise the effectiveness of fiscal policy actions as they find the impact of the fiscal policy negative or even insignificant to some extent. The contradicting viewpoint finds the operations of the government to be inefficient and inherently bureaucratic. As a result, the operations stifle the economy rather than promoting growth. This section presents two subheadings of the empirical literature on fiscal policy and economic growth. The first section is on both developed and emerging economies, and the second section is on the economic growth of South Africa, the country in question.

2.4.1) empirical literature on developed and emerging economies

The effectiveness of the fiscal policy on economic growth shows a discrepancy depending upon the availability of resources in a country, productivity, the size of government, government regulations, and the level of public debt (Al-Masaeed and Tsaregorodtsev, 2018). Moreover, the impact of fiscal policy actions can also be different depending on whether the country is developing or developed.

Looking at the effectiveness of fiscal policy in developing countries, a study by Shafuda (2015) shows the positive significant impact of government expenditure in stimulating the economy. Using the annual data of 1980 – 2012 of Namibia through the VECM approach, the findings indicate that there is a long-run equilibrium relationship that exists between the government spending and economic growth in Namibia (Shafuda, 2015). Moreover, the findings of Shafuda (2015) displayed the importance of government intervention in the improving growth of the economy.

Another study conducted by Al-Masaeed and Tsaregorodtsev (2018) also considers the intervention of government as the foremost impetus for economic activity in the country. The study used Ordinary Least Squares (OLS) and Multiple Linear Regression (MLR) techniques to examine the impact of fiscal policy on the economic growth of Jordan. Variables used included public debt, government expenditure and government revenue. Al-Masaeed and Tsaregorodtsev (2018) found the employment of natural, economic and human resources to be influenced by high public expenditure, efficient production body and government revenue. As a result, the positive significant part that the fiscal policy plays in stimulating the economy is revealed in the study (Al-Masaeed and Tsaregorodtsev, 2018).

Similar to Al-Masaeed and Tsaregorodtsev (2018), Babalola and Aminu (2011) used time-series data of the period from 1977 to 2009 to examine the effect of fiscal expenditure and

revenue on economic growth in Nigeria. Both the Engle-Granger cointegration test and error correction test were adopted. The empirical findings revealed that productive government expenditure and distortionary fiscal revenue stimulates the long-run economic growth. The study showed the significance of fiscal policy in economic growth and recommended the use of productive expenditure such as health, education and economic services, to boost the growth of the economy (Babalola and Aminu, 2011).

According to Boiciuc (2015) and Bobasu (2015), the effectiveness of fiscal policy in stimulating economic growth gained momentum after the 2008/2009 financial crisis. This is because, during the global financial crisis, many countries across the world adopted expansionary fiscal policies which responded to the significant negative shocks to their economies (Boiciuc, 2015; Bobasu, 2015). Although there was a potential negative side effect of the fiscal stimulus (increased inflation), studies show that the fiscal policy was indeed effective at stimulating the output.

Auerbach and Gorodnichenko (2012) used the regime-switching technique to analyse the impact of the size of fiscal multipliers when the economy is in recession. Auerbach and Gorodnichenko (2012) found that fiscal policies that increase government purchase are more effective when applied in recession than during expansion. Moreover, when examining the economy of the United States of America, the authors' findings also indicated that government purchases had more impact on increasing the estimated multipliers of government spending during the recession. Moreover, a huge difference between the size of spending multipliers in the period of recession and the period expansion was spotted in the study, as the intervention of the government was considerably more effective in recessions than in expansions.

Similarly, Arin, Koray and Spagnolo (2015) estimated the magnitudes of government spending and tax multipliers to the United States’s economy (1949:01-2006:04). In their empirical

findings, Arin, *et al.* (2015) highlighted the importance the government spending multipliers during low economic activity. Moreover, the study found that the magnitudes of tax multipliers are more significant during periods of high economic activity than when there is lower economic activity. Their analysis showed that the effect of fiscal shocks on consumption and investment is minimal due to the magnitudes of government spending, taxes on consumption and investment (Arin, *et al*., 2015).

In the same year, Bobasu (2015) studied that impact of fiscal policy in emerging economies such as Romania, Poland and Hungary. The Bayesian VAR framework and the variables such as; real exchange rate, real GDP, government revenue, expenditure and GDP deflator, from the period of 2000:01 to 2014:03 were employed. The findings of the study highlighted that the ability for the government in Romania to stabilise the macroeconomics fluctuations was comparatively insignificant to the relatively small size of automatic stabilisers as compared to the other three emerging economies. In addition, the findings indicated that although economic growth can be impacted by the shocks of government expenditure and revenue, the response is a small one. Similarly, looking at the Romania economy, Boiciuc (2015) clarified that, although the fiscal multipliers are positive, they are also small in the emerging economies than in developed economies. In other words, with small fiscal multipliers, fiscal policy does not significantly influence the economic activity of emerging economies (Boiciuc, 2015).

In contrast, Afonso and Furceri (2010), examined the influence that of the size government and fiscal volatility have on economic growth in OECD and European Union countries. The main focus of the study was on combining both time series and cross-sectional series of seven five-year periods from 1970 to 2004 (for instance, 2000-2004). The results displayed the unfavourable effects of the volatile government revenue and the size of government expenditure on economic growth. Moreover, variables that include the size and the volatility of social contributions and indirect taxes, the size of subsidies, the volatility of government

investment and the total expenditure on expenditure had a sizeable, negative and statistically significant effect on growth.

The government in developing economies usually embarks on intensive borrowing and experiences high public debt when faced with economic challenges such as high unemployment, inflation and stagnant economic growth in their countries (Majam, 2017). However, some empirical studies show that countries with large persistent public debt face challenges of weakness in currency and credit downgrade, which ultimately affects that the investment and economic growth in the country (Ncanywa and Masoga, 2018; Mhlaba and Phiri, 2019). As a result, numerous studies have established that high public debt is unfavourable to economic growth (Woo and Kumar, 2015; Baum, Checherita-Westphal and Rother, 2013; Marchionne and Parekh, 2015).

Chen, Yao, Hu and Lin (2016) analysed the impact of government debt and investment in the economy, using nonlinear theoretical model and panel smoothing transitional regression (1991-2014). The panel data set included both 65 developed and underdeveloped countries. The empirical findings highlighted that the impact of government debt and government investment on economic growth is differs depending on the country under study. Chen *et al.* (2016), explained that in poor to middle-income countries the effectiveness of government investment on economic growth is positive. However, in high-income countries such as the members in OECD and European Union states the investments of the government showed a negative effect. Nevertheless, when it comes to public debt their findings indicated a positive impact of public debt on economic growth for upper-middle to high-income economies (non-OECD members), but a negative effect on economic growth for heavily indebted poor to lower middle income and high-income economies (OECD, EU member states).

In the same fashion, Ahlborn and Schweickert (2018) investigated the impact of public debt in developed and developing economies using panel data of 111 countries. The analysis focused on the long-run economic growth effects of public debt, government size, population growth and gross fixed formation on economic growth. Ahlborn and Schweickert (2018), findings revealed that growth debt differs between stages of development and institutional quality levels. This confirms that developing countries experience unfavourable economic effects on public debt. Meanwhile, when it comes to developed countries these negative effects vanish and sometimes turn positive.

In contrast, Chudik, Mohaddes, Persaran and Raissi (2017), studied how economic growth can be impacted with the long-run public debt expansion and whether there are changes of debt growth depending on the level of indebtedness. Chudik, *et al*. (2017) used the panel data of 40 countries, looking at both advanced and emerging economies, from the period of 1965 to 2010. The empirical results of the study did not find the significant impact of long-run public debt expansion on the growth of universal economies. According to the interpretations of Chudik, *et al*. (2017) "no evidence was found on the universal applicable threshold effect between public debt and economic growth relationship", when accounting for global factors and spillover effects. Moreover, Chudik, *et al*. (2017) went on to emphasise that a country with a high level of debt can grow at the same rate as its peers in the long-run provided that public debt is on a downward trajectory.

