The Impact of Fiscal and Monetary Policy on Economic Growth in Southern African Custom Union (SACU) Member Economies between 1980 and 2017: A Panel ARDL Approach

N.E Monamodi

orcid.org/0000-0001-9998-4756

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Supervisor:	Prof Ireen Choga
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Student number:	23755644

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I the undersigned Nkosinathi Emmanuel Monamodi student number 23755644, declare that “The impact of fiscal and monetary policy on economic growth in SACU member economies between 1980 and 2017: A panel ARDL approach” is my own work and that all sources which have been used in this study have been accurately recognized. This paper has never been presented to any university in an attempt to obtain any award.

DEDICATIONS

I dedicate this dissertation to the Mabaso family, Soko family, Monamodi family, my mother Ntombizodwa Monamodi, my late grandmother Emmah Victoria Mabaso, my late father Bheki Soko and my best friend Songezo Mpini.

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ABSTRACT

This study seeks to investigate the impact of fiscal and monetary policy on economic growth in Southern African Custom Union (SACU) member economies between 1980 and 2017. Government expenditure and revenue were used as the proxy variables for the fiscal policy whereas real interest rate, inflation, official exchange rate and M2 money supply were used as the proxy variables for monetary policy. Using Lin, Levin and Chu (LLC), and Im, Peresan and Shin (IPS) unit root tests, it was found that all variables were stationary at level except for M2 money supply which was found to be stationary after first difference. Due to this, Panel Auto Regression Distributed Lags (PARDL) estimation technique was utilized in this study.

Pooled Mean Group (PMG) PARDL model estimator was used in this study. The results indicate that fiscal and monetary policy influence economic growth significantly in the long run. However, fiscal policy is only significant if government expenditure is used as the functional policy instrument rather than government revenue. In the short run, the effects of these two macroeconomic policies on economic growth are mixed.

Granger causality results indicate that the direction government expenditure, real interest rate, inflation and official exchange rate Granger cause economic growth. These causality links are uni-directional in nature. Lastly, the results also indicate that private investment is crowded out in the long run because of significant high levels of government expenditure in the long run across SACU member economies. In the short run, private investment is crowded out because of significant high level of government expenditure only in Swaziland.

As some of the recommendations of this study, SACU member governments should redirect their public expenditures into investing more in human capital. Investing in human capital, among other factors can include empowering the active unemployed population with relevant skills that meet labor markets for easy employment. In that case, the tax revenues would increase which could play an important role in reducing government budget deficits. Furthermore, SACU member economies' central banks can make monetary policy more effective by using monetary accommodation. Hence, when the governments apply expansionary fiscal policy, the central banks can increase money supply to avoid interest rates from increasing (monetizing budget deficit).

Keywords: Economic growth, Fiscal policy, Monetary policy, PARDL, SACU, PMG

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SACU	Southern African Custom Union
GDP	Gross Domestic Product
RGDP	Real Gross Domestic Product
MTEF	Medium Term Expenditure Framework
SARB	South African Reserve Bank
IT	Inflation Targeting
SA	South Africa
CMA	Common Monetary Area
LNS	Lesotho, Namibia and Swaziland
SOEs	State Owned Enterprises
RMA	Rand Monetary Area
PARDL	Panel Auto Regression Distributed Lags
MTBPS	Medium Term Budget Policy System
GEAR	Growth Employment and Redistribution
RDP	Reconstruction and Development Program
GFCF	Gross Fixed Capital Formation
HIPC	Highly Indebted Poor Countries
IMF	International Monetary Forum
VAT	Value Added Tax
SADC	Southern African Development Community

AfDB	African Development Bank
CPI	Consumer Price Index
UK	United Kingdom
US	United State
ITTC	Inflation Targeting Technical Committee
LMA	Lesotho Monetary Authority
CBL	Central Bank of Lesotho
MLAR	Mortgage Lenders Administrators Return
MAS	Monetary Authority of Swaziland
BLNS	Botswana, Lesotho, Namibia and Swaziland
ZAR	South African Rand
CBS	Central Bank of Swaziland
BoB	Bank of Botswana
BoBCs	Bank of Botswana Certificates
BWP	Botswana Pula
MPC	Monetary Policy Committee
Repo Rate	Repurchase Rate
PVECM	Panel Vector Error Correction Model
ADF	Augmented Dickey Fuller
MENA	Middle East and North Africa
ECM	Error Correction Model

PPP	Purchasing Power Parity
VAR	Vector Auto Regression
SVAR	Structural Vector Auto Regression
B-SVAR	Bayesian Structural Vector Auto Regression
VECM	Vector Error Correction Model
BRICS	Brazil, Russia, India, China and South Africa
ARDL	Auto Regression Distributed Lags
OLS	Ordinary Least Squares
GMM	Generalized Method of Moments
MTAR	Multivariate Threshold Auto Regression
BSE	Botswana Stock Exchange
CGE	Computable Generalized Equations
LLC	Levin, Lin and Chu
IPS	Im, Peresan and Shin
OECD	Organization for Economic Cooperation and Development
MG	Mean Group
PMG	Pooled Mean Group
DFE	Dynamic Fixed Effects
LM	Langrage Multiplier

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Fiscal policy is for the most part believed to be related with growth (Barro, 1990). Hence, in general there are two main channels at which government spending can positively influence economic growth. The first channel involves an increment of factors of production which consequently increase the growth of output. The second one which is indirect in nature involves an increment of marginal productivity of the factors of production that are supplied privately (Barro, 1990). On the other hand, government revenue which is mostly taxes is generally believed to be having a negative association with economic growth but positive associated to public expenditure. This is due to the fact that these taxes are imposed on human capital. Notably, taxes like tariffs can impact economic growth negatively because of increasing price level for capital and/or intermediate goods (Khamfula, 2004).

Just like any other African countries, SACU member economies are also known to be having high levels of government expenditure which consequently affect the market's interest rates and international economic competitiveness of these economies. For the most part, this is due to the targeted objectives meant to promote economic growth and development (Keynesian economic school of thought). Due to this, high inflation in these economies has become a norm. That is, the central banks of these economies have directed their monetary policy using money supply, interest rates and exchange rates toward an attainment of stable and sustainable inflation as it is necessary for economic growth and/or development.

Great administration by government and the monetary authorities can be dictated by the good political and economic state of a nation. It is likewise a part of good human relations and the material assets and resources at local and national government level. Therefore, the economic and political structures rely upon each other. Each economy has a duty of boosting its economic growth and development keeping in mind the end goal, which is to decrease the level of its debt and maintain price stability (keeping inflation as low as possible). This applies, in developing economies like Southern African Custom Union (SACU) members which are South Africa, Lesotho, Swaziland, Botswana and Namibia.

In South Africa, before the democratically elected government took office in 1994, the real interest rate far surpassed the GDP growth rate and the economy was running a significant budget deficit, which infers that the South African fiscal policy was unsustainable as per the neoclassical principles (Fourie and Burger, 2001). The fiscal changes of the democratically elected government strived to make an empowering environment for domestic and foreign investment. Its preservationist fiscal policy was a piece of the procedure to integrate the new South African economy into the worldwide economy (Fourie and Burger, 2003).

Financing of public expenditure in South Africa has experienced assorted changes during recent decades. After 1994, the main change was the preface and implementation of medium term expenditure framework (MTEF). This framework was first attempted between 1997 and 2000, when tax reforms and administration competency upgrades were done (Du Plessis et al., 2007). Currently, the performance of fiscal policy in the democratic South Africa has been mixed. As in the past four decades, South African government debt as a proportion of the GDP has slightly increased. Fiscal administration in the post-1994 era recorded a deficit level of -5.4 percent as the percentage of the GDP between 1994 and 2004 (Du Plessis et al., 2007). This recorded deficit level was practically identical to the average deficit level recorded in the 1960s. Government expenditure also increased to 26.4 percent in 2004, from 18.4 percent in the 1960s (National Treasury, 2009).

In terms of the monetary policy, like in other nations, the South African Reserve Bank (SARB) adopted an inflation targeting (IT) framework in February 2000. South African IT framework depends on the expectations of inflation which are predicted over a predetermined time. In the past, the Common Monetary Area (CMA) has had mixed exchange rate and monetary policies. Lesotho, Namibia and Swaziland, the LNS economies, have pegged their individual currencies to the South African currency (rand). This simply means that if South Africa has pursued a price stability macroeconomic objective, these economies will also be affected by the effects of this objective. The CMA agreement has restricted the LNS economies from practising optional monetary policies. For all of the CMA economies, this framework has been in operation as a *de-facto* monetary policy system. Obviously, the CMA agreement looks like an unbalanced monetary association or union, with South Africa being the host. This means that South Africa is in charge of monetary policy formulation and execution (Seleteng, 2014).

In the case of Lesotho, between 1996 and 2002 the government of Lesotho enlisted an average fiscal deficit of 3.8 as the percentage of GDP. The government's greatest expenditure radiated from the liquidation and privatization of State Owned Enterprises (SOEs), including two indigenous banks; Lesotho Bank and Lesotho Agricultural Development Bank. The cost of privatization was evaluated at M605.00 million which was spent on retrenchment packages. This prompted an aggregation of public debt that was utilized for financing (Maope, 2003).

The government of Lesotho also collects taxes and other revenue to fund infrastructure, social security and health, and other public needs. From the mid-1980s to the mid-2010s, Lesotho's incomes (tax and non-tax) and public spending have been unpredictable. The unpredictability has to some extent been driven by critical changes in the country's political economy. For example, the year 1993 denoted the country's political transition into a democracy after gaining independence in 1966. In accounting for the changes in the fiscal policy, income tax rates were expanded uniquely from the rates of 1962. Hence, the income tax rate was adjusted from 12.5 percent in 1962 to 35 percent in 1993 (Seleteng et al., 2017).

On the monetary policy side, Lesotho's endeavours at deciding interest rates levels in connection with South Africa have experienced a few phases. Before 1998, the central bank had set the base rate to be paid on investment and savings funds and the prime lending rate was set at a rate marginally lower than that in South Africa. This authoritative control of interest rates has now been eliminated. Statutory reserve requirements have been decreased to enable banks to loan to their clients. Fewer local asset necessities have been put on hold in view of their incapability (Ikhide and Uanguta, 2010).

As of late the central Bank of Lesotho attempted some liquidity administration as a method for curbing excess liquidity in the economy through the adoption of Treasury bill auction. Treasury bills, notwithstanding giving opportunities to eliminate excess liquidity from the system, are required to offer competitive domestic investment opportunities for banks. This ought to discourage or eliminate capital outflow for the sake of higher returns and drain foreign exchange reserve. When excess liquidity is swallowed through open market transactions, banks could pay for their needs in the inter-bank market and approach the central bank as the lender of final resort (Ikhide and Uanguta, 2010).

In the case of Swaziland, the government of Swaziland has not been very dynamic in the domestic market over the previous years, until the point when it floated such a large number of various debt instruments in a short time in 2010. This was after the economy had been neglected by the International monetary forum (IMF) to get a letter of support, which was to empower it to access budget support loans from outer lenders. From that point forward the government of Swaziland changed its debt methodology from 80:20 percent for external loan support to 50:50 percent, i.e. 50 percent external debt and 50 percent domestic debt. External and domestic debts have different effects on economic growth. Burguet and Ruiz (1998) see domestic debt as costlier in contrast with concessionary external, therefore the interest load of domestic debt may utilize critical government revenue to improve expenditures. Be that as it may, according to Umaru, Hamidu, and Musa (2013) foreign debt affects the economy negatively while domestic debt reflect positively on economic growth.

In terms of the monetary policy, Swaziland cannot be seen as disconnected from the Common Monetary Area (CMA), for the essential reason that it is the member of the CMA, with Lesotho and Namibia (LNS), and Swaziland surrenders monetary policy to the South African monetary authorities (SARB). Given the parity peg of the Lilangeni to the Rand and the free mobility of capital, Swaziland, which has a small economy contrasted with that of South Africa, goes about as a price taker of interest rates from South Africa and the inflation rates for the two nations move together, with that of Swaziland quite often over that of South Africa. The monetary authorities in Swaziland fundamentally utilize the discount rate to control inflation yet it is subservient to the shocks in the discount rate in South Africa. The discount rate moved in tandem with the expansion in credit as monetary policy changes were mostly dictated by money supply growth given the nature of monetary policy between 1980 and 2006 (Ndzinisa, 2008).

In the case of Botswana, a few years after gaining independence, 60 percent of government spending was comprised of assistance from international development agencies. The fiscal spending was just at the level of 40 percent of the GDP (Lewen, 2011). Lewen (2011) also maintained that in 2007, Botswana experienced a great growth which ranked Botswana as an upper -middle-income economy, comparable to Chile and Argentina. Botswana's success is additionally emphasized and confirmed by different measure of human development. At independence, life expectancy at birth was 37 years (Honde and Fitsum, 2015). Under-five mortality declined to 45

for each 1000 births in 1990, contrasted with 180 for the whole of Africa (Taye, 2011). Development assistance contributed 3 percent to the government expenditure, and the agricultural sector contributed 2.5 percent of GDP. However, Botswana focused more on infrastructure and education.