2.4.2) empirical literature in South Africa

Reviewing the empirical studies concerning the effectiveness of the fiscal policy on economic growth in South Africa remains a challenge as they are few studies compared to those on monetary policy. Moreover, most of them do not directly look at the impact of the components

of fiscal policy as a whole. As a result, the basis of this study analyses the effectiveness of fiscal policy actions on economic growth to minimise the empirical gap.

A study carried out by Mabugu, Robichaud, Maisonnave and Chitiga, (2013) examined whether expansive fiscal policy is constructive or detrimental to economic growth in long-run. Using forecast data from South Africa (2011-2025 forecast), Mabugu, *et al.* (2013) revealed that in the short run, expansive fiscal policy had a more substantial positive impact on economic growth than in the long run, as it would also translate into a higher debt-to-GDP ratio. Through the employment of an intertemporal computable general equilibrium model, the study also highlighted the negative and significant impact of indirect and direct taxation in financing government spending (reduces the short-run economic growth) (Mabugu *et al.*, 2013).

In the same year, Jooste, Liu and Naraidoo (2013) also analysed the effect of fiscal policy shocks in the economy of South Africa using time-varying parameter VAR and structural VECM techniques. The analysis was done to find if there were time variations and the potential asymmetries in aggregate government spending and taxes. The results of impulse responses confirmed Mabugu, *et al.'s* (2013) study as it also displayed a positive impact of the increase in government expenditure on GDP in the short-run. However, the high tax revenue was found to be hurmful on the GDP growth rate in the short-run. In a nutshell, the analysis proved that fiscal policy shocks are more favourable to the stimulation of both consumption and economic activities. Moreover, the implementation of an effective fiscal policy was found to have an influence on the size of the fiscal multipliers (Jooste, *et al*., 2013).

In another South African study by Makhoba, *et al.* (2019) used time-series data of the period of 1960 to 2017 to examine the short- and long-run impact of fiscal policy on economic growth in South Africa. Makhoba, *et al.* (2019) found evidence in the findings of the Johansen VECM approach that both government debt and public spending had a significant and minimal

influence on growth in the long-run relationship. However, the other components of fiscal policy used such as the gross fixed capital formation and government revenues were found to be growth-enhancing to the economy in the long-run.

2.5) Conclusion

Overall, the existing literature available on the relationship between fiscal policy and economic growth, to a greater extent, revealed that the actions of the fiscal policy could influence the economic growth positively or negatively in a country. However, this depends on the level of government expenditure and revenue, public debt and the level of growth rate in the economy. Moreover, the literature review also revealed that the effectiveness of the fiscal policy on economic growth works differently from country to country depending on the nature of development. Thus, the current study attempts to examine this causation in South Africa.

CHAPTER THREE

METHODOLOGY

3.1) Introduction

The purpose of this chapter is to provide a discussion of the framework methods adopted in this study. In this chapter, data description, research methodology and all the processes applied to analyse the effectiveness of fiscal policy actions on economic growth are discussed.

3.2) Model Specification

This study employs both the descriptive statistics and the vector regression analysis model (the Johansen VECM techniques). The model used in the study is adopted from Makhoba, Kaeeram and Greyling (2019) and it is specified as follows:

$$GDP = f(GE, TR, PD, GFCF) \quad (1)$$

Where:

GDP: the percentage change of annual real (GDP) (real economic growth rate),

GE: total government expenditure as a percentage of GDP,

TR: tax revenue as a percentage of GDP,

PD: total gross loan debt as a percentage of GDP,

GFCF: gross fixed capital formation as a percentage of GDP,

In the regression analysis, the study makes use of the stochastic model of VAR Framework, which is specified as follow:

$$GDP = \beta_0 + \beta_1 GE + \beta_2 TR + \beta_3 PD + \beta_4 GFCF + \mu_t \quad (2)$$

Following the VAR framework procedure, the multivariate cointegration methodology (the Johansen test) is employed and it is analysed as follows:

$$GDP_t = \beta_0 + \beta_1 GE_t + \beta_2 TR_t + \beta_3 PD_t + \beta_4 GFCF_t + \mu_t \quad (3)$$

Following the multivariate cointegration methodology process, the equation (3) is converted into VEC form, which is specified as follows:

$$\Delta GDP_t = \beta_0 + \beta_1 \Delta GE_{t-1} + \beta_2 \Delta TR_{t-1} + \beta_3 \Delta PD_{t-1} + \beta_4 \Delta GFCF_{t-1} + \xi_{t-1} + \mu_t \quad (4)$$

Where Δ represents difference operatives and ξ_{t-1} are derived from the long-run Cointegration association, which is also used to apprehend the dynamics in the short-run; it represents the lagged significance of the error term.

A priori, it is expected that the increase of government expenditure and gross fixed capital formation is likely to positively influence the growth of the economy. The expectation is based on the views of the Keynesian framework that assumes that an increase in government expenditure helps to improve the growth through the injection of purchasing power into the economy through standard demand theory. That is, as they supply pure goods that constitute a sizable component of aggregate demand, more equitable society is created through the occurrence of income taxes and payments transfer which affects the income distribution (Poot, 2000; Shafuda, 2015). As a result, this leads the economic growth to be stimulated. Furthermore, a positive direct link is expected between gross fixed capital formation is and economic growth. This is because the economy needs new investment represented by net additions to the capital stock for it to continuously grow (Todaro and Smith, 2015).

On the other hand, the study suspects the increase of government revenue to influence the growth of the economy of South Africa negatively. This is based on the assumption that lowering the returns on the earning income have disincentive effects of working, saving and investing. As a result, this leads the economy to contract as the private sectors' activities are discouraged through the crowding-out effects (Magu, 2013). Moreover, in terms of public

debt, the study suspects an adverse correlation between economic growth and government as stated in both classical and neoclassical theory (Shangai and Ochieng, 2019; Tsoulfidis, 2007).

3.3) Data Source

This study employs time series data spanning the period 1990 to 2019 collected from the South African Reserve Bank. Variables such as economic growth rate, government expenditure, tax revenue, public debt and gross capital formation are used to assess the relationship in question.

3.4) Estimation Techniques and conclusion

This study makes use of both descriptive statistics and a Vector Error Correction Model (VECM) econometric approach to assessing the relationship between fiscal policy actions and economic growth in South Africa. The section of descriptive analysis involves the summary of the description, a comparison of 5 years period average of trends in fiscal policy variables and GDP, the cross-correlation coefficients of the fiscal policy components to GDP. Nevertheless, the study's primary mode of the empirical investigation was the VECM technique which examines the short-run and long-run relationships. The VECM technique comprises the following process:

3.4.1) Testing for Stationarity

The Vector Error Cointegration Model treats all variables as endogenous and necessitates the importance of estimating the variables with the same order. The Augmented Dickey-Fuller (ADF) and Phillip-Perron unit root test are used in this study to determine the order of integration. If it occurs that the variables that being assessed have unit root or non-stationary at levels, the study proceeds to test the variables at the first- or second difference. The following formula is applied to test for stationarity using the ADF test:

$$\Delta Y_t = \alpha + \beta t + \delta Y_{t-1} + \sum_{i-1}^{n} \lambda \, \Delta Y_{t-1} + \varepsilon_t \qquad (5)$$

The ADF hypothesis test through the AR (ρ) process is specified as follows:

Null Hypothesis: $\delta = 1$ implies that the variable has a unit root; meanwhile, the alternative hypothesis: $\delta < 1$, which implies that the variable does not have unit root (stationary). Moreover, to check the robustness of ADF findings, Phillip-Perron unit root test is performed.

3.4.2) Lags Length Selection Criterion

Although numerous criteria can be employed to determine the suitable lag order for cointegration tests such as Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Information Criterion (HIC), the study employs of the FPE and AIC criteria. This is because, according to Liew and Chong (2004), the FPE and AIC criteria are more reliable in a study with sixty and fewer observations, hence this study make use of these criteria.

3.4.3) Cointegration Test and Johansen Procedure

The study employs the cointegration test to assess the long-run association between fiscal policy actions and real GDP growth. There are two recognised methods used to determine the long-run relationships and assess the cointegration of unit root series; these procedures are Johansen Maximum Likelihood Estimation process and Engel-Granger two-step approach. Nevertheless, the study only make use of the Johansen Maximum Likelihood Estimation approach due to the number of advantages over the Engle-Granger approach (Molefe, 2016). In other words, the Johansen Maximum Likelihood Estimation approach is not only able to test multiple cointegrating vectors but also permits the testing of the speed of adjustments parameters and cointegrating vectors in both restricted and unrestricted forms.

Moreover, the cointegration test is employed in this study to incorporate the long-run and short-run relationship through the error correction term among variables as well as to improve long-

run forecast accuracy. There are two tests to this procedure of finding the number of cointegration vectors which are “the trace test” and “the maximum eigenvalue statistic test”, and they can be conducted using the following equations:

$$\lambda_{trace}(r) = -T\sum_{i=r+1}^{n} \ln(1-\widehat{\lambda_i}) \quad (6)$$

$$\lambda_{max}(r, r+1) = -Tln(1-\widehat{\lambda_{r+1}}) \quad (7)$$

Equation 6 and 7 represents the trace test and the maximum eigenvalue statistic test, respectively. T is the number of the observation, λ represents the ith primary canonical correlation and r is the number of the cointegrating vectors. Moreover, the cointegrating VAR equation is transformed into a VECM equation which allows this study to estimate a VECM model. Nevertheless, the Johansen and Juselius (1988) cointegration test is the first technique to be used to determine the number of cointegrating variables associated in the VECM equation. This is because the VECM specification only applies to cointegrated variables. The Johansen and Juselius (1988) cointegration test approach is quantified as follows:

$$\Delta Y_t = \prod Y_{t-1} + \sum_{i=1}^{p-1} \Gamma i \Delta_{t-1} + \beta_{xt} + \mu_t \quad (8)$$

Where, Π is the number of cointegrating vectors or coefficient matrix, Y_t represents K vector of non-stationary variables; β shows the long-run relationships between cointegrating vectors; meanwhile Γ capture the short-run dynamics adjustments and X_t represent the vector of the deterministic variables.

Subsequent to the Johansen and Juselius (1988) cointegration test, the VECM approach can be applied as follows:

$$\Delta Y_t = \mu + \Gamma\Delta Y_{t-1} + \ldots\ldots\ldots + \Gamma_{k-1}\Delta Y_{t-k+1} - \Pi\Delta Y_{t-1} + \mu_t \quad (9)$$

Equation 9 represents the VECM approach, as the Vector of Impulses (represents itμ_t) which is the unforeseen measure in the non-stationary variables. In addition, estimated parameters are represented by Γ and Δ are the difference operatives.

It is important for this study to employ the VECM model when analysing two series that are cointegrated at the same order of integrations because the model helps in administrating the collective performance of the series in a dynamic system (Engle and Granger, 1987). In other words, there should be at least one cointegrating relationship between the variables for a long-run relationship to be analysed.

3.5) Diagnostic Tests

The study makes use of the diagnostic tests together with the stability test to verify the validity and robustness of the estimated model. The following tests are specified as follows:

3.5.1) Serial Correlation Test

Serial correlation test is one of the important tests that can be used to confirm if the model estimated is appropriately specified. This study used the Breusch-Godfrey LM test to test for serial correlation because it offers substantial results as higher-order serial correlation is taken into consideration.

3.5.2) Normality test

One of the assumptions on the Classical Linear Regression Model is that the *variance* is constant with zero *mean* when it is normally distributed. This study make use of the Jarque-Bera test to confirm the normality of residuals. This can help the study to identify if is there is any misspecification problem**.** The Jarque-Bera normality test is quantified using the following equation:

$$JB = n\left[\frac{\mu_3^2}{6} + \frac{(\mu 4-3)2}{24}\right] \quad (10)$$

The null hypothesis states that jointly the error terms are normally distributed and at a 5% level of significance and above the study fails to reject the null hypothesis.

3.6) Granger Causality test

The Pairwise Granger Causality test is employed in this study to analyse the direction of the causality between the real GDP growth rate and the fiscal policy's indicators. In other words, the analysis of the Granger test is used to assess if there is any bidirectional or unidirectional causation that exists between real growth rate and the variables of fiscal policy. The hypothesis used in the Granger test is as follows:

$Null\ Hypothesis$: x_t $does\ not\ Granger\ cause$ y_t
$Alternative\ Hypothesis$: x_t $does\ Granger\ cause$ y_t

3.7) Variance Decomposition (VD) Test and Generalised Impulse Response Function (GIRF)

Finally, both VD and GIRF tests are employed in the study to trace the time path of the variables in numerous shocks and, further to assess the behaviour of the series and the significance of various fiscal policy shocks to GDP growth rate.

3.8) Conclusion

This chapter was aimed at explaining the methodology used in the study. The study employs the post-democratic annual time series data as it is applicable for this study. Both the descriptive statistics and VECM techniques are chosen to examine the effectiveness of fiscal policy variables on economic growth and the long-run and short-run association between economic variables. All analyses are performed in chapter 4.

CHAPTER FOUR

ANALYSIS OF EMPIRICAL FINDINGS

4.1) Introduction

This chapter responds to the main question raised in this current study of how fiscal policy actions affect the economic growth of South Africa. To ensure that all the questions raised in this study are answered, this chapter employed both the descriptive statistics and the regression analysis model (the VECM techniques). The VECM techniques include testing all variables for stationarity using ADF and PP techniques, testing for cointegration using Johansen technique, VECM estimation and other diagnostic tests to validate the results. Moreover, Pairwise Granger Causality test; and Impulsive Response Function test are analysed.

4.2) Descriptive Statistics: Overview of Fiscal Performance in South Africa

This study firstly generated the time series of real GDP growth rate and fiscal policy into a summary of descriptive statistics. The descriptive statistics table includes the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, the Jarque-Bera and probability of GDP, government expenditure, government revenue, public debt and gross fixed capital formation. Table 4.1 (a) presents the results of the summary of descriptive statistics for the time series employed.

Table 4.1 (a) results display an average of 2.227% on the economic growth of South Africa, reaching a maximum of 5.6 % in 2006. Meanwhile, it also records its minimum of a negative 2.1% on the economic growth in 1992. Moreover, basing on the commonly stipulated policy programmes, the study also noticed that the real GDP growth rate averages are even lower than the inflation rate of South Africa. The average government expenditure is higher than the revenue and has reached a maximum of 32.20% whilst the revenue is 25.90%.

Table 4.1(a). Summary of Descriptive statistics

	GDP	GE	GR	PD	GFCF
Mean	2.227	26.84	23.57	41.278	18.297
Median	2.550	26.550	23.400	41.700	18.150
Maximum	5.600	32.200	25.900	61.365	23.500
Minimum	-2.100	23.300	21.000	26.510	15.200
Std. Dev.	2.009	2.256	1.522	8.971	2.049
Skewness	-0.305	0.369	0.063	0.369	0.421
Kurtosis	2.476	2.310	1.786	2.503	2.649
Jarque-Bera	0.809	1.277	1.863	0.990	1.039
Probability	0.667	0.528	0.394	0.609	0.595

Table 4.1(a) also indicates that public debt has a relatively highest standard deviation of 8.97% compared to other components of fiscal policy. This showed that from 1990 to 2019, public debt has been volatile. On the same note, the results also reveal that public debt had the highest mean of 41.28% on overall. Table 4.1 (a) and displays the continual upsurge in public debt, reaching the maximum 61.37% of GDP in 2019. Lastly, gross fixed capital formation has averaged 18.3% as a share of GDP with a maximum of 23.5% and a minimum of 15.2%. The statistics are shown in Table 4.1 (a) shows that the actions of the South African fiscal policy have been erratic, as the averages in GDP, GE, GR, PD and GFCF shows low economic performance, lower government investments than government expenditure and high public debt.