In terms of monetary policy, Botswana moved away from the Rand Monetary Area and gained monetary independence in 1976, which led to it setting up its own central bank. At that time, the monetary policy was for control of interest rates, credit and trade controls (Masalila and Phetwe, 2001). By then, the target of the monetary policy was meant to help improve the balance of payments, to keep up a liberal foreign trade or exchange regime, and to evade sharp changes in aggregate demand as it was expected that accomplishing these targets would be a way to achieve price stability. According to Hermans (1996), monetary policy activities concentrated primarily on affecting credit demand and investment funds by the utilization of interest rates as a policy instrument. Interest rates were decreased to reduce the costs of borrowing, and in this manner to strengthen investment.

As indicated by Setlhare (2004), the advancement of Botswana's monetary policy can be placed in two noteworthy categories. The primary category, from 1976 to 1988, is described by financial restraint, while the second category, from 1988 to the present, is portrayed by financial liberalisation. The monetary framework had financial controls (e.g. trade controls, credit control and interest rate controls among others) and the interest rates were kept low and negative in real terms to energize aggregate demand (Masalila and Phetwe, 2001). The removal of controls additionally required the remaking of the monetary policy structure, by adopting a more indirect strategy. That is, the monetary policy authorities utilized interest rates in an indirect way to impact inflationary pressures in the economy. From that point, the monetary policy continued to seek the objective of price stability by intending to accomplish low and maintainable levels of inflation. This objective adds to the more extensive national goal of sustainable economic growth (Mohohlo, 2008:2).

In the case of Namibia, after gaining Independence in 1990, Namibia's national debt has expanded at a quicker rate than GDP growth. Subsequently, aggregate government debt to GDP expanded from 9.0 percent toward the end of 1990 to 34.1 percent by the end of 2004, before declining to 30.7 percent towards the end of 2006 (Zaaruka, 2007). In any case, Namibia does not appear to

have significant macroeconomic dangers, as most macroeconomic indicators have all the hall marks of being sound. In any case, the rate at which domestic debt keeps on advancing is the main concern. Not surprisingly, an increment of debt brought about higher interest payments on instalments. Estimated as a proportion of aggregate revenue and grants, interest payment on instalments as per aggregate debt expanded from 0.8 percent in 1993 to around 5.8 percent in 2006. Since interest charges are paid from local government income, their size in respect to income prompts the capacity of the government to meet its other intermittent and capital commitments.

As per MEFMI (2001), Namibia was characterized among the nations having manageable debt levels by end of 1997. Besides, Zaaruka et al (2004) additionally affirmed the manageability of the Namibian debt by end of 2003. In spite of the fact that the level of debt is reasonable and sustainable, and moderately low by world standards, there is a need to comprehend the level at which debt will begin to negatively influence economic growth.

In terms of the monetary policy, a definitive goal of monetary policy in Namibia is to attain low and maintainable inflation in light of satisfactory economic growth and development. The structure of the monetary policy in Namibia is based on the exchange rate framework tied to the South African currency. This connection guarantees that Namibia takes on a price stability macroeconomic objective from South Africa (Bank of Namibia, 2008). As a participant of the common monetary area (CMA), Namibia opted to give up its privilege of formulating a unique monetary policy framework that is so different. Regardless of that, Namibia has, to some degree, a discretional monetary policy in view of capital controls and prudential necessities. These discretionary powers enable the Bank of Namibia to keep its repo rate at an alternative level from that of the South African Reserve Bank (SARB), when necessary. The Bank of Namibia is empowered by this discretion to maintain locally driven inflation. (Bank of Namibia, 2008).

1.2 PROBLEM STATEMENT

Macroeconomic theories that advocate for fiscal and monetary policies as essential tools to promote or improve the rate of economic growth, state that the impact of both policies on economic growth should be positive. However, the 2017 Southern Africa Custom Union (SACU) annual report contradicts this theoretical expectation.

Contradiction on the effects of these two macroeconomic policies on economic growth according to the 2017 SACU annual report, includes an implementation of expansionary fiscal policy which led to budget deficits recordings by all member states in 2016 (SACU, 2017). According to the report, Swaziland recorded the highest budget deficit as a proportion of GDP at 6.8 percent, Namibia at 5.2 percent, South Africa at 4.2 percent, Lesotho at 4 percent and Botswana at 2.8 percent. This was due to the fact that the growth of member states tax revenue for the financial years 2015 and 2016 was not good enough to surpass the total expenditure growth. As the result, the economies of SACU members was negatively affected as economic growth rates decreased.

Furthermore, as per neoclassical economics, permanent budget deficits cause interest rates to increase which consequently results to crowding out of private borrowing, provided that the rate of savings is low. Neoclassical economists also state that among the consequences of realising budget deficits, inflation might increase in the medium term and/or long run. This claim is confirmed as the report again shows that inflation increased at a higher rate in April 2017 compared to March 2016 in all member states except Lesotho. The report also shows that Swaziland recorded the highest inflation growth rate (4.8 percent) followed by South Africa with 4.5 percent, Lesotho with 3.8 percent, Namibia with 3.6 percent and Botswana with 3.4 percent (SACU, 2017). Although, the inflation rates increments are still within the target interval of 3 to 6 percent annually, the economic output decreased as the growth rates for the members experienced a sharp decline.

The current studies have not necessarily investigated the combined effect of these two macroeconomic polies on economic growth in SACU region. In fact, there is no panel study that has embarked to investigate the response of economic growth due to the combined shocks of both fiscal and monetary policy in the fore mentioned region. That is, this is the first panel study investigate the extent of these two macroeconomic policies on the growth rate of Southern African Custom Union region.

1.3 RESEARCH QUESTIONS

The following research questions will be investigated;

- Are the graphical presentations for fiscal and monetary policy variables as well as economic growth (RGDP) common across SACU member economies?

- Is there any long-run relationship between fiscal as well as monetary policy (combined) and economic growth in SACU members?
- Is the impact of these two major macroeconomic policies on economic growth homogenous across SACU member economies in the long run?
- Does the hypothesis of the "crowding out" effect of private investment hold in SACU member economies over the short and/or long run period?
- What policy recommendations can be made from the observed empirical results?

1.4 OBJECTIVES OF THE STUDY

Examination of the effect of fiscal and monetary policy on economic growth in SACU member economies between 1980 and 2017 acts as the main objective of this study. The following are the specific objectives;

- To examine the nature of the graphical presentations for both macroeconomic policies variables and economic growth in SACU member economies.
- To test whether both (combined) macroeconomic policies have a long-run relationship with economic growth in SACU member economies over the period under study.
- To test whether the effect of both macroeconomic policies on economic growth is homogenous or not across the SACU member economies in the long run.
- To test the hypothesis of the "crowding out" effect of private investment in SACU member economies over short or/and long run period.
- To articulate relevant policy recommendations based on the empirical findings to be discovered by the study.

1.5 HYPOTHESES OF THE STUDY

This study will test the following two hypotheses;

1.5.1 H_0: Fiscal and monetary policy have no significant impact on economic growth in SACU member economies in the long run.

1.5.2 H_0: The impact of fiscal and monetary policy on economic growth is heterogeneous across the SACU member economies in the long run**.**

1.6 SIGNIFICANCE OF THE STUDY

It is of great importance to achieve economic growth through sustainable and effective macroeconomic policies (fiscal and monetary policies) among other contributing economic factors. Therefore, the relationship between economic growth and macroeconomic policies must be known and carefully understood. As a result, this study will benefit governments of the SACU member economies, private investors, policy makers and the society at large. This study would help governments and policy makers to make informed decisions as far as economic growth is concerned through these macroeconomic policies. This study also serves as a foundation for future students or researchers who wish to research this topic further for better results. Private investors and society at large will gain information on the levels of the policies instruments, so that they would know if the fiscal and monetary policies are sustainable or not, as far economic growth is concerned.

In terms of literature contribution, this study will provide a regional rather than individual members' insight as to how these two macroeconomic policies have affected economic growth empirically using panel data analysis. This is due to the fact that there is no panel study that has been conducted to analyse the effect of these policies joined together. Hence, the studies that have been conducted focused on the individual effect of either fiscal or monetary on economic performance using time series data analysis for each member economy separately.

1.7 ETHICAL CONSIDERATIONS

This study relies on quantitative data which is secondary in nature, meaning that the data was collected by someone other than the user. In this regard, no potential harm (due to low or no ethical implications) in sample units can be expected. The economic theories and/or overviews underpinning this study will be used as bases to be verified by accepting or rejecting the hypotheses using statistical results.

1.8 ORGANIZATION OF THE STUDY

The study will be organized in six chapters. Chapter one is an introduction. Chapter two is an overview of economic growth, fiscal policy and monetary policy in SACU economies while stressing focus points of this study. The third chapter is literature review which comprises the

theoretical framework behind the study and the empirical reviews of the previous studies ranging from developing to developed economies, and some empirical evidence from the SACU economies. Chapter four comprises the description of data, data sources and panel autoregressive distributed lags (PARDL) methodology. Chapter five reports, interprets and discusses estimated results. Chapter six will conclude the study with key findings, policy recommendations, limitation of the study and suggestions for further research.

CHAPTER TWO

AN OVERVIEW OF FISCAL AND MONETARY POLICY IN THE SACU MEMBER ECONOMIES

2.1 INTRODUCTION

This chapter represents an overview of both fiscal and monetary policy through analyzing the trends of their respective instruments. In terms of the fiscal policy, instruments such as government expenditure and government revenue will be analyzed. As far as monetary policy is concerned, the instruments such as money supply, interest rates and inflation will also be analyzed. This chapter also discusses the policy reforms experienced for the time period under consideration.

In a nutshell, the first section is the analysis of fiscal policy (section 2.2), the second section is the analysis of monetary policy (section 2.3) and the chapter ends with concluding remarks (section 2.4).

2.2 ANALYSIS OF FISCAL POLICY

2.2.1 Fiscal policy for South Africa

Expenditure by the South African government has experienced different phases in the course of recent decades. Fundamentally, the introduction of the medium term budget policy system program (MTBPS). The MTBPS was first attempted in the period between 1997 and 2000; as a feature of the program tax changes and administration capacity advancements were done. Presently, the execution of fiscal policy after 1994 has been mixed in South Africa. Hence, Table 2.1 presents trends in fiscal policy in South Africa between 1960 and 2004.

Table 2.1 Trends in fiscal policy instruments and GDP in South Africa between 1960 and 2004

Period Average	1960 to 1969	1970 to 1979	1980 to 1989	1990 to 1993	1995 to 2004
As % of GDP					
Debt	44.7 %	39.7 %	32.4 %	39 %	45.2 %
Tax	15.9 %	19.2 %	22.3 %	23.3 %	23.8 %
Deficit	-2.5 %	-4.5 %	-3.3 %	-5.4 %	-2.5 %
Consumption	11.1 %	14.2 %	17.4 %	20%	18.7 %
Expenditure	18.4 %	23.7 %	25.6 %	28.7 %	26.4 %
GFCF	21.1 %	26.4 %	23.1 %	16.7 %	15.9 %
Real GDP	5.8 %	3.3 %	2.2 %	-0.6 %	3.0 %

Source: National Treasury (2009)

Table 2.1 demonstrates that government's debt obligation measured as the proportion of GDP has imperceptibly increased over the past four decades. In the wake of falling from a high of 40 percent during the 1960s to 32 percent during the 1980s it started scaling down in the initial four years of the 1990s. This was because of political factors as the government's administrators by then thought that it was hard to oppose demand for public spending increments (Mthethwa, 1998). The post 1994 period returned fiscal debt level to 1960s levels. Additionally, the level of the deficit that was at the peak of - 5.4 percent as a rate on GDP in the time of 1990 and 1993 was halved by the 1994-2004 sub-time span, a level essentially indistinguishable from a typical deficit to GDP during the 1960s. Public spending as the level of GDP has to a great extent increased during the time from a low of 18.4 percent during the 1960s to 26.4 percent in the decade after 1994. Mthethwa (1998) maintains that this was due to transformation undertaken by the government to improve the standards of living for South African citizens and eradicate the apartheid legacy. Similarly, Calitz et al. (2013) motivated that an increase in government expenditure in the first decade after 1994

was due to the formation and implementation of the Growth, Employment and Redistribution (GEAR), and Reconstruction and Development Programs (RDP).

Table 2.1 also shows that government's consumption expenditure has significantly increased due to higher non-wage consumption spending on education, health and their essential resources. An increment in general government expenditure on wages and non-wages factors (education, health) is also accountable for an increased consumption expenditure between 1960 and 2004. Notably, an increased consumption at the end of the apartheid era was prompted by the provision of social grants to a reasonable portion of the population (Ocran, 2009).

In 2008 to 2009, 27 percent of the population in South Africa received social grants in one form or another. These forms include child support, old age pension, disability, dependence care and foster care grants. The share of social grants was estimated to be 12% of total government expenditure in the 2009/10 fiscal year (Budget statement, 2009).