Based on the above descriptive analysis, the next step was to assess the diverse changes of the fiscal policy over the past three decades. The study used the five-year average period of trends in fiscal policy and economic growth. Table 4.1 (b) shows the summary of periodic averages on the trends in fiscal policy and economic growth.

Table 4.1 (b): Summary of periodic averages on the trends in Fiscal policy components and Real GDP growth rate, 1990-2019

Period average	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014	2015-2019
GDP growth rate	0.2	2.58	3.62	3.6	2.56	0.8
As a percentage of GDP						
GE	26.2	26.44	23.92	25.6	28.62	30.26
GR	22.04	22.6	22.42	24.7	23.98	25.68
PD	37.514	45.758	38.218	29.644	40.96	55.574
GFCF	17.88	17.2	15.76	20.34	19.68	18.92

It is evident from Table 4.1 (b) that there have been diverse changes in fiscal policy over the past three decades. For instance, after the year 1994, the average GDP growth rate was stable, as it increased marginally ranging around 3%. However, after the 2008-09 financial crisis, the trends of GDP growth rate of South Africa declined undeniably to the extent that the average of GDP growth rate in the period of 2015 to 2019 is not significant.

On the other hand, the five-year average period of government expenditure has generally increased at a higher rate than the government revenue reaching to 30.26%, from 2015 to 2019. Table 4.1 (b) also indicated that although government expenditure and revenue declined between the year 2000 and 2004, on overall, there has been a continual increase. It is worth noting that, following the end of apartheid in 1994, the government has been providing social grants (such as foster care grants, child support and old-age pensions) and spending on wages and non-wages (education and health). Although in the long-run, these positive welfare implications might bring an optimistic favourable effect on economic growth, consumption expenditure is perceived as unproductive to the growth of the economy (Ocran, 2011).

Table 4.1 (b) revealed that after the year 2000, the government regulations were able to stabilise the public debt, after its drop from 45.758% in the average years of 1994 to 1999. Nevertheless, after the 2008-09 global crisis, the trends of public debt as a percentage of GDP shows that a

continuous upsurge is reaching 55.574% from 2015 to 2019. However, when the study considers the gross fixed capital formation, Table 4.1(b) revealed that fiscal management has been investing at a lower level than it has been spending. Although the five-year average period of 2005 to 2009 shows that the gross fixed capital formation peaked to 20.34%, the table shows that the investments averaged below 20%.

Moreover, the study extends the descriptive statistics analysis by also investigating the correlation between the real GDP growth rate and the components of fiscal policy. The study calculates the cross-correlation coefficients of the time series using the same method as Burger (2010) used. Importantly, the cross-correlation indicates the sequence of change as it reveals the leads and lags of real GDP growth rate and each variable of fiscal policy actions (GE, GR, PD and GFCF). Table 4.2 displays the results of the cross-correlation coefficients in time.

Table 4.2: Correlation coefficients of the Fiscal Policy Components

The correlation coefficient of cross-correlation with Real GDP in time t											
GDP	**t-5**	**t-4**	**t-3**	**t-2**	**t-1**	**t**	**t+1**	**t+2**	**t+3**	**t+4**	**t+5**
GE	-0.38	-0.41	-0.40	-0.34	-0.33	-0.45	-0.38	-0.25	-0.21	-0.09	-0.01
GR	-0.14	-0.31	-0.40	-0.41	-0.25	0.03	0.26	0.27	0.22	0.20	0.26
PD	0.01	-0.14	-0.18	-0.12	-0.12	-0.25	-0.34	-0.44	-0.47	-0.37	-0.28
GFCF	-0.30	-0.32	-0.42	-0.51	-0.53	-0.24	0.20	0.41	0.41	0.30	0.17

Note: the time t-5 to t-1 represents the leads, time t+1 to t+5 represents the lags, "t" on its own represents the existing period

Table 4.2 shows the correlation coefficients between the real GDP growth rate in time t and components of fiscal policy (GE, GR, PD, and GFCF). The grey shaded figures display the correlations coefficients that are statistically significant at 5% level. As observed in Table 4.2 the relationship between the real GDP and government expenditure seems to be absent in the first and second leads (t-1 and t-2), but later on, the third lead shows a negative correlation. On the contrary, when it comes to the relationship between the real GDP growth rate and government revenue, although the second and third leads seemed to be negatively statistically

significant, the majority of leads and lags of the government revenue were not statistically insignificant.

Moving on to public debt, the relationship between economic growth and public debt display a negative, weak correlation at the second to fourth lag (t+2 to t+4). Lastly, Table 4.2 indicates that the leads (t-1 to t-3) coefficient of gross fixed capital formation seems to be stronger than the lags (t and t+1). Significantly, the first to third lags (t-1 to t-3) of gross fixed capital formation showed a negative impact. However, the table also shows that the first and second leads (t+1 and t+2) of gross capital formation has a positive effect on economic growth.

In the following section, the study extends the summary of descriptive statistics and the cross-correlation analysis by also estimating on VECM and variance decomposition to establish the contribution that the fiscal policy components make to sustain the economy.

4.3) VECM modelling estimates

4.3.1) Stationarity test

For modelling estimates to be established, this study first examined the properties of time series data to avoid problems associated with spurious regression. This was done by analysing the stability of the mean and variance using the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test. As discussed in chapter 3, the purpose of testing the unit root test using the ADF test and the PP test is to examine the order of integration. GDP growth rate, government expenditure, government revenue, public debt and gross fixed capital formation are the variables employed in the ADF and the PP approach.

Table 4.3: Estimated results for unit roots test from ADF and PP test at levels and first difference

Series	Model	ADF		PP		Order of integration I(d)
		Level *t-statistic (P-value)*	**Differences** *t-statistic (P-value)*	**Level** *t-statistic (P-value)*	**Differences** *t-statistic (P-value)*	
GDP	intercept	**-2.704* (0.086)**	**-5.744*** (0.000)**	**-2.586 (0.107)**	**-6.377*** (0.000)**	***I(1)***
	Trend and intercept	-2.59 (0.287)	-5.572*** 0.001	-2.232 (0.456)	-13.695*** 0.000	
	None	-1.624* (0.097)	-5.85*** (0.000)	-1.604 (0.101)	-6.532*** (0.000)	
GE	Intercept	**0.176 (0.966)**	**-3.985*** (0.005)**	**0.026 (0.954)**	**-3.928*** (0.006)**	***I(1)***
	Trend and intercept	-0.699 (0.964)	-6.369*** (0.000)	-0.817 (0.952)	-4.219** (0.013)	
	None	1.597 (0.97)	-5.934*** (0.000)	1.488 (0.963)	-3.698*** (0.001)	
GR	Intercept	**-1.313 (0.61)**	**-5.269*** (0.000)**	**-1.313 (0.61)**	**-7.5*** (0.000)**	***I(1)***
	Trend and intercept	-4.033** (0.019)	-5.138*** (0.002)	-4.037** (0.019)	-7.115*** (0.000)	
	None	0.296 (0.765)	-5.269*** (0.000)	0.370 (0.785)	-5.521*** (0.000)	
PD	Intercept	**-0.72 (0.826)**	**-2.845* (0.065)**	**-0.584 (0.854)**	**-2.813* (0.069)**	***I(1)***
	Trend and intercept	-0.965 (0.933)	-3.010 (0.147)	-0.813 (0.953)	-2.911 (0.174)	
	None	0.706 (0.862)	-2.723*** (0.008)	1.114 (0.927)	-2.667*** (0.0096)	
GFCF	Intercept	**-2.46 (0.136)**	**-3.586** (0.013)**	**-2.108 (0.243)**	**-3.411** (0.019)**	***I(1)***
	Trend and intercept	-2.954 (0.162)	-3.474* (0.062)	-2.494 (0.328)	-3.236* (0.098)	
	None	-0.657 (0.424)	-3.663*** (0.001)	-0.608 (0.445)	-3.527*** (0.001)	