Accounting for gross fixed capital formation (GFCF), it is notable that government's investment has been lower compared to the levels of 1960's as shown in Table 2.1. The South African government's investments averaged more than 20 percent to GDP with a high level of 26.4 percent to GDP in 1970's before democracy in 1994. However, after 1994, the government's investments fell to an average of 16 percent to GDP. Table 2.2 presents trends in fiscal policy as the percentage of the GDP in South Africa between 2006 and 2013.

Table 2.2 Trends in fiscal policy instruments (as % of GDP) in South Africa between 2006 and 2013

R billions	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13
% GDP	Outcome			Estimate	Medium term estimates		
Revenue	546.8	634.1	692.0	657.5	743.5	833.4	921.3
% of GDP	30.2 %	30.7 %	29.8 %	27.3 %	28.4 %	29.1 %	29.6 %
Expenditure	522.9	599.1	715.4	841.4	905.6	975.6	1052.8
% of GDP	28.9 %	29 %	30.8 %	35.0 %	34.6 %	34.0 %	33.8 %
Budget balance	23.9	35.0	-23.4	-183.8	-162.1	-142.1	-131.5
% of GDP	1.3 %	1.7 %	-1.0 %	-7.6 %	-6.2 %	-5.0 %	-4.2 %

Source: National Treasury (2009)

Proceeding with the pattern that started in 2003, government expenditure significantly increased by 35 percent as the proportion of the GDP between 2009 and 2010 as shown in Table 2.2. This increase in government expenditure during a time of financial contraction stimulates demand and slightly balances the impacts of declining growth in different sectors of the economy.

As the economy was getting better, government spending growth rate was supposed to moderate to the level that was practical and sustainable, with total government spending settling at 34.1 percent of GDP in the medium term. This considers extra spending of R78 billion at the fundamental spending level of –R17 billion in 2011, R24 billion in 2011/12 and R37 billion in 2012/2013 (National Treasury, 2009). Reserve funds and reprioritization of allocations of R14.5 billion already in place at national level and R12.6 billion at provincial level, increased the accessibility of funds to support new fiscal priorities. Subsequent to around 9 percent growth a year in real terms between 2006 and 2009, real growth combined with non-interest spending by government was expected to grow by 1 percent on average between 2010 and 2013 (National Treasury, 2014)

According to the budget speech (2018), the former finance minister Mr Malusi Gigaba, indicated that the financial and fiscal viewpoint has developed since the October 2017 MTBPS. Investors' confidence has increased on the guarantee of restored policy coordination and viable implementation. However, the challenges featured in October 2017 which include rising national debt, significant revenue shortages and the shaky financial budgetary state of a few state owned enterprises remain focal policy concerns.

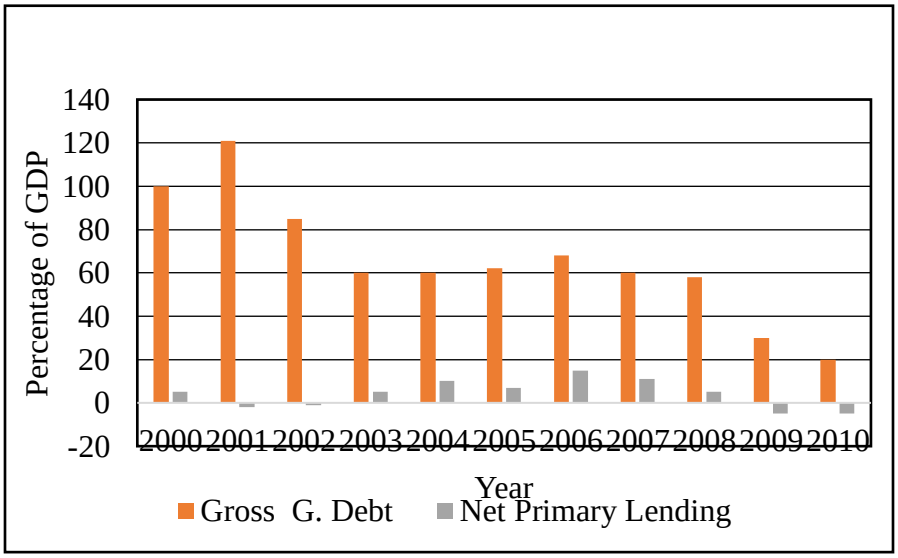
2.2.2 Fiscal policy for Lesotho

Nseera (2013) states that fiscal sustainability has progressively turned into a vital theme for discussion in both developing and developed nations following the worldwide economic and financial crisis. The crisis which started off as a matter of course on financial sector assets in the United States immediately changed into an economic crisis when it was transferred to the real sector of the economy during 2008.

Mirroring the 2008 to 2009 worldwide economic and financial conditions, economic growth dropped from 5.6 to 4.3 percent between 2010 and 2011 which consequently led to a decrease in government revenues (Nseera, 2013). With SACU custom receipts constituting the greater part of budgetary incomes (40 percent), the worldwide financial crises furthermore engineered the enlarging of the fiscal deficit through the international trade channel.

Under a circumstance of committed domestic revenues and international inflows, foreign and local financing of the deficit has progressed toward becoming progressively troublesome for trade dependent economies like Lesotho. Lesotho has needed to draw down on its net long term international savings or reserves to cover the gap left by the drop in the SACU revenues at the risk of neglecting to keep up parity between the maloti and the rand. Hence, Figure 2.2 presents Lesotho's general government gross debt and primary net lending over the period 2000 to 2011.

Figure 2.1: Lesotho's general government gross debt and primary net lending/borrowing between 2000 and 2010

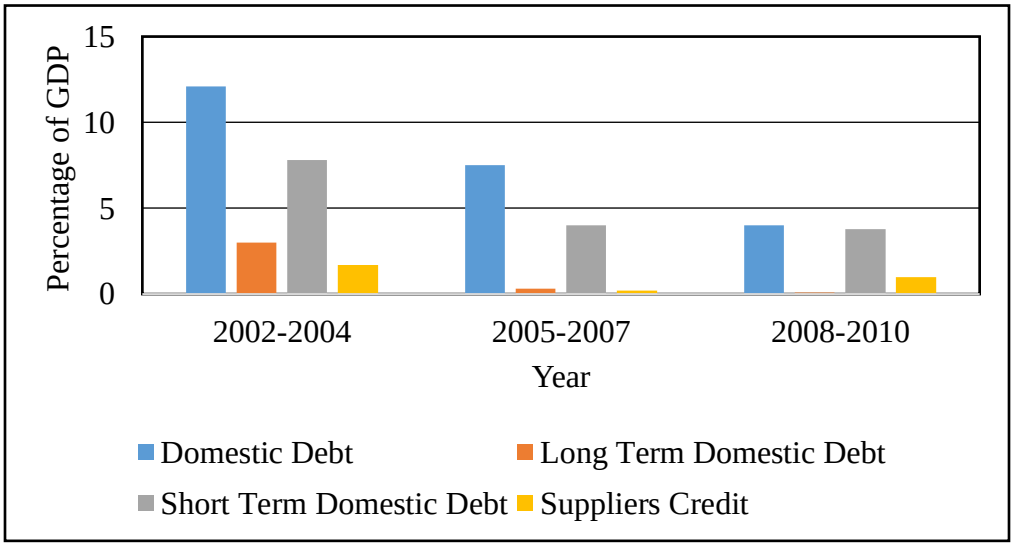


Source: Nseera (2013)

The financial crisis has influenced the fiscal position to fall from a surplus to a deficit position after the crisis. Lesotho's primary source of revenue continues to be the Southern African Customs Union (SACU) which, in the post-crisis period, has encountered a sharp decrease, in this way restricting government's fiscal space. Unfortunately, the government spending has not hinted any noteworthy adjustment to the new fiscal circumstances. While the surpluses generated from the SACU revenue pool had in the past helped Lesotho to recover non-concessional costly loans and kept the debt to gross domestic product proportion (GDP ratio) at lower levels, it likewise added to larger amounts of expenditures, specifically higher wage bills (17 % of GDP in 2011) which have been demonstrably difficult to decrease, and this has to some extent added to the deficit as shown in Figure 2.1.

While revenue to GDP proportion has declined, wages and salaries have been kept up at 15 percent of GDP-post crisis, comparable to levels when the economy was encountering surpluses from SACU (2006-2008) and getting a robust economic growth. Under committed revenue circumstances and diminished donor financing, the economy's fiscal position may demonstrate unsustainability in the short to medium-term and even beyond, relying upon the growth viewpoint and accessibility of budgetary resources, both external and domestic. Hence, Figure 2.2 presents Lesotho's domestic debt over the period of 2002 to 2010.

Figure 2.2: Lesotho's domestic debt and structure between 2002 and 2010

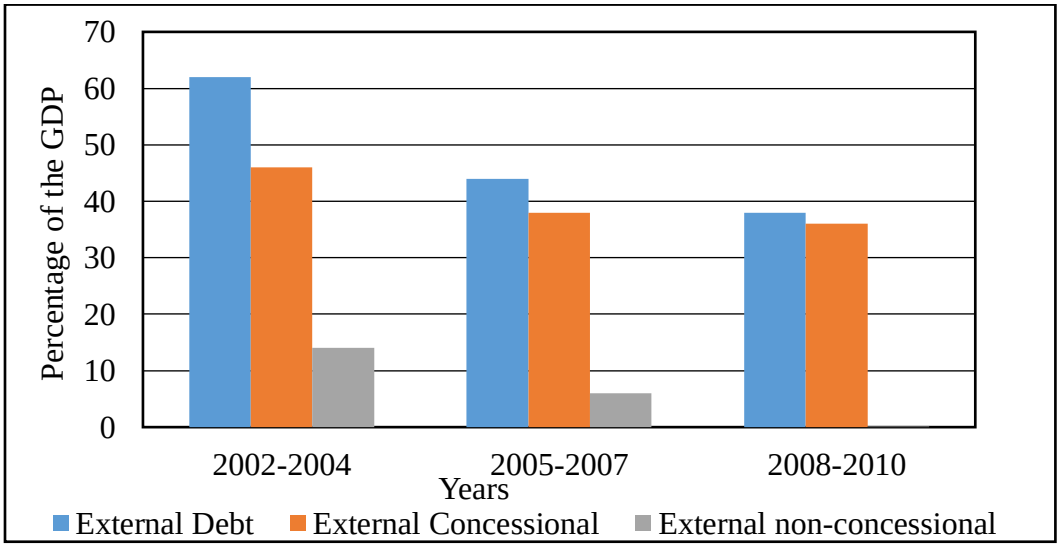


Source: Government of Lesotho (2012)

As shown in Figure 2.2, domestic debt has significantly dropped after some time. For the period 2002 to 2010, public domestic debt dropped to a yearly average of 5 percent of GDP from 13 percent, to a great extent, reflecting a sense of responsibility regarding debt management and the overhauling of loans bolstered by the past surplus from the SACU revenue pool.

Nonetheless, the structure of domestic debt has continued as before, sustained by short term and then long run bank borrowing. It is, notwithstanding, intriguing to take note that between 2008 and 2010, the period when the economic crises escalated, there was a precise drop in domestic financing over instruments (short term, long term and suppliers' credit). In any case, since 2010, there has appeared to be an efficient shift away from long term borrowing to suppliers' credit. The stock of suppliers' credit kept on developing amid the crises as the bilateral and multilateral debt stocks demonstrated noteworthy decrease. This pattern may proceed as external financing proves hard to get. Hence, Figure 2.3 provides the Lesotho's external debt and structure between 2002 and 2010.

Figure 2.3: **Lesotho's external debt and structure between 2002 and 2010**



Source: Government of Lesotho (2012)

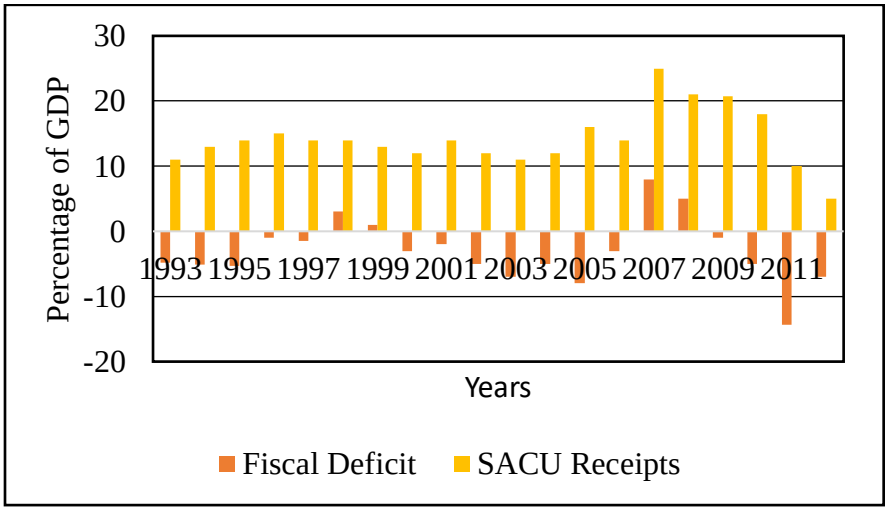
As shown in Figure 2.3, Lesotho's external debt as a percent of GDP has advanced overtime, dropping from a yearly average of 60 in 2002-2004 to 40 in 2008-2010. The latter, was the period influenced by the worldwide economic and financial crises. There was a lasting drop in the external debt stock as a level of GDP over time, partially echoing the deliberate effort to dispense with non-concessional loans but to a great extent mirroring the difficulty in getting to new financing from the worldwide benefactor community, specifically after the worldwide financial crises, which heightened the scarcity of financing assets.

2.2.3 Fiscal policy for Swaziland

Generally, Swaziland has depended vigorously on income generated from exports as well as its trade agreements with South Africa (which happens to be its principle trade partner), which accounts for 70 percent of entire exports of Swaziland, and around 90 percent of goods and services that are bought outside the boarders of Swaziland (Ndzinisi, 2008). Swaziland has good road links that join it with South Africa. The East-West road is more established since it makes it possible for Swaziland to trade merchandise using a port in Mozambique. The majority of imports by Swaziland used to be delivered by this port before the political chaos in Mozambique in the 1980s. Mozambique's 1980s political chaos moved numerous exports by Swaziland to ports in South Africa. Currently, Swaziland, for the most part, utilizes the port to export sugar, citrus and

items made from forest inputs, with future use of the port anticipated to increase. Meanwhile, a north-south rail road finished in 1986 gives a connection between the rail network in the eastern Transvaal and the ports of Durban and Richard's Bay in South Africa. Hence, Figure 2.4 reports the trend for Swaziland's fiscal deficit and SACU receipts over the period of 1992 to 2012.

Figure 2.4: **The trends for Swaziland's fiscal deficit and SACU receipts between 1992 and 2012**



Source: Swaziland Ministry of Finance (2013)

Increased SACU receipts assisted the Swaziland's government in realizing huge budget surpluses as the SACU receipts received by Swaziland are generally higher than the fiscal deficits as shown in Figure 2.4. Consequently, this led to an accumulation of significant worldwide reserves. According to the Swaziland Ministry of Finance (2013), Swaziland's receipts from SACU increased by 6 percent (as a percentage of the GDP) from 18.1 percent in 2005/6 to 24 percent in 2008/9. This was because of the development of the South African economy and an increased international trade mobility, coming from an increased SACU revenue pool. As reflected in Figure 2.4, SACU revenue decreased by 66 percent, which represents 11 percent of the GDP. This decline was realized in 2009/10 during the worldwide economic and financial crises, and Swaziland also recorded fiscal deficits, as also shown in Figure 2.4.

SACU imports decreased in 2010/11 due to pressure on economic activity in South Africa and loosening up of infrastructure spending over the 2010 FIFA world cup. Hence, Swaziland experienced a decline in SACU receipts (11 percent of GDP) in 2010/11. Consequently, Swaziland experienced a fiscal crisis by recording a fiscal deficit between 2010 and 2011 as shown in Figure

2.4. At that time when different economies decreased their dependence on taxes paid on international markets and increased their dependence on direct and indirect taxes, Swaziland did not have solid ground in expanding its dependence on different taxes as the main source of fiscal revenue. Instead, Swaziland became vulnerable to external shocks (Ndzinisa, 2008).

Figure 2.4 also shows that the budget deficit, which recorded 14.3 percent of GDP, was one of the most surprising in sub-Saharan Africa during the period of 2011. This huge fiscal deficit was for the most part covered by domestic borrowings, government deposits at the central bank, and an accumulation of unpaid domestic debts adding up to over £1 billion, every year (Swaziland, 2990). Due to this kind of fiscal environment, the economy was held hostage and struggled to create a healthy environment for the private sector (crowding out effect).

In the Swaziland's perspective, decreasing government spending and over-reliance on SACU receipts by increasing levies (taxes) on income and profits, and value added tax (VAT) still remain a significant system for Swaziland to balance its fiscal policy. In the IMF's benchmark standards, this kind of fiscal medium prompts huge cuts in spending, on the off-chance that, left unaddressed for quite a long time, an increase in this kind of fiscal deficits would increase net government public debt and interests on the installments which would consequently lead to unsustainable debt levels.

Accordingly, Swaziland's government has embarked on a fiscal change strategies that could help in adjusting fiscal deficit to accessible financing. Swaziland's government adopted some type of austerity, aimed at decreasing the budget deficit, reestablishing economic growth, creating more employment, enhancing the level of quality and efficiency of public spending as well as to boldly tackle corruption. However, implementation of these strategies has been slow.

2.2.3.1 Medium term fiscal challenges

The most valuable fiscal variable in Swaziland is public expenditure on public goods and services like health insurance, training and infrastructural investment. Government intends to pass on these basic public goods and services, in a way that they would make a noteworthy impact on realizing higher economic growth and development rates, and decrease unemployment, subsequently decreasing poverty. Unfortunately, taxes have not been viewed as a fiscal variable in either expansionary or contractionary conditions. Hence, Table 2.3 presents the summary for Swaziland's overall budgetary system.

Table 2.3: The summary of Swaziland's overall budgetary system

	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11
Government income & Grant	3890.7	4842.3	5499.1	8020.4	8085.5	9409.9	9145.7	6584.1
Income	3763.9	4726.7	5326.8	7854.4	7891.3	9264.0	8899.0	6084.7
Grant from abroad	126.9	115.6	172.2	165.6	187.3	145.0	246.7	499.4
Aggregate spending & Lending	4324.7	5557.4	5828.9	6062.7	7472.6	9780.3	10427.8	10231.4
Current Spending	3457.7	4295.8	4416.3	4681.3	5822.2	7308.2	7957.3	7683.5
Capital Spending	867.1	1258.7	1409.7	1436.6	1950.4	2472.1	2470.3	2547.8
Total lending	(0.1)	2.9	2.9	(55.2)	0.0	0.0	0.0	0.0
Total Surplus (deficit)	(436.0)	(175.0)	(329.9)	1987.7	612.9	(370.4)	(1282.1)	(3647.3)
Financing	434.0	715.0	329.9	(1987.7)	(612.9)	370.4	1282.1	3647.3
Foreign	75.2	220.0	211.5	140.2	413.1	(154.1)	12.6	357.5
Gross Borrowing	182.8	349.1	383.1	323.4	257.8	236.5	289.4	712.5
Amortization	(107.5)	(129.1)	(171.6)	(183.2)	155.3	(390.7)	(276.8)	(355)
Domestic	358.8	495.1	118.4	(2097.9)	(1026.0)	524.6	1269.5	3289.8

Source: Swaziland Ministry of Finance (2013)

Table 2.3 outlines activities performed by the government through fiscal policy, public expenditures as well as the means for financing them. During the 1990s, Swaziland regularly ran small budget deficits. Government expenditure as a proportion of GDP was comprehensively steady by 30 percent between 1993 and 1999. Dlamini and Kunene (2008) maintain that these

shocks were due to the fact that Swaziland's economy performed at its maximum capacity due to extensive increase in direct foreign investment due to economic sanctions against apartheid in South Africa.

Table 2.3 also shows that government expenditure rose by 35 percent of GDP in 2004/05 and remained at that level until 2007. In 2008/9 government expenditure increased significantly to 40.6 percent in 2008/9 and 43.3 percent over the period of 2009/10. This was due to salary increase. In general, government expenditure increased between 2003/4 and 2009/10 by 10.2 percent of GDP.

2.2.4 Fiscal policy for Botswana

Following three years (2013 to 2016) of fiscal budget surpluses, the government balance experienced deficit, due to lower mining incomes, a decrease in incomes from the South African Customs Union (SACU), and higher fiscal expenditure, some portion of which is identified with the Government Stimulus Program (IMF, 2016). The report also indicates that the budget deficit had been financed by drawing on already collected investment funds and acquiring a small amount of Botswana's domestic debt. Hence, Table 2.4 presents Botswana's fiscal policy instruments and associated economic variables between 2005 and 2016.

Table 2.4: The trends for Botswana's fiscal policy instruments and associated economic variables between 2005 and 2016

	2005/6	2010 /11	2011/12	2012/13	2013/14	2014/15	2015/16
Total Government income & Grants	37.7	30.4	34.7	33.6	35.1	34.2	33.9
Tax Income	34.1	28.1	32.4	31.3	32.1	31.7	31.4
Grants	0.2	0.3	0.5	0.4	0.2	0.3	0.3
Aggregate Spending & Loaning	29.8	0.3	34.9	32.8	29.9	31.0	30.1
Current Spending	23.9	36.6	26.1	26.2	24.1	24.1	23.1
Minus Interest	23.4	25.3	25.6	25.6	23.6	23.4	22.4
Operating expenses (Wages & Salaries)	8.8	11.3	11.7	11.7	11.0	11.3	11.0
Interest	0.5	0.5	0.5	0.5	0.5	0.6	0.7
Capital Spending	6.4	10.8	9	6.7	6.4	7.1	7.1
Initial balance	8.4	-5.7	0.4	1.3	5.7	3.8	4.5
Overall balance	7.8	-6.2	-0.2	0.7	5.2	3.2	3.8

Source: Bank of Botswana (2017)

Table 2.4 shows that the Botswana's fiscal position shifted from a deficit balance recorded during worldwide economic crises to a surplus in 2015/16. This recorded surplus was the fourth consecutive budget surplus (3.8 percent from 3.2 percent of GDP in 2014/15). Modisaemang et al. (2015) emphasize that this was because of higher received revenue from the mining sector and control of fiscal spending. Table 2.4 also shows that overall government spending recorded 33.9 percent of GDP in 2015/16. According to IMF (2016) report, an increase in Botswana's total government revenue was due to an increase in mineral revenue, SACU receipts and non-mineral income tax by 34.4, 29.5 and 17.5 percent respectively. Furthermore, due to trade liberation for diamond exports, a noteworthy increment in mineral revenues was realized (SACU, 2017).

Additionally, to accomplish fiscal balance, Botswana's government uses strategies like controlling the extent at which wage bill is increasing (11 percent of GDP), increasing public revenue, streamlining the substantial scale used for taxation and privatization and merger of state corporates. Botswana's government is likewise aiming at a fiscal rule aimed for upgrading expenditure to enhance profitable public investments.

Concerning taxes, strategies are being proposed by the government to modernize and streamline the taxation framework so that administration costs may be reduced and accomplish higher consistency accomplished. A coordinated taxpayer framework has just been formulated and implemented by Botswana Unified Revenue Services (BURS). The BURS has also decided to open an exclusive office for high tax payers. In addition, revision of income tax revision was booked to be presented in parliament during the 2014/15 fiscal year.

2.2.4.1 Botswana's fiscal policy sustainability

The fundamental goal of Botswana's debt policy is to keep public debt sensible at a minimum risk as far as possible with the goal that fiscal manageability might be accomplished. Botswana's government has dependably clung to its debt policy and financial standards, which totally restrain foreign and domestic debt to 40 percent of GDP. That is, 20 percent local and 20 percent foreign (Taye, 2011). This strict limit is, regardless, far less than the Southern African Development Community's (SADC) combination level of 60 percent of GDP and has constrained Botswana's government to borrow less.

The substance of government debt was balanced between foreign and domestic sources until 2009/10 when the budget deficit accomplished 70 percent of total debt in view of an additional

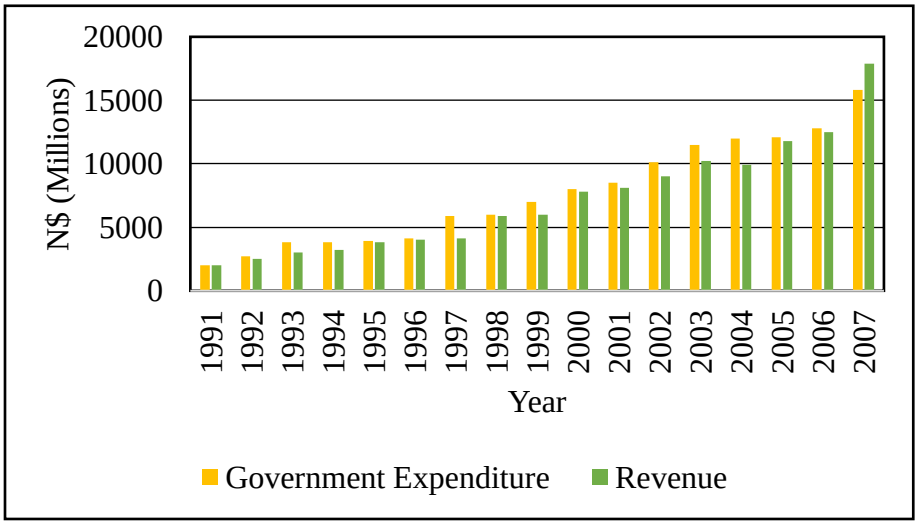
borrowing. This incorporated a spending loan for a total of 1.5 billion United States dollars (USD) from the African Development Bank (AfDB). This credit was planned to protect Botswana from the results of worldwide financial crises. As the result, total debt expanded from 8.8 to 25.3 percent of GDP between 2008 and 2010 (Taye, 2011).