Notes: (*) denotes the level of significance at the 10% level, (**) denotes the level significance at 5% level, (***) denotes the level of significance at 1% level.
Source: Author's calculation for E-views 10

The ADF and the PP tests shown in Table 4.3 are conducted using the equations that included intercept, trend and intercept and none models. Nevertheless, this study only focused on the results of the intercept models. The stationarity is determined by looking at the significance of the p-values and the t-statistic values. Hypothesis testing is specified as follows:

H_0: $The\ time\ series\ has\ unit\ root\ (non-stationary)$
H_1: $The\ time\ series\ has\ no\ unit\ root\ (stationary)$

The procedure is applied to assess if the series of the variables in the study are integrated at order-level I (0) or the first difference I (1). It is then evident from Table 4.1 that the variable was not stationary at levels 1%, 5% and 10% level of significance. This simply implies that GE, GR, PD and GFCF variables have random walk stochastic components present. Therefore, an attempt to make use of the series at a level will cause inefficient and spurious estimations. Thus, this necessitated the study to test all variables at first difference. Both ADF and PP results were in agreement that all variables are stationary at the first difference, meaning that all variables are integrated as the same order of integration I (1).

4.3.2) Lag Length Selection Criterion

Table 4.4: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-288.7850	NA	893.7338	20.98464	21.22253	21.05737
1	-174.0040	180.3701*	1.515982*	14.57172*	15.99908*	15.00807*
2	-158.8201	18.43767	3.693763	15.27286	17.88969	16.07285

NOTE: Asterix (*) indicates lag order selected by the criterion, LR: sequentially modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

The unit root tests revealed the possibility of a long-run equilibrium among series. Hence, this triggers the study to test for cointegration in the long-run using the Johansen methodology. It is, however, important when using the Johansen methodology first to conduct a lag length selection criterion that will select the number of lags to be used to avoid misspecification of results. Tables 4.4 shows the results of the VAR lag order selection criteria. Based on LR, FPE,

AIC, SC, HQ tests, lag 1 was selected and was used to assess the long-run equilibrium relationship between variables under study. The Johansen cointegration results as presented in Table 4.5, relied on the assistance of the famous tolls of Trace test and Maximus Eigenvalue test statistics. Using 1 lag length, the empirical results of both trace and maximum eigenvalue tests show that there are at least one cointegrating vectors between GDP growth rate, government expenditure, government revenues, public debt and gross fixed capital formation.

Table 4.5 Johansen Cointegration Test results

Trace test				**Maximum Eigenvalue test**			
Hypothesized No. of CE(s)	**Trace statistics**	**0.05 Critical Value**	**P-value***	**Hypothesized No. of CE(s)**	**Max statistics**	**0.05 Critical Value**	**P-value***
None *	***90.46862***	***69.81889***	*0.0005*	None *	***42.95043***	***33.87687***	*0.0032*
At most 1	***47.51819***	***47.85613***	*0.0538*	At most 1	***26.85146***	***27.58434***	*0.0618*
At most 2	***20.66674***	***29.79707***	*0.3787*	At most 2	***13.16751***	***21.13162***	*0.4370*
At most 3	***7.499223***	***15.49471***	*0.5204*	At most 3	***7.253037***	***14.26460***	*0.4596*
At most 4	***0.246186***	***3.841466***	*0.6198*	At most 4	***0.246186***	***3.841466***	*0.6198*
Trace test indicates 1 cointegrating equation(s) at the 0.05 level ****denotes rejection of the hypothesis at 0.05 level***				***Max-eigenvalue test indicates 1 cointegrating equation(s) at the 0.05 level*** ****denotes rejection of the hypothesis at 0.05 level***			

Based on the Trace test and Maximum Eigenvalue test statistics, this study rejects the null hypothesis of no cointegration of $r = 0$. This study, therefore, concluded that there exist at least 1 cointegrating equation amongst variables at a 5% level of significance.

4.4) VECM Estimates Findings

Bearing in mind that the empirical results from the cointegration test above prove the existence of a long-run relationship among the variables, the next move in this empirical analysis is the estimation of a correction model. This is done to assess the long-run and short-run equilibrium

effects of fiscal policy indicators on the economic growth of South Africa. The VECM long-run results are presented in Table 4.6 as follows:

Table 4.6: Long-run results: GDP

GDP (-1)			
Variable(s)	**Coefficient**	**Standard Errors**	**t-statistics**
GE (-1)	*-11.353*	*1.342*	*-8.460*
GR (-1)	*-1.803*	*1.083*	*-1.665*
PD (-1)	*2.060*	*0.285*	*7.22*
GFCF (-1)	*7.026*	*1.265*	*5.553*

The empirical results in Table 4.4 indicate that government expenditure negatively impacts the growth of the economy in the long run. That is to say, if other variables were constant, a 1% increase in GE (government expenditure) would lead to an 11.35% reduction in GDP (the growth of the economy). The t-statistics shows that GE coefficient results are significant. However, the reaction of the economic growth towards government expenditure was not expected. This is because, according to the Keynesian theory, an increase in government spending is growth-enhancing in the long-run through multiplier effects. According to Makhoba, et al. (2019), the inefficiency of government programmes are likely to be the reason behind the adverse link between government spending and GDP growth rate as they lead to wastages and losses.

Moreover, the long-run results suggested a constructive and significant link between public debt and gross fixed capital formation coefficients towards GDP growth rate. The implication of the positive relationship between public debt and gross fixed capital formation with economic growth was that *ceteris paribus*, a 1% increase in PD and GFCF would enhance the GDP growth rate by 2.06% and 7.03% respectively. Basing on their t-statistics, the two

explanatory variables were statistically significant. The relationship between GFCF and GDP was expected. This shows that when the government of South Africa invests more in innovation, infrastructure development (land improvement) and technology advancement (plant, equipment and machinery), it leads to an increase in economic growth and development.

On the contrary, the sign of the coefficient of PD (public debt) was not expected as there have been numerous theoretical frameworks that suggest an indirect long-run relationship (Mhlaba and Phiri, 2019; Marchionne and Parekh, 2015). However, in the case of this study, the coefficient of public debt was found positive in explaining the South African GDP growth rate. Moreover, the public debt coefficient was also statistically significant. As a result, this study concludes that public debt stimulates the long-run economic growth. The assumption is that there are well-designed strategies and proper public debt management in South Africa (Dombi and Dedak, 2019).

The next step after estimating the long-run results is to determine the short-run or the speed of adjustment. Table 4.7 presents the speed of adjustment results.

Table 4.7: The Speed of the Adjustment results: GDP

Variable(s)	**Coefficient**	**Standard Errors**	**t-statistics**
CointEq1	*-0.019*	*0.046*	*-0.412*
D (GDP(-1))	*-0.275*	*0.221*	*-1.247*
D (GE(-1))	*0.123*	*0.618*	*0.199*
D (GR(-1))	*0.273*	*0.402*	*0.681*
D (PD(-1))	*-0.056*	*0.134*	*-0.423*
D (GFCF(-1))	*-0.975*	*0.357*	*-2.731*

Table 4.7 displays an insignificant error term coefficient for economic growth of -0.02. The findings indicate that less than 2% of the variation in the GDP growth rate is correlated within a year, which is very small. This implies that GDP is unresponsive to its covariates in the short-

run. In a nutshell, the results displayed in Table 4.7 shows that the GDP growth rate will not readjust downwards to restore long-run equilibrium when it oversteps its cointegrating relationship with fiscal policy variables.

4.4) Diagnostic check results

It is crucial for this study to check the validity and credibility of the cointegration results. The diagnostic tests in this section include the serial correlation test, normality test, heteroskedasticity test and the polynomial test.