Modisaemang et al. (2015) maintain that internal debt was still kept under the limit in accordance with the objective of enhancing revenue collection and expenditure restraint. With aid from the World Bank, the IMF and the Macroeconomic and Financial Management Institution (MFMI), Botswana's government was in the process of establishing the Medium Term Debt Management Strategy (MTBPS) in 2014.

2.2.5 Fiscal policy for Namibia

The Namibian government like any developing country's government, is faced with a challenge of generating enough revenue to meet its fiscal obligations. As a result, Namibia has been running a budget deficit since 1990 when it gained independence. Hence, Figure 2.5 presents the trends in government expenditure and revenue between 1990 and 2007.

Figure 2.5: The trend for Namibia's total government expenditure and revenue between 1990 and 2007



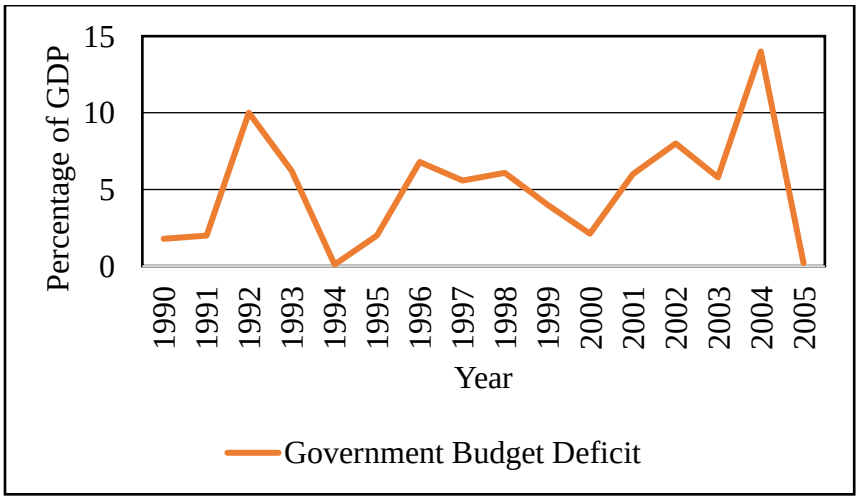
Source: Motlaleng et al. (2011)

Total government spending dramatically increased to N$ 4556.8 million in 1995/6 from N$ 2103.4 million in 1990/1. It kept on increasing to N$ 8650.9 million in 2000/1 and increased again in

2006/7 by N$6649.1 million, which all-in-all recorded a 77 percent increase. Hence, over the period 1990 to 2007, total government expenditure was growing by the average growth rate of 6.83 percent. Shafuda (2015) indicated that these changes in government expenditure were due to the needs necessary for Namibia's development.

Figure 2.5 also shows that between 1990 and 2003, Namibia experienced an increase in government receipts (revenue). However, in 2004, the Namibian government revenue decreased but kept on increasing the following year (2005). Nakale (2015) motivates that government revenue increase was due to income received from the export of ores and minerals that represented at least 50 percent of total exports between 1990 and 2007. However, the revenue acquired by the Namibian government was not enough to cover general expenditure. Hence, since gaining independence, the Namibian government has been recording budget deficits yearly. Domestic borrowing has however been a source of financing these budget deficits. Consequently, this has brought about the expanded government domestic debt obligation. Hence, Figure 2.6 presents Namibia's government deficit measured as the percentage of the GDP.

Figure 2.6: Namibia government budget deficit as a percentage of GDP between 1990 and 2005



Source: Motlaleng et al. (2011)

Figure 2.6 depicts government budget deficit measured as a percentage of GDP between 1990 and 2005. Government budget deficit has been generally low and fluctuating between the intervals of 0.1 and 10 percent of GDP. On average, Namibia's government has been recording a budget deficit

of 5.1 percent of GDP yearly. Fortunately, after gaining independence in 2007, Namibia recorded its first expenditure surplus of N$921 million which is 2 percent of GDP. As per Price Water House Coopers (2008), this surplus came because of the expanded payment receipts from the Southern African Customs Union (SACU).

2.3 ANALYSIS OF MONETARY POLICY

In the 1990s numerous central banks around the world strived to maintain financial stability in their economies, and more especially, a reasonably low rate of inflation, and the banks were no exception in such manner. Over a significant period, the objectives of national banks had changed, yet by the 1990s the commitments of numerous national banks had turned out to be solidified in their goal to accomplish money financial stability.

2.3.1 Monetary policy for South Africa

Promptly on taking office in August 1989, Dr Stals who was South African Reserve Bank governor for the said period, focused on the need for financial discipline in the country. In the chairman's address at the Annual General Meeting of the shareholders of the bank on 28 August 1989, Dr Stals affirmed that the time had come for South Africa to put a high priority on battling inflation, as the seasonally adjusted yearly rate of inflation as estimated by the consumer price index (CPI), added up to 14,3 percent in the third quarter of 1989. Dr Stals repeated this message at a meeting held in Durban in December 1989. Hence, the following table represents the macroeconomic aggregates per monetary policy regime before inflation targeting in South Africa;

Table 2.5: South African macroeconomic aggregates per monetary policy regime prior to inflation targeting

Years	Monetary Policy Regime
1960	Quantitative regulations on interest rates and credit because of the implementation of the liquid assets ratio framework, were adopted as the monetary policy functional channels.
1981-1985	Due to transition, a mixed system was implemented.
1986-1998	Cost of cash reserve framework and target by fore announced monetary target (M3) was adopted.
1998-Date	As from February 2000, channels such as daily, weekly and tender liquidity by in repurchasing (Repo) transactions were utilized. Price stability objective was also adopted.

Source: South African Reserve Bank (2001)

As portrayed in Table 2.5, South African monetary policy policy has had three administrations since 1960. The first administration which was adopted in 1960 was based on liquid assets ratio where quantitative controls were enforced on the interest rate and credit. This administration worked until mid-1980s. Immediately after the end of the first monetary policy administration, two administrations were taken into place between 1981 and 1997. The first administration during 1980s and 1997 took place between 1981 and 1985 where mixed system was implemented. The second administration was adopted between 1986 and 1997. This administration was adopted based on the recommendations and proposal made by De Kock in the commission reports (1978, 1985) (Gidlow, 1995).

On the second administration, cash reserve framework was utilized. SARB discount rate was the most useful instrument under this framework since it was used to influence the cost associated with medium term collateralized borrowing and market interest rates. Open market operations (OMO) and distinctive policy measures on general liquid affected the supply of the credit. The credit's supply was affected in the following manner, an industrious money market experienced shortage and commercial banks' rates were ordinarily solidly associated with bank rate due to the bank rate being set tolerably high. Monetary control was considered to work by implication raised

by the moderate demand for money, with a normal lag for its distinctive impact on inflation of over a year (Stals, 1995).

De Kock made proposal on utilizing wide meaning of money (M3) as the monetary target during the De Kock commission (1985). M3 broad money growth's three centered moving average was used to set the target ranges. It was only in March spending this was accounted for to cover the period from the last quarter of the prior year to the fourth quarter of the next year.

The setting of the target was indicated to suit both foreseen growth rate and to maintain inflation, but the system that was applied to select the objective was not transparent. In like manner, these targets were intended to be treated as rules instead of strict standards (Clarida and Gertler, 1997). The SARB had a discretion to destroy/abandon these targets in spite of foreign trade and financial shocks. However, there was no discipline for breaking these targets nor any legally required public purpose behind breaking the targets.

Any usefulness of these targets was distinctly diminished by wide monetary progression that started during the 1980s, and extensive capital flows experienced as from 1994. The rules were bolstered by a blended arrangement of indicators which among others incorporate the exchange rate, assets prices, output gap, balance of payments, wage settlements, total credit extension as well as fiscal position (Stals, 1997). These indicators had an influence in previous years, but the extent of their influence were not disclosed. Policy was particularly unclear during that time and that decreased the accountability of the SARB. Likewise, policy activities in the midst of 1996 and 1998 were some of the time exceedingly controversial, and excessive to both fiscal and economic growth.

A third administration of monetary policy was actualized from March 1998, with the repurchase (repo) interest rate being market determined in daily tenders of liquidity through repurchase exchanges. A full arrangement of the assessed daily liquidity requirement of banks demonstrated an impartial position for the SARB, while minor over-or under-provision hailed an inclination for balancing out the repo rate at winning levels (Stals, 1999). Basic over or under-arrangement of liquidity hailed an inclination for development in the repo rate.

2.3.1.1 Inflation Targeting in South Africa

Adoption and implementation of inflation targeting (IT) framework in South Africa around the year 2000 was expected to improve transparency, accountability and consistency of the South African monetary policy. Since the year 2000 this framework has experienced few developments with developing institutional system (Van der Merwe, 2004). As of now, the target set for inflation means to accomplish an increase in the general consumer price index, barring the cost of 3 to 6 percent on the mortgage interest. CPIX is strictly characterized for metropolitan as well as urban locations and has a more extensive scope of household (80 percent) than CPI which only records the scope of 40 percent.

At first, the Ministry of Finance was responsible for the inflation target range but later it was set by the National Treasury which is a department under the Ministry of Finance. The cabinet makes the final decision on the target range. National Treasury and the Reserve Bank representation formed a committee known as the Inflation Targeting Technical Committee (ITTC) in 2001 to advice on technical issues.

A target was calculated as an increase in an average rate of 3 to 6 percent CPIX yearly until 2002. In 2001, 2003 and 2004 the target was set to 3 to 6 percent, and 3 to 5 percent in 2005, which was adjusted to 3 to 6 percent later in that year. These changes were made to respond to the exogenous shocks. In November 2003, the requirement that CPIX should be inside the annual national target rate of inflation was adjusted, to a consistent target range of 3 to 6 percent beyond 2006. The correction of this framework decreased the interest rate volatility that could have followed from a logically decreasing target horizon (Monetary Policy Review, 2004).

South Africa as a small economy that is open to foreign trades, is subject to exogenous shocks which directly and indirectly influence domestic prices. For example, an unexpected increase in oil prices or a dry season influencing domestic food prices may result in an increase in inflation beyond the target range, where the monetary policy has minimal rapid impact. However, the monetary policy can be relied upon to address the secondary effects and discard factors that initiated inflationary projections. In November 2003, SARB together with National Treasury overhauled the escape clause for greater adaptability.

The procedure of interest rate setting can extensively be shown by Svensson's prescribed policy of adaptable and transparent inflation targeting (Svensson et al, 2002), so adapting sensibly to

changes in supply. Inflation is not be monitored at the shortest conceivable horizon by inconsistent and unpredictable policy, but instead at a more extended phase of a few years. The adaptable approach points likewise to balance out the business cycle and hence the output gap. In the short run inflation may deviate from the target range. The deviations may sometimes be significant.

The South African Reserve Bank (2007) indicates that from 2000 there had been an improved change, irrespective of the nominal exchange rate shock in 2001 quarter 4. This shock together with local grain price increases resulted in increased inflation between 2002 and 2003. The interest rate responded moderately to the rand depreciation in 2001; irrespective of the savings rate increases during 1997-1998 rand depreciation, which confused trade market meditations, brought about severe consequences to public finances as well as economic growth in South Africa.

2.3.2 Monetary policy for Lesotho

The bank (central bank) was set up as the Lesotho Monetary Authority (LMA) in 1978, by Act of Parliament, yet only started to be operational in January 1980. At the time, the LMA's primary goals were to issue and redeem currency; to advance and maintain internal and external financial stability, an efficient payments framework and the liquidity, solvency and legitimate operation of a sound monetary and fiscal framework; and to encourage monetary, credit and financial conditions helpful for the systematic, balanced and managed economic growth of Lesotho.

In 1982, the LMA's name was changed, through a correction of the LMA Act of 1978, to the Central Bank of Lesotho (CBL). This resulted in more duties as the bank at that point began to accept roles of the borrower of the last resort and additionally banker to government. In 2000, the Parliament of Lesotho supplanted the old Act with another CBL Act (CBL Act 2000). As indicated in the Act, the bank's essential goal is to accomplish and maintain price stability.

2.3.2.1 Lesotho’s monetary policy environment during 1990s

An acknowledgment that direct controls have a tendency to be inadequate and distortionary and support inefficient utilization of financial assets, among others, prompted the adoption of the reforms in the monetary sector. Since the usage of the structural adjustment program in 1988/89, various reforms have been attempted in the monetary framework. At the initiation of the program, the broad goal of government towards the financial sector was to improve budgetary

intermediation by means of expanding the scope of money market instruments accessible for policy consideration (Maope, 2003).

Savings funds mobility into equity holding was imagined as a beginning stage towards building up a capital market, in spite of the fact that at an exceptionally early stage, Lesotho Investment Holdings was built up to encourage savings to be directed into holding equity (CLB, 2001). In addition, the sale of treasury bills and government securities was started as a method for building up a securities market. While trying to empower rivalry and participation of the non-bank private sector and individual savers in the market, the CBL issued securities in smaller amounts since 1992.