4.4.1) Serial Correlation Test Results

Serial correlation can be a challenge when employing time series data. It indicates that there might be important variables omitted or the t-statistic values overestimated and standard errors underestimated. The study used the Breusch-Godfrey serial correlation LM test to examine if there is any serial correlation challenge. Table 4.6 below presents the results obtained.

Table 4.8: Serial Correlation LM Test

Null hypothesis: No serial correlation at lag h						
Lag	**LRE* stat**	**Df**	**Prob.**	**Rao F-stat**	**Df**	**Prob.**
1	29.01713	25	0.2632	1.207734	(25, 46.1)	0.2834
2	21.09345	25	0.6874	0.815497	(25, 46.1)	0.7038

The hypothesis of serial correlation LM test is specified as follows:

H_0: *No serial correlation*

H_1: *Serial correlation*

Based on the results of serial correlation LM test in Table 4.6, it is evident that the estimated residuals have no serial correlation present as both p-values at lag 1 and 2 are more than

5% level of significance. Therefore, the study fails to reject the null hypothesis and conclude that there is no serial correlation.

4.4.2) Normality test results

The Multivariate normality test is conducted using Cholesky of covariance (Lutkepohl) test. The study mainly focuses on the Jarque-Bera test to ensure that the estimated VEC residuals are normally distributed. Table 4.7 below presents the results obtained from the Jarque-Bera test.

Table 4.9: VEC Residual Normality Test (Jarque-Bera)

Component	Jarque-Bera	Df	Prob.
1	1.268299	2	0.5304
2	4.386987	2	0.1115
3	0.080950	2	0.9603
4	0.151949	2	0.9268
5	2.405299	2	0.3004
Joint	**8.293484**	**10**	**0.6002**

The test hypothesis of the normal distribution is specified as follows:

H_0: *Error terms are normally distributed*

H_1: *Error terms are not normally distributed*

Based on the Jarque-Bera results of a normality distributed test in Table 4.7, it is undeniable that jointly the error terms are normally distributed. The study fails to reject the null hypothesis of error terms are normally distributed, as the joint probability of 0.6 is more than 5% level of significance. Henceforth, the study concludes that the residual of the model is normally distributed.

4.4.3) Heteroskedasticity Test

Heteroscedasticity is tested using White Heteroscedasticity Test with no cross-terms. This is done to examine if the model's variance is constant (homoskedasticity) or not (heteroskedasticity). Table 4.10 presents the results obtained.

Table 4.10: White Heteroskedasticity Test Results

Chi-squared	Df	Prob.
182.222	180	0.4397

The test hypothesis of the White test of heteroskedasticity is specified as follows:

H_0: $No\ heteroskedasticity\ present$

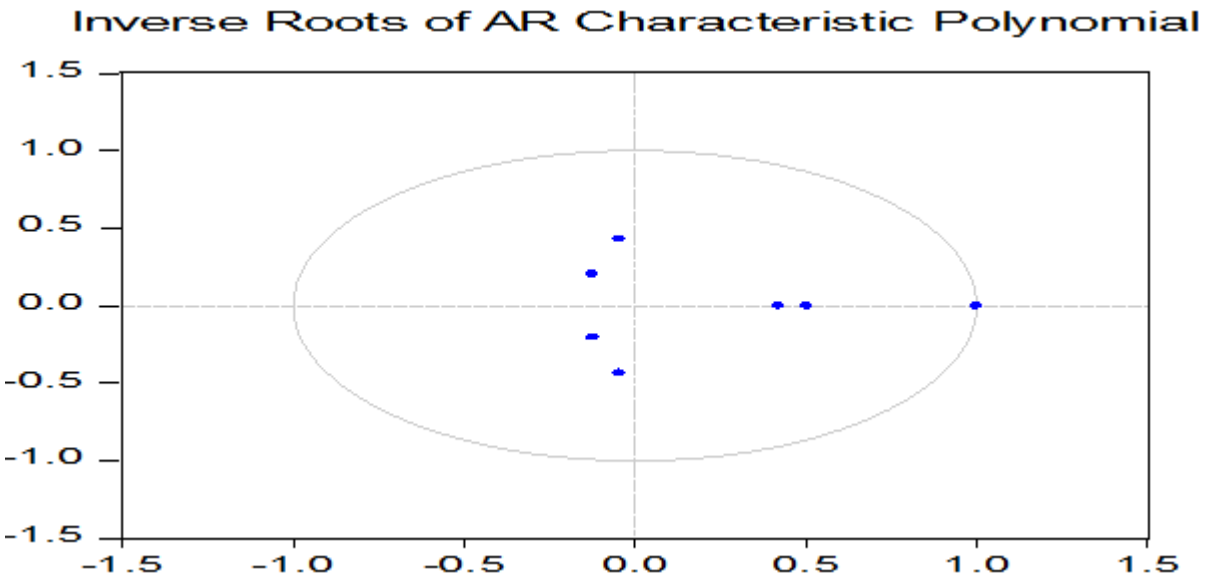
H_1: $Heteroskedasticity\ present$

Judging from the White Heteroskedasticity test result in Table 4.10, it is evident that the variance of the estimated model is constant. Moreover, looking at the probability of Chi-squared 0.44 in particular, the study fails to reject the null hypothesis above, as the p-value is more than 10% level of significance and conclude that the estimated model is homoskedastic.

4.4.4) Stability Test

The study also employs the Inverse Root of AR Characteristics to test for stability in the model. Figure 4.1 below indicates that all the AR polynomial falls within the unit circle, indicating that the VEC model is good and stable.

Figure 4.1: Inverse Roots of AR Characteristic Polynomial



4.5) Granger Causality

The next step after the diagnostic checking is to analyse the direction of the causality between GDP growth rate and the fiscal policy explanatory variables. This is done by examining the link between GDP, more specifically with other variables using a Pairwise Granger Causality tests. The empirical finding of the Pairwise Granger Causality tests is presented in Table 4.9.

Table 4.11 Pairwise Granger Causality results.

Null Hypothesis:	Obs	F-Statistics	Prob.	Conclusion
GE does not Granger Cause GDP *GDP does not Granger Cause GE*	29 29	0.884 0.030	0.356 0.863	No causality No causality
GR does not Granger Cause GDP *GDP does not Granger Cause GR*	29 29	4.912 3.196	0.036 0.086	Causality Causality
PD does not Granger Cause GDP *GDP does not Granger Cause PD*	29 29	0.071 11.127	0.793 0.003	No causality Causality
GFCF does not Granger Cause GDP *GDP does not Granger Cause GFCF*	29 29	9.052 40.449	0.006 0.000	Causality Causality

The results presented in Table 4.9, reveals bi-directional causation between GDP with GR and between GDP and GFCF. Notably, the results also show a uni-directional causal link between PD and GDP. In other words, PD does not granger cause GDP but a GDP that granger cause PD. This makes economic sense because when the economic growth rate is decreasing the government tends to borrow more, to substitute for that lack. Further, the study unexpectedly observes no causal link between GE and GDP.

4.6) Results of GDP Variance Decomposition on the explanatory variables

It is essential for this study to assess how economic growth reacts to shocks coming from fiscal policy indicators in South Africa using the Variance Decomposition (VD). VD will help this study to determine the proportion of variation of the forecast error variance of the dependent variable (GDP) that can be explained by exogenous shocks variable to other independent variables in the VECM. Table 4.10 presents the Variance Decomposition results of GDP on the independent variables over 10 periods.

Table 4.10: Variance Decomposition of GDP using Cholesky Factors

Period	S.E.	GDP	GE	GR	PD	GFCF
1	1.596373	100.0000	0.000000	0.000000	0.000000	0.000000
2	2.112064	81.55561	2.251687	0.125802	5.754225	10.31268
3	2.464707	66.60342	2.480055	1.593599	16.37885	12.94407
4	2.723890	60.62977	2.152576	4.284846	20.00969	12.92312
5	2.959109	57.56105	2.214319	5.229263	21.56238	13.43299
6	3.181549	54.73200	2.410046	5.791778	23.06276	14.00342
7	3.386597	52.43323	2.537285	6.382474	24.28547	14.36155
8	3.578352	50.68980	2.648275	6.860899	25.16864	14.63239
9	3.760424	49.28123	2.757034	7.226073	25.86706	14.86860

10	3.934063	48.09933	2.852102	7.529705	26.45221	15.06664

Basing on the empirical finding presented in the above Table 4.10, it is obvious that in the first period 100% of the economic growth variance is explained by its shocks. As time passes by, the result also shows that the GDP contributions continued to deplete until it reaches 48.1% in the last quarter. Nevertheless, the inconsistencies in the growth rate can be explained by its shocks. This is because over the five years forecasted it remains the highest contribution as compared to the explanatory variables.

The importance of GE, GR, PD and GFCF in explaining the variation of GDP is demonstrated in the next period. As shown in Table 10, from the second year, GE is responsible for 2.25% in the variation of the growth rate, PD is reliable for 5.75% meanwhile GR and GFCF are responsible for 0.13% and 10.31% respectively. By looking at the results obtained from this analysis, it is evident that PD and GFCF mainly influence GDP. As a result, the study concludes that the contributions from the government expenditure, public debt and gross capital formation explain the inconsistencies in the level of South African GDP growth rate.

4.7) Results of Generalised Impulse Response Functions

Generalised Impulsive Response Function (GIRF) validates how the current and future values of endogenous variables react to one-time shocks. Employing the GIRF analysis is very important for the study as the results reveal how shocks to economic variables resound through a system. In other words, by computing the GIRF, the study will be able to assess the degree of unexpected shocks of 10 years on GDP, GE, GR, PD and GFCF. Appendix 1 presents the results of Generalised Impulse Response Functions.

The analysis in GIRF results is mainly interested in the response of GDP growth rate due to the shocks of its own and fiscal policy variables (GE, GR, PD and GFCF). The IRF results

reveal a positive response of GDP to its shock, and it is statistically significant throughout the study. Furthermore, the GDP response to GE shocks shows a persistent negative impact sustained throughout the study. This negative response of GDP to the unexpected government expenditure shocks justifies the significant decrease of the South African economic growth rate.

Based on the outcome of GIRF, the study further observes that in the first three years, GDP responds positively to the unanticipated shock in GR. Nevertheless, a negative response from GDP is shown afterwards. Moreover, notably, a shock in PD affects the growth of GDP in the first four years and increases its growth afterwards. The study unexpectedly observes that GFCF shocks only impacts the response of GDP positively in the first period, then, later on, negate the response. In summary, the results of GIRF indicates that the economic growth of South Africa respond negatively to the shocks in government expenditure, government revenue and gross fixed capital formation and positively to the shock in public debt.

4.8) Conclusion

This chapter revealed the empirical findings of both the descriptive statistics and the regression model. The investigation was carried out with the aim to respond to the main question of how effective is the fiscal policy actions towards economic growth. The study used the annual data spanning from 1990 to 2019 to analyse the descriptive statistics and VECM model.

The findings in this study revealed that the increase of public debt and gross fixed capital formation has positive effects on economic growth in the long-run. Meanwhile, the findings of government expenditure and revenue, revealed that the increase in government expenditure and revenue has adverse effects on economic growth in the long-run. However, the coefficient of government revenue was not statistically significant. Therefore the study concludes that the fiscal policy actions in South Africa have an adverse impact on economic growth, however,

the negative impact is minimised by proper management of public debt and the increase in gross fixed capital formation. Based on the stability and diagnostic tests undertaken in this empirical analysis, the findings obtained in this study revealed that the model is of the goodness of fit.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1) Introduction

In light of the empirical findings, this chapter draws a conclusion which involves the summary of the major results of the study, policy implications, limitations of the study and areas for further research suggestions.

5.2) Key findings

There have been recent debates circulating over the effects of the fiscal policy on economic growth in South Africa. This study sought to examine the effectiveness of the fiscal policy on economic growth in South Africa using the annual time-series data of 1990 to 2019. Variables such as government expenditure, government revenue, public debt and gross fixed capital formation were incorporated to assist in explaining the behaviour of fiscal policy actions towards the growth of the South African economy. Both descriptive statistics and VECM techniques were employed to assess the causation between the variables used.

The study started by looking at the overview of fiscal performance in South Africa through assessing the summary of descriptive statistics and the cross-correlation coefficients of the fiscal policy components to GDP. The summary of the descriptive statistics revealed that the performance of fiscal policy on economic growth in South Africa had been mixed with diverse changes over the past three decades. The trends in fiscal policy components and real GDP growth rate displayed tremendous changes after the 2008-09 financial crisis in South Africa. In essence, after the crisis, the findings show a decline of the economic growth and gross fixed capital formation, as government expenditure, revenue and public debt increased. Moreover,

the concerns discovered were that the growth of the economy was insignificant with lower investments levels whereas public debt and expenditure levels were high.

Furthermore, the study went on to investigate the co-movement between the real GDP growth rate and the components of fiscal policy. This was done by calculating the cross-correlation coefficients of the time series to assess the sequence of change on the leads and lags of the variables. The empirical findings revealed that government expenditure negatively correlates with the economic growth of South Africa and the majority of both lags and leads were significant. Meanwhile, the association between public debt and government revenue with GDP growth rate was negative and weak. Nevertheless, when considering the gross capital formation, the causation showed a negative impact on the first to third lags and positive impact on the first and second leads.

To clarify the causation and to establish the contribution that the fiscal policy components make to sustain the South African economic growth, the study extended the analysis on the primary mode of adopting the VECM procedures. VECM techniques were analysed to assess the long-run and short-run nature of the relationship between fiscal policy actions and economic growth. The findings revealed the existence of a long-run relationship among variables. The government expenditure was discovered to have a significant adverse effect on economic growth, while public debt and gross fixed capital formation have a significant positive impact on economic growth in the long-run. The effectiveness of government revenue on economic growth, in the long run, was discovered to be insignificant.

The findings of the short-run model estimated revealed that the GDP growth rate is unresponsive to its covariates in the short-run and its adjustment to restore long-run equilibrium is insignificant at 2% per annum. Both the stability and diagnostic test were applied to validate cointegration results and evaluate the goodness of fit in the model. The empirical findings

confirmed the worth of the estimated VECM model as it passed all the sensitivity tests against serial correlation, normality, functional misspecification and heteroscedasticity.

This study further employed the Granger Causality test; Generalised Impulsive Response Function and Variation Decomposition test to determine the direction of the causation and assess the reaction of economic growth to shocks coming from fiscal policy. The findings from the Granger Causality test revealed the bi-directional causation between government revenue and GDP growth rate and between gross fixed capital formation and GDP growth rate. Interestingly, the causality test also indicated that public debt does not influence the growth of the economy. Instead, it is the other way around; economic growth does Granger cause public debt. This makes economic sense because when the economic growth rate is decreasing the government tend to borrow more, to substitute for that lack.

The results from the Variation Decomposition and Generalised Impulsive Response Function tests indicated that the variation in economic growth is explained by its shock in the first period. However, the inconsistencies in the level of the South African GDP growth rate in the second period is defined by the contributions from the government expenditure, public debt and gross capital formation. Moreover, the study's analysis reveals that the economic growth responds negatively to shocks in government expenditure, government revenue and gross fixed capital formation and positively to the shock in public debt.

Based on the empirical findings, this study concludes that the increase of government spending as part of the fiscal policy actions is not credible in sustaining the growing economy in South Africa. The findings of this study are consistent with studies on developing economies which recommend that governments should focus on investing more in growth-stimulating expenses such as infrastructure and technological advancement than social consumption.

Nevertheless, the study's findings reveal that the positive effects of public debt on the economic growth in South Africa. This indicates that borrowing costs and financial risk is being reduced by proper public debt management. According to the endogenous growth model, a positive effect on the economy from the public debt can occur if there is an investment subsidy on the side that covers a portion of the interest cost of capital. However, this study does not encourage the continuous upsurge of public debt as it decreases the investments which were likely to stimulate the economy.