According to (CLB, 2001), the recurrence of auctions has additionally been expanded from quarterly to monthly since 1993. Afterward, the CBL started to issue its own securities attributable to the absence of supply of treasury bills, as government debt repayments ended up being rapid. This would clear the path for market assurance of interest rates and add to the scope of monetary instruments. This policy has expanded participation in the market significantly, despite the fact that it is accepted to have crowded out private savings to some degree.

To further advance financial reconciliation and rivalry, and to encourage this improvement, it appeared to be helpful for the central bank to maintain conditions for entry of new members in the market while sticking to prudential regulations and least capital requirements. This required the audit of the legal and administrative structures that govern the tasks of financial institutions as contained in the Financial Institutions Act of 1973.

It was foreseen that provision might be made in the amendment of the regulations for the future administration of reserve and liquidity ratios. The slow decrease of the Mortgage Lender Administrators Return (MLAR) would encourage and improve adaptability of the market. In view of this, in 1998 the MLAR was decreased from 85 percent to 60 percent. This infers commercial banks were presently permitted to keep up to 40 percent of their assets abroad. The conceived changes were to help with urging lending to the private sector by commercial banks (Maope, 2003).

2.3.2.2 Lesotho's monetary policy strategies beyond 2001

Even when some essential procedures had been taken to move from direct policy instruments, the CBL saw that the presence of an assortment of indirect instruments is fundamental to practice more prominent adaptability in monetary policy. It is with the view of a more productive distribution of financial assets that this strategy is conceived. From this perspective, new instruments to control inflation and maintain an ideal balance of payments position are being considered for utilization. At the center of these are the open market-type operations (CBL, 2001).

These are already functioning through competitive auction of treasury bills. The repurchase order framework (repo framework) in which all transactions will be fixed for at most period of six weeks and the cash reserve requirements without interest is reserved to supplement the previous framework. It is seen that the last requirements for a systematic interbank and money markets to encourage the exploitation of the indirect instruments. Hence, corresponding policies proposed for the advancement of compelling financial intermediation and evacuation of distortions include, non-payments of interest on commercial banks' surplus assets, nullification of the MLAR and introduction of an overnight lending framework for commercial banks as a Lombard facility.

2.3.3 Monetary policy for Swaziland

In 1974, the Monetary Authority of Swaziland (MAS) came into being during 1974 through an initiative of the parliament, which later changed to Central Bank of Swaziland (CBS) (Ndzinisa, 2008). It was expected that the Act would experience regulatory adjustments to increase supervisory powers by the CBS and to redesign the framework for the prudential regulation to improve financial institutions security as well as financial intermediary organizations across Swaziland. In this regard, legitimate framework would be realized and be helpful for global trends.

The formation of the MAS accompanied the introduction and development of the Swaziland's monetary currency, the lilangeni whose its exchange rate is tied to that of South Africa (rand). The South African Reserve Bank gained interests due to domestic holding of rand notes which was changed over into the SARB's bank balances. SARB also held 100 percent sponsorship for emalangeni issued as per RMA agreement.

The lawful tender stage for the rand did not change. Hence, the rand fluctuates close to the lilangeni. Swaziland was compensated by South Africa for the loss of seignior age, in light of the

pre-determined standard to measure the estimate of the rands available for use. Nevertheless, in 1986, shortly after a progression of South African economic events, not excluding the gigantic rand's deterioration in 1985, the RMA agreement was renegotiated by Swaziland. Consequently, that is what led to the present or current common monetary area (CMA) agreement which again led to the suspension of lawful tender stage of the rand. Therefore, Swaziland decided to surrender its entitlement to get remuneration from South Africa by virtue of the circulation of the rand in the country.

Currently, the most important part of the CMA agreement is that Swaziland has the choice and freedom to shift to lilangeni from the rand. However, this depends upon management conditions. In any case, Swaziland has decided to sustain the peg for the fundamental reason that the country would benefit. It should be understood that the lilangeni's peg at standard to rand implies that any shock or adjustment in the global rand exchange rate culminates in an identical shock in the lilangeni. Fundamentally, the policy strategies sought after by Swaziland are affected by the South African policy measures.

2.3.3.1 Monetary policy challenges in Swaziland

Just like South Africa, Swaziland's definitive objective of monetary policy is to achieve price stability or low inflation. This is motivated by the central bank order. Achievement of price stability in Swaziland prompts a steady and sound structure which encourages financial merits and standards suitable and helpful for the cognitive and balanced economic growth in Swaziland.

Swaziland's noteworthy membership of the CMA has a substantial effect on the domestic monetary policy's plan and/or strategies, which accounts for a free capital trading among CMA member economies. This is despite the agreements in the prelude to the CMA, which in short indicates to some degree "…every one of the contracting states is in charge of its monetary policy and control of its financial institution" (Langa, 2001). Moreover, Swaziland enjoys the benefit of trading merchandise at no cost between Botswana, Lesotho and Namibia. This benefit comes as a result of Swaziland's membership in the SACU pool, where funds are kept to be transferred among member economies yearly (Ndzinisa, 2008). As a result, these economies end up having common external tariffs. Swaziland is a sole trade partner of South Africa, since 80 percent of Swaziland's imports come from South Africa and with more than 50 percent exports being bound for Swaziland (Ndzinisa, 2008).

There are focal points in the monetary agreement which incorporate liberating Swaziland from the necessity to make decisions on exchange rate and monetary policies, hence enabling Swaziland to focus on the pressing and emergency tasks, generally fiscal measures. Nevertheless, this agreement has weaknesses which, among others, include serious restriction of the Swaziland's capacity to develop or impact monetary policy and react to shocks influencing the economy.

To encourage the smooth execution as far as the CMA agreement is concerned, CMA participants consented to hold consistent discussion with a goal of accommodating their particular interests in a case where one participant chooses to develop, implement and change its monetary policy. The yearly meeting by the CMA commission has the duty regarding investigating any issue emerging from the CMA and other issues or concerns relating to formulation and introduction of monetary and exchange rate policies by one CMA participant (Langa, 2001). Through CMA governors meetings which are normally held quarterly before SARB monetary policy committee meetings, communication among participant states has increased in recent years.

2.3.3.2 Swaziland's monetary policy instruments

Swaziland's membership of CMA with full coordination as well as a fixed exchange rate framework blocks the autonomy of monetary policy. Hence, it is fundamental to pay attention to the instrument accessible to impact price stability. However, the Central Bank of Swaziland (CBS) has restricted forces to impact price fluctuations.

- **Money Supply**

The lawful delicate relativity of the rand ended in 1986, which consequently led to the nation seeing itself forfeiting compensation in regard of rand coursing in Swaziland (Langa, 2001). Be that as it may, Swaziland presently has a more extensive part in the administration of its reserve by liberating the rand backing. Swaziland does not have an influence over the exchange rate policy in South Africa, which is to a great extent affected by the market forces with little respect to the necessities of Swaziland's economy.

The rand's fluctuation against the lilangeni has been an indicator on how much money supply is circulating in the economy. The control of money supply by the central banks is to impact economic growth. Economic performance is accordingly viably an instrument outside the monetary authorities, for as much as lilangeni is pegged to the rand. In addition, because of the

free access by Swaziland into the South African money and capital markets the CBS control over money supply is restricted.

- **Interest Rate**

Acknowledging the fact that Swaziland CMA membership is described by the free access in South African money and capital markets, and given the exchange rate with South African rand (ZAR), plainly there is almost no degree to which Swaziland's interest rate should significantly differ from that of South Africa. On the chance where Swaziland's rates were higher than those of South Africa, then Swaziland would have pulled in more capital stock than needed, while the opposite have been valid if Swaziland could have lost capital to South Africa.

Regardless of following the South African interest rate framework, Swaziland's interest rate management with good suasion enables CBS to utilize this instrument to energize commercial banks to loan to private corporations. Practically, there have been situations where South Africa and Swaziland experience wide differentials in interest rates.

While the goal is to limit the interest rates differentials, the movement of interest rate against the trend of South Africa's in a few years has been controlled directly. For instance, as in 1998 when the rand was depreciating, interest rates were increasing inside the CMA; the differential between South African and Swaziland's interest rates achieved 6 percent (SARB, 2007). Around that time, CBS thought that increasing domestic exchange rate to the levels of South Africa would put excessive pressure on the economy and be in opposition to the goal of invigorating real sector's investment. The aim of the general policy is to maintain a differential of 0.25 to 0.50 percent. It must be noticed that this policy has an important implications, especially concerning the accessibility of capital which would result as a reaction to the differential.

A related objective is that of guaranteeing that investors are compensated positive net returns. Notwithstanding, because of inflationary pressures previously, it was impractical to compensate investors' positive net returns aside from since 1999/2000 when single-digit inflation levels were accomplished. Hence, Figure 2.7 presents comparative prime lending rates between South Africa and Swaziland.

- **Open Market Operations (OMO)**

Ideally, banks with an account with a cash surplus, as has been the case with the significantly liquid domestic banking structure, can place assets into an assortment of points of interest that

include allocations with a shortfall banking institution, allocation with the national bank under its open market operations, or purchasing short term securities, among other financial transactions.

Swaziland's financial market is both small and sensitive in light of different elements. The key factor is the requirement for a huge market for securities. This originates from the fiscal surpluses and net creditor's position that Swaziland's government has acknowledged for a long time (up until 1993/1994), which provoked the tendency that there was no convincing motivation to offer securities for financing. There are some small amounts of both treasury charges (£40 million) and securities (£30 million) that have been issued, often just to energize the money market (Ndzinisa, 2008).

These have not been attractive, and now and again the CBS also issues its own specific bills for a comparable reason. The amounts are in like manner small (£10 million) and the interest fee paid is underneath the market rate when diverged from comparable rates in South Africa. The treasury and CBS bills are auctioned on a week-by-week and month-to-month basis. Each issue has been oversubscribed.

Without significantly influential investment instruments, including certain and steady excess liquidity in the domestic bank framework, banks have generally looked towards the South African markets to manage their liquidity. Assets moved to South Africa are typically put into short term maturing deposits with the parent bank.

A capital markets development unit was set up in 1998 and the CBS's diversion in such a way has been the advancement of an appropriate regulatory system for the capital market industry in Swaziland. The elements of the unit include the improvement of capital markets in Swaziland, the creation, support and control of a market in which securities can be issued and traded in an organized and effective way.

2.3.4 Monetary policy for Botswana

In 1966, Botswana gained independence and withdrew itself from the Rand Monetary Area (RMA). The RMA similarly included nations like Lesotho, Swaziland, Namibia and South Africa. This course included the usage of one currency, the South African rand, and furthermore monetary policy being regulated from South Africa. Increments in revenues from exports pushed Botswana to structure its very own monetary policy thus setting up the Bank of Botswana (BoB) in 1976 to

drive the country's exchange rate and monetary policy techniques to best profit the economy (BoB Annual report, 2010). Hence, Table 2.6 presents Botswana's monetary policy advancements.

Table 2.6: Advancement of Botswana's monetary policy framework of BoB

Period	Monetary policy's primary objective(s)	Instruments and/or strategies of monetary policy
Before 1991	-To solve abnormalities in the banking sector due to increasing excess liquidity. - Commercial banks refusal to accept deposits from some large depositors. -Deviation of longer term interest accumulating deposits into short term deposits.	-Regulated interest rates for deposits and loaning. -Bank rate and reserve requirements. The above mentioned instruments are normally known as direct monetary policy instruments.
1997-1998	-To sustain real interest rate as per international market standards. This objective was meant to stabilize capital flows. Additionally, emphasis was also on price stability.	-Bank rate (main tool) -BoBCs introduced in 1991 (indirect monetary policy tool). These instruments were used to further liberate Botswana financially.
1998-2001	-Promoting and Maintaining monetary stability. -Sustaining real interest rates on short term yield based on three month BoBCs.	Adoption of price stability objective using; -Repos as well as reverse repos introduced to support bank rate (1998). Monetary policy committee set bank rate and BoBCs prices.

2002-Present	-To achieve manageable low and accommodative level of inflation.	-Yearly inflation target of 4 to 6 percent for 2002. -In 2006, medium term target (3 to 6 percent) was introduced to run simultaneously with yearly inflation target

Source: Nemaorani (2012)

Table 2.6 demonstrates that monetary policy in Botswana has encountered couple of stages. The financial structure used before 1991 was depicted by excess liquidity, which infers that business banks held reserves over the base legal reserve requirement at Bank of Botswana (BoB). During this period, the BoB used direct tools of monetary policy to achieve a cordial and sustainable financial environment.

As also shown in Table 2.6, direct instruments utilized include regulated lending and deposit interest rates, bank rate and required reserves. Be that as it may, the excess liquidity did not just expose the inefficiency of some monetary policy but it converted into low, sometimes negative interest rates. Hence, Botswana's economy savings were discouraged. Nevertheless, from 1991, BoB abandoned direct monetary policy tools and adopted indirect monetary policy tools which prompted Botswana's financial advancement.

These tools are bank rate and open market operations (OMO). The last incorporates the auctioning of 14-day and 91-day Bank of Botswana certificates (BoBCs) week after week and month to month, autonomously. As per Bank of Botswana (2010), the execution of monetary policy through indirect tools enhanced the accountability of the interest rates in the monetary transmission process. The bank rate is set to exchange the BoB's monetary position while the auctioning of BoBCs is set to mop up any excess liquidity in the economy. Furthermore, the mix of the two activities benchmark interest rates in the economy; for example, there is an anticipated spread between the bank rate and the prime lending rate. Since 2006, buying Bank of Botswana certificates has been reserved to business banks.

Meanwhile, instead of utilizing direct controls as far as interest rates are concerned, the framework that governs bank's lending and deposit interest rates is controlled by the mechanism of the market. Due to this, a proficient allocation of financial assets was realized. There is proof that this is a

feasible policy transmission as time goes on, shown by the ordinary yield and, as it were, steady smear for the real money market interest rates (Bank of Botswana, 2010).

The general objective of Botswana's monetary policy is to accomplish price stability, keeping inflation within the medium-term target utmost of 3-6 percent, and moreover to guarantee financial quality. Botswana's inflation tracks that of South Africa in view of the strong trade ties between the two economies, South Africa being the source of around 66 percent of Botswana's imports. Inflationary pressures have basically eased since 2012.

Annual inflation finished at 4.4 percent in 2014, lower than 5.8 percent in 2013. Key components that have driven down inflation incorporate the common log jam in costs of food and transport for the most part, and in addition base impacts of a rise in a part of the costs directed by the government in 2012. Inflation was depended upon to stay inside the BoB's target of 3 to 6 percent within the medium term assumed from the weak domestic demand and the increases of the price for foreign products.

Irrespective of the progression of the inflationary pressures, monetary policy has been obliging with a view to affect economic growth emphatically. Since December 2013, the BoB has reduced its policy rate by 200 basis points bringing it down to 7.5 percent. Consequently, credit to the private sector proceeded creating at a high rate of around 14 percent towards the end of June 2014. The improvement was driven by directed expansion in borrowing from consumers, for domestic and individual credits, which expanded by 18.6 percent.

The credit improvement is considered to assist economic activity and does not speak for any basic risks to the quality of Botswana's monetary system. In any case, ignoring the way that the household credit advancement has basically been driven by tied down lending, for the most part to real estate (private property), it requires a cautious supervision of the financial system's introduction to domestic loans and consumer welfare.

Consistent with the sliding peg framework being looked for by the authorities and the general low inflation, the genuine estimation of the Botswana currency, the Botswana pula (BWP), has remained unyielding and competitive against basic currencies. As per the policy objective of keeping up an unfaltering inflation adjusted trade of the pula against a trade weighted mix of currencies of trading economies, the BoB completed an inconspicuous descending slide of the pula

exchange rate in 2014. Patterns in bilateral nominal exchange rates displayed that on a yearly basis, the pula deteriorated against the US dollar (8.4 percent) and the pound sterling (3.0 percent) whereas it gained strength against the South African rand (1.7 percent), the euro (4.0 percent) and the yen (4.5 percent) (Nemaorani, 2012).

2.3.5 Monetary policy for Namibia

2.3.5.1 Monetary policy framework in Namibia

The objective of the central bank of Namibia is to fill in as the state's standard instrument to control the money supply, the currency and the fund associations, and to act out every other role for the most part performed by a central bank (Sindano, 2014). The MPC's basic mandate in association with monetary policy matters is obtained from the Bank of Namibia Act, 1997 (Bank of Namibia, 2008). According to the Act, one of the mandates of the Bank of Namibia is to ensure internal and external monetary stability and to help the achievement of national economic targets. In addition, to the extent indicated by Article 4 of the Common Monetary Area (CMA) bilateral monetary understanding between Namibia and South Africa, it is demonstrated that "the Bank of Namibia will keep up reserves proportionate as rand assets and transparently usable foreign currencies in such degree as the Bank of Namibia sees fit"(Bank of Namibia, 2008).

There is no formal working target in Namibia. The bank of Namibia screens the level of official reserves, as the fixed currency peg requires the country to totally back its currency accessible for utilization with worldwide reserves to import steady costs from South Africa. The operational target is a financial element that the central bank has to effect, generally on a regular implementation, through the instruments of monetary policy. The Bank would utilize its best endeavours to keep up the worldwide reserves at a level which, in its point of view, is adequate for Namibia's worldwide transactions. In such way, a base edge obtains at which remote reserves are seen as deficient. The least restraint is characterized as the currency is spread further in 30 day moving average of commercial bank net foreign trades (Nakale, 2015). Within the occasion that universal reserves are at such a level, to the point that the bank sees its adequacy at risk, it would show a report to the minister of finance (Nakale, 2015).

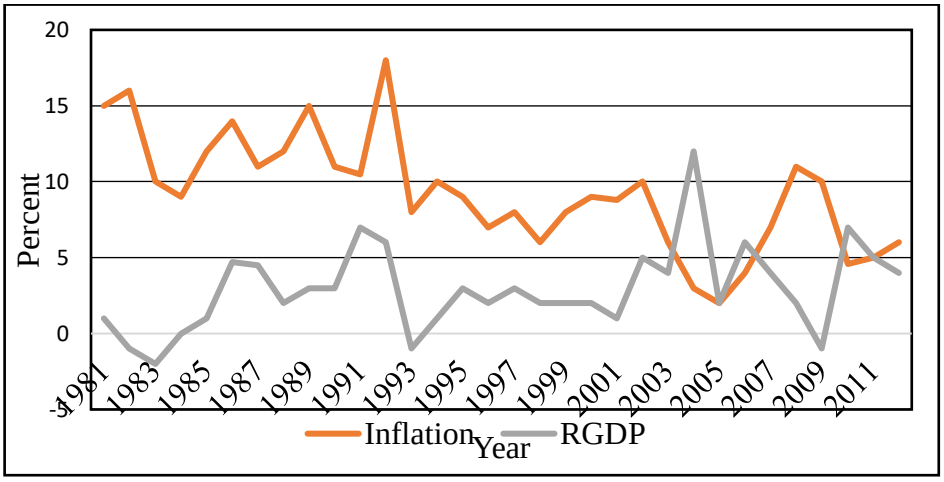
An authoritative objective of monetary policy in Namibia is to ensure price steadiness in light of a feasible economic growth and development (Bank of Namibia, 2008). Namibia's monetary policy

framework is bolstered by the fixed currency peg toward the South African Rand. Beneath a fixed exchange rate arrangement, a country cannot work on monetary policy unreservedly from the host country, as this will within the long run disturb the fixed peg through the workings of the capital account. Regardless, a country with a fixed exchange rate approach may utilize stabilization assignments, capital controls and regulatory obstacles to affect, to a particular degree, short run interest rates, and money supply and, maybe, credit expansion to the private segment to control locally provoked inflation through desires and total demand.

Irrespective of the reality that Namibia has sworn off an option of having a totally free financial system, the position of monetary policy can stray to a particular degree from that of the host currency by using capital controls and prudential necessities constrained on banking and other financial organizations. These strengths make it workable for the bank of Namibia to preserve a repo rate distinctive from the Repo rate of the South African Reserve Bank (SARB), when required, and allow it discretion to control the local money supply, appropriately engaging the Bank of Namibia to control locally driven inflation. The repo rate channel impacts the estimation of the price for retail financial merchandise and services (Ikhide and Uanguta, 2010).

In Namibia, after the official rate is changed, commercial banks in like way instantly change their lending rates. Theoretically, firms and individuals respond to the alteration in commercial bank lending rates by altering their spending and investment choices. In the case of Namibia, changes within the borrowing behaviour of consumers in the light of interest rate changes are expressed more than those of businesses (Bank of Namibia, 2008). Changes in household demand are affected within the end channel through output and domestic inflation. In this manner, the repo rate channel is the foremost basic channel in Namibia as far as affecting domestic inflation is concerned. Consequently Figure 2.9 presents the slant of expansion compared to financial development in Namibia between 1981 and 2012.

Figure 2.7: Namibia's inflation and real GDP growth rates between 1981 and 2012



Source: Sindano (2014)

Namibia had high and eccentric rates of inflation particularly within the 1980s through to the mid-1990s. Diverse reasons have been given for these patterns citing drought and foreign shocks. Figure 2.7 illustrates the patterns in yearly average CPI and GDP growth rates. The pattern doubtlessly shows a falling trend in inflation rates over the period 1981 – 2012, whereas illustrating an upward trend in GDP growth rates.

The Namibian economy has had an upward pattern regarding its growth path between 1981 and 2012. The economy was in recession from 1982 to 1984, predominantly because of the cyclical dry season that influenced the agricultural sector and the decline in the mining sector. Since the most noteworthy growth rate of 12.3 percent recorded in 2004, the economy has not recorded a twofold digit growth rate. The least GDP growth up to this point was recorded in 1983, recording a decrease of 1.8 percent due to poor performance in the mining industry (Sindano, 2014). The export-led growth strategy adopted by Namibia enhanced economic growth rate to an average of 3.3 percent for 1990-2000 (Jordaan and Eita, 2007). The exports that drove the economic growth in Namibia during that period were realized in primary industries which accounted for 3 percent on average while the secondary as well as tertiary industries accounted for 3.2 and 3.7 percent, respectively (Sindano, 2014). This was essentially credited to great performance in the fishing industry. Advance change was recorded around 2002-2012, registering an average growth rate of 5.0 percent. For this period primary industries recorded an average growth rate of 3.8 percent,

while the secondary and tertiary industries recorded growth rates of 5.2 percent and 5.4 percent, respectively (Sindano, 2014).

A yearly inflation rate of 14.8 percent was recorded in 1981, which plunged to 6.7 percent in 2012. Inflation levels have remained generally high since 1981, with rates going between 14.8 percent in 1981 and 15.2 percent in 1989. The 1980's specifically observed a sensational upward pattern in inflation particularly between 1981 and 1992. By 1992, average yearly inflation rate topped 17.9 percent (a record-breaking high). The decade 1981-1991 recorded an average inflation rate of 12.8 percent, contrasted with an average rate of 9.9 percent for the decade 1992-2002. During the period 2003-2012, inflation rate just normalized around 6.1 percent.

Decade by decade, an analysis of both inflation and GDP growth demonstrates that while the most reduced mean GDP growth rate of 1.8 percent happened during the 1981-1990 period relating to 12.9 percent average inflation rate, the highest GDP growth rate was recorded during the decade 2001-2010 at 5.0 percent, with an average inflation rate of 6.6 percent.

2.4 CONCLUSION

During 1997 and 2000, South Africa implemented a medium term budget system program. Currently, fiscal policy implementation in South Africa has been mixed. In summary, the fiscal policy has improved South Africa's living standards since 1994. However, that came with some unpleasant trends of the policy instruments as the debt level as percentage of the GDP has been significantly increasing since 1994. The taxes have also been increasing as the value added tax (VAT) has also increased from 14% in 1993 to 15% in April 2018. The fiscal policy in South Africa has been significantly effective as far as social welfare is concerned but with high levels of government expenditure, public debt and taxes.

In Lesotho, its revenue depends mostly on the exports that the nation trades. However, that has no negative implication, since Lesotho is one of the countries whose debts, both external and domestic are low hence leading to low net borrowing by Lesotho's government as discussed above. In 2008 other developing economies, Lesotho experienced a fiscal deficit because of lack of financing from the benefactor community. Although Lesotho is considered as a low debt nation, the sustainability of its major debt in the medium to long term still remains a challenge.

Swaziland's revenue depends mostly on its trade with South Africa and SACU. Swaziland's fiscal policy experienced surplus between 2005 and 2007 due to the accrued receipts from SACU (6 percent points of GDP). Swaziland did not utilize taxes as one of the fundamental policy instruments, but only government expenditure. Consequently, the level of government expenditure increased significantly, which caused a decline in capital investment by monetary authorities and banks (crowding out effect).

Botswana's government kept a rule of inter-alia which in short implies that its government expenditure should not surpass 40 percent of GDP. However due to the 2008 global financial crisis, the portion of expenditure to GDP was estimated to be beyond the limit. In 2014/15, the total expenditure decreased to the expected level as the result of rebalancing of some spending needs. With respect to fiscal sustainability, Botswana has clung to its respective debt policy and benchmarks which have positively affected Botswana's inter-alia rule. The public debt which comprises both domestic and foreign debt, was statutorily restricted to 40 percentage of the GDP (20 percent for domestic and 20 percent for foreign) which is far below the SADC convergence level of 60 percent to GDP. According to Botswana's fiscal policy prospects and goals, the debt levels remain practical and easily within the statutory target of 40 percent to GDP irrespective of increased borrowing and the 2008 world financial crisis. Currently Botswana is in the process of establishing medium term debt management strategy with an assistance from the World Bank, the IMF and the macroeconomic financial management institution (MEFMI).

Namibia, just like any developing economy, is confronting a challenge of generating enough revenue to meet its expenditure. Most of Namibia's revenue is constituted of the receipts from SACU. For the period under consideration, Namibia's expenditure has been marginally surpassing its revenue.