5.3) Policy recommendations

Although policy recommendations on fiscal policy have no guarantee in stimulating economic growth, eradicating poverty and unemployment, some suggestions if implemented carefully, can help in addressing some structural economic challenges. If the policymakers understand the long-run consequences of every fiscal policy action, they will be in a better position to determine the nature of the prudent macroeconomic policies to implement.

In light of the empirical findings, this study draws a list of suggestions that can benefit the fiscal policy actions in improving the growth of the South African economy. Firstly, the government should avoid exploiting resources and production elements when spending on social consumption and encourage an efficient production body that focuses on increasing investment expenditure. Moreover, the government should concentrate more on directing these expenditures to improve production, technological development and infrastructure, which increases investments, attracts tourists and ultimately boost economic growth.

According to the empirical results revealed in the previous chapter, the increase in government revenue negates the growth of the economy in the long-run. However, the coefficient of revenue was statistically insignificant. This shows that government revenue is not credible to protect the economy in the long-run. To avoid the upcoming negative effect of government

revenue, the study recommends that the government of South Africa must impose an effective taxation policy that eliminates tax evasion. The advantages of this implication are that there a chance of fair distribution of wealth and public reassurance generated with effective taxation policy. Moreover, through anti-corruption measures, the government can direct its revenues to investment expenditures. This way, all social groups, from the upper to the lower class, will not be affected.

Although public debt has positive effects on economic growth, the government should not only focus on proper management of public debt to avoid borrowing cost and financial risk but on clearing both external and internal debts. This is because public debt has a negative effect on employment and investment. Importantly, the government of South Africa should continue formulating friendly policies that encourage the increase of gross fixed capital formation.

5.4) Limitations of the study

Finally, the study faced three major limitations of which the policymakers would also need to take note when applying the policy recommendations mentioned above. Like other previous studies, given the multi-dimensional nature of growth in a country, this study measured economic growth as a single indicator (real GDP growth rate), leaving out important socio-economics issues (such as poverty, vulnerability, inequality and unemployment) and macro-economic factors which include savings, inflation and investment which are equally important.

Secondly, the study's findings were unable to break the total government expenditure down into productive and unproductive expenditure, such as consumption expenditure, capital expenditure, expenditure on public sector wages and security, government expenses on health and education, and expenses on technological developments (transport and communication). In other words, the splitting of government expenditure into productive and unproductive

government could be useful to identify the exact components of government expenditure which are favourable and unfavourable to the economic growth for policy implications.

Lastly, the study was unable to unfold different types of productive and unproductive government debt, such as internal and external debt as short and long term debt. Importantly, by grouping public debt into productive and unproductive debt, the study could reveal the type of debts that are beneficial to the growth of the economy and those which are detrimental.

5.5) Area for further research

To analyse the behaviour of fiscal policy toward economic growth in South Africa, these study variables such as total government expenditure, total government revenue, national public debt, gross capital formation and real GDP growth rate were used. For further research in this study, both socio-economic variables such as poverty, vulnerability, human capital, unemployment and macro-economic variables such as savings, investment and inflation indicators are recommended as part of the indicators of economic growth of the economy. Moreover, the study suggests further research where the total government expenditure and government debt is split into productive and unproductive expenditure and debt. This can benefit policymakers to ensure the type of productive expenditure to invest in and type of expenditure to limit. On the same note, it will help the government to borrow in funds that are more favourable to the economy. Lastly, further studies should go beyond 1990 when choosing the data as it will reveal the impact of regime changes to the fiscal policy, during the peak and trough time of the economy.

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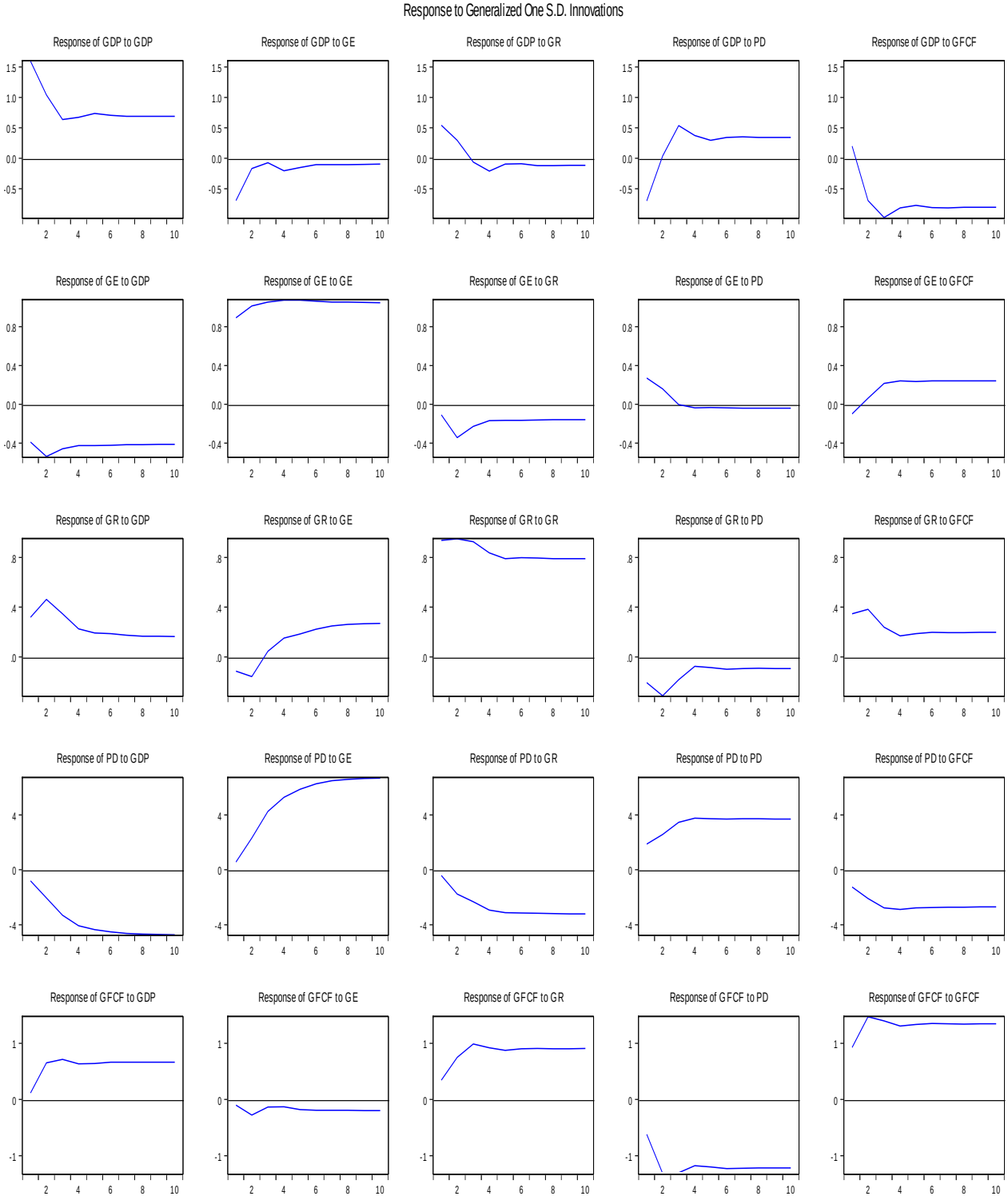
LIST OF APPENDIXES

Appendix 1: Generalised Impulse Response Functions Results



Appendix 2: List of Times Series Codes Used

Gross Domestic Product (GDP) at Market Prices	KBP6006D
Government Revenues as a percentage of GDP	KBP4433K
Government Expenditure as a percentage of GDP	KBP4434K
Gross Capital Formation as a percentage of GDP	KBP6282L
Gross National Debt as a percentage of GDP	KBP4116K