In terms of monetary policy, between 1960 and 1998, the South African Reserve Bank (SARB) applied different monetary policy regimes as discussed fully in section 2.2. In 2000, South African monetary authorities formulated and implemented an inflation targeting (IT) framework which focussed on the goal of financial stability through maintaining price stability in South Africa from then till now. Various instruments such as repurchase (repo) transactions and cash reserve ratios, among others, were and still are used to accomplish this objective of price stability.

Similarly, LNS (Lesotho, Namibia and Swaziland) economies decided to direct their monetary policies into an objective of maintaining price stability, hence also adopting an IT framework.

These economies set their policy instruments targets close to that of South Africa even though their policies have not been effective as that of South Africa as far as economic growth is concerned.

In the case of Botswana, after gaining independence in 1966, it opted out of the Rand Monetary Area (RMA) in 1976, which led to Botswana establishing its own central bank. In 1991, Bank of Botswana (BoB) started to utilize indirect monetary policy instruments which have been very useful in making Botswana's monetary policy effective as discussed above.

CHAPTER THREE

LITERATURE REVIEW

3.1 INTRODUCTION

This chapter presents the theoretical and literature framework underpinning the study. The theoretical framework explores the economic theories that are fundamental to this study. The empirical part examines the previous studies conducted by different researchers regarding fiscal and monetary policy, and economic growth, in developing and developed economies, and SACU member economies. In short, this chapter is divided into four sections, which are; theoretical framework (section 3.2), empirical literature on developing and developed economies, (section 3.3), empirical evidence on SACU member economies (section 3.4) and conclusion (section 3.5).

3.2 THEORETICAL FRAMEWORK

The section presents the theoretical framework that underpins the study. In a nutshell, economic theories that are fundamental to this study are explored to understand the relation of the primary variables (reflected on the primary model of the study) as per macroeconomics theorists.

3.2.1 Theories for fiscal policy

3.2.1.1 Keynesian macroeconomic theory for fiscal policy

Fiscal policy is the utilization of government expenditure and income accumulation (taxes) to impact the economy (Ocran, 2011). As per Keynesian economics, when the government changes tax and government expenditure, aggregate demand and the level of economic activity will be impacted. Fiscal policy is regularly used to balance out the economy through the span of the business cycle. Aggregate demand and the level of economic activity, savings and investment, and income distribution macroeconomic variables amongst others can be affected by the shocks/changes in the level of taxation and government expenditure (Keynes, 1970).

The simple Keynesian 45-degree model can be used as an inference tool to analyse the effect of the size of the multiplier on economic growth determined by real gross domestic product (RGDP). The model is based on the assumption that aggregate demand explains GDP in the market for goods. Furthermore, the model for the basic instrument of the Keynesian model assumes that the

quantity variable reacts to excess demand as opposed to the price variable (Fourie and Burger, 2011). The demand side is ought to explain macroeconomic activity since Keynesian model presupposes underemployment.

According to Fourie and Burger (2011), the following presents equilibrium condition for the good's market;

$$Y = C + I + G \tag{3.1}$$

$$C = cY \tag{3.2}$$

Where Y is national income (GDP), C is consumption, I is investment, G is government expenditure.

Equation 3.1 just suggests that production Y is produced to fulfil the total demand (C+I+G) which is otherwise called goods market equilibrium. Equation 3.2 presents a basic consumption function which relates consumption as a steady share of income, hence *c* denotes marginal propensity to consume which is typically fall within the range of 0 and 1. For simplicity, it is accepted that average propensity to consume is equivalent to marginal propensity to consume hence…

$$\frac{C}{Y} = \frac{\Delta C}{\Delta Y} \tag{3.3}$$

Substituting equation 3.2 into equation 3.1 and discarding C yields…

$$Y = cY + I + G \tag{3.4}$$

Treating I as exogenously a given and fixed, then equation 3.4 determines the equilibrium level of Y as a function of fiscal policy instrument G.

3.2.1.1.1 The fiscal multiplier

Assuming that Investment (I) is still exogenously a given and fixed, real GDP (Y) is demonstrated as the function of G as shown in equation 3.4. Due to this, the effect of an increase in G on Y can be easily computed hence the size of the multiplier effect, $\frac{\Delta Y}{\Delta G}$.

Taking investment as a fixed variable ($\Delta I = 0$) and introducing the differences (Δ), equation 3.4 can be written as…

$$\Delta Y = c\Delta Y + \Delta G \tag{3.5}$$

Equation 3.5 is divided by ΔG to obtain the fiscal multiplier hence after few mathematical manipulations, the fiscal multiplier$\left(\frac{\Delta Y}{\Delta G}\right)$, can be written as…

$$\frac{\Delta Y}{\Delta G} = \frac{1}{1-C} \tag{3.6}$$

Equation 3.6 is also known as the inverse of marginal propensity to save.

3.2.1.1.2 The fiscal multiplier with tax rate

Supposing that the tax rate function is given as…

$$T = tY \tag{3.7}$$

Where *T* is the tax revenue and *t* is the tax rate. Consumption function which accounts tax can be written as…

$$C = c(Y - T) = c(1 - t)Y \tag{3.2}'$$

Where (Y-T) denotes disposable income.

Substituting equation $(3.2)'$ into equation 3.1 (still keeping I fixed) and introducing the difference operators yields…

$$\Delta Y = c(Y - T)\Delta Y + \Delta G \tag{3.8}$$

Dividing equation 3.8 by ΔG yields the fiscal multiplier with the tax rate as shown in the following equation…

$$\frac{\Delta Y}{\Delta G} = \frac{1}{[1-c(1-t)]} \tag{3.6}'$$

Acknowledging that *t* appears in equation $3.6'$, the size of the multiplier with the tax rate will then be smaller than the multiplier represented by equation 3.6 (without tax rate). The multiplier decreases with the tax rate hence the higher the tax rate, the lower the consumption due to the decline in disposable income. As shown in equation 3.1, an increase in G raises Y by more than the original increase in G only if consumption increases, hence equation $3.6'$ can be written as…

$$\frac{\Delta Y}{\Delta G} = 1 + c(1 - t) + [c(1 - t)]^2 + [c(1 - t)]^3 + \cdots = \frac{1}{[1-(1-t)]} \tag{3.9}$$

3.2.1.1.3 The balanced-budget multiplier

If the policy instrument is tax revenue (T), then…

$$\Delta Y = c(\Delta Y - \Delta T) \tag{3.10}$$

Rewriting equation 3.10 by dividing by ΔT yields…

$$-\frac{\Delta Y}{\Delta T} = \frac{c}{1-c} \tag{3.11}$$

Supposing that the government raises taxes (T) and government spending by the same amounts, in this case the fiscal policy variable is the tax revenue T rather than the tax rate t. For the balanced budget constraint, government spending is equal to the government revenue ($G = T$). Introducing the difference operators, the budget constraint can also be written as…

$$\Delta G = \Delta T \tag{3.12}$$

$$\frac{\Delta Y}{\Delta G} = 1 \tag{3.13}$$

Equation 3.13 implies that the balanced budget constraint's multiplier is always equal to 1 and independent of the marginal propensity to consume.

There are two kinds of nature of fiscal policy, namely expansionary and contractionary fiscal policy. Keynesians argue that expansionary fiscal policy should be used to stimulate the economy in the times of recession and/or when the economy grows at a slow rate. In so doing, the government actions (intervention) will drive the economy to faster growth and full employment. The resulting budget deficits would be paid for by the economic boom that would come at later stage.

Government can use budget surplus to do the following, to slow down the rate at which the economy is strongly growing, and to stabilize the general prices at the time when the economy is experiencing too much of inflation.

Keynesians assume that by removing government expenditure from the economy, general prices will tend to be stabilized because of the reduced level of aggregate demand in the economy (contractionary fiscal policy).

When government's budget runs on a deficit, funds will have to be made available by borrowing from the public (government bonds), overseas borrowing or by monetizing the debt. Issuing of government bonds may cause the interest rates to increase across the financial market because of higher demand for credit created by government borrowing. Consequently, the demand for goods and services becomes lower, which is contrary to the objective of the fiscal stimulus. However,

the Keynesians argue that fiscal policy can still be effective especially when prevailing interest rates are low, and savings rate are high.

3.2.1.1.4 Critics of Keynesian fiscal policy theory

According to Motlaleng et al. (2011), the following are the critics for the Keynesian fiscal policy theory;

- Borrowing to finance budget deficit causes higher interest rates and financial crowding out.

Keynesian economics recommends increasing budget deficit in a recession phase which causes crowding out of private investment. If the government borrows more, the interest rates on bonds rise which makes the costs of investment too high. Consequently, the private sector will have less incentive to make investments.

- If the government borrows to finance higher investment while having the private sector as the borrower, resource crowding out might occur because the private sector has limited/funds resources to finance investment.
- Expansionary fiscal policy causes inflation because its effects usually comes late when the economy is in a recovering phase anyway.
- It is not easy to predict output gap because the output gap can vary.
- If the government cuts taxes financed by borrowing, people will not spend the tax cut because of believing that in future, taxes will rise to pay off the debt. Due to this, the expansionary fiscal policy would have no effect (Ricardian equivalence).
- Government size is more likely to increase because in recession government expenditure increases, therefore high taxes and spending regimes still remain the fruits of government expenditure.

3.2.1.2 Classical theory for fiscal policy

Classical theory's fundamental principle is that the economy is self-regulating hence the economy is always capable of attaining or reaching the natural level of real GDP or output, the natural level at which the economy's resources are fully employed (Khamfula, 2004). The idea here is that expansionary and contractionary fiscal policies are not necessary (contrary to Keynesian economics) for achieving economic growth. That is, there are market mechanisms to drive back the economy to equilibrium phase (the optimal level GDP growth rate).

3.2.1.2.1 Critics of classical theory for fiscal policy

Khamfula (2004) furthermore expressed the following as the critics for classical theory for fiscal policy;

- Underemployment equilibrium and waste of resources

Keynesians economists express that an assumption of full employment by the classical economists is not fully or completely warranted by facts since some employment in the economy based upon the philosophy of *laissez faire* capitalism always exists. However, Keynes discouraged this assumption on the plea that there is a waste of resources in a free market economy because of the frequent shocks in output and employment in the economy.

- Inevitability of state intervention

In the times of depression and inflation, Keynesian economists argue that government intervention in the economy is a must. Keynesian economists are convinced that a private economy market falls into a slump which could be treated only by the government through public investment and other fiscal policy instruments.

3.2.2 Theories for monetary policy

3.2.2.1 Monetarism and Monetarist theory

Monetarism theory formulated by Milton Friedman (1970) is the theory that focuses on the macroeconomic impacts of the money supply and central banking procedures or mechanisms. This theory maintains that the monetary authorities should strictly focus on maintaining price stability (inflation), and the frequent expansion of the money supply as these two monetary policy instruments are the primary drivers of economic growth (RGDP).

The monetarists emphasize that shocks in the money supply are the most essential and important determinants of the rate of economic growth as well as the response by the business cycle. This theory can put much power on economic growth when it is specifically utilized by the central banks. This theory suggests that aggregate demand for goods and services will increase if the money supply increases in the system. Hence, an increased aggregate demand gives birth to employment which in turn stimulates economic growth.

In the long run, an increment in demand will be greater than the supply. Consequently, markets will experience disequilibrium phase (excess demand) which would lead to inflation due to increasing prices. As per monetary policy objectives, interest rates are adjustable and used to control the money supply. When interest rates increase, consumers save rather than spending money, hence reducing money supply. Alternatively, depending on the nature of the economy at that time, an expansionary monetary policy through lowering interest rates (lowering the costs of borrowing) may be applied to increase money supply. Due to this, the economy will be positively impacted to grow.

3.2.2.2 Quantity of money theory

Within the parameters of the monetarism theory, Friedman (1970) also developed the quantity theory of money. Friedman proposed that money supply should grow at the fixed or constant proportion of annual rate tied to the nominal GDP growth and must be as a fixed percentage yearly. In this accord, money supply is hoped to grow at a moderate rate so that businesses may be able to adjust to the shocks in the money supply and plan their business ventures accordingly. Due to this, the economy will grow steadily as inflation will be at low levels.

Mathematically, money supply is multiplied by the annual rate at which money is spent to yield the nominal GDP (average price per unit of a good or service multiplied by the quantity of goods or services sold). Hence...

$$MV = PQ \tag{3.14}$$

Where M is money supply, V is the rate at which money changes (velocity), P is the average price of a good or service and Q is the quantity of a good or service sold.

Monetarists take velocity as a constant, meaning that money supply is the major determinant of economic growth. Hence, monetarists model economic growth as a function of economic activity (Q) and inflation (P) as shown in the following equation…

$$MV = PQ = Nominal\ GDP \tag{3.15}$$

Suppose V is a predictable constant, then changes which could either be an increase or a decrease in money supply will lead to an equal change in either the price or quantity. An increased price implies that the quantity of goods and services produced will remain unchanged. In the same

manner, an increased quantity of goods and services produced means a relatively constant price level.

Shocks in the money supply affect price levels in the long run and economic growth in the short run according to the monetarists' theory. Subsequently, a shock in the money supply determines prices, production and employment directly which ultimately determines the economic growth rate.

3.2.2.3 Keynesian theory of money

Keynes (1970) emphasizes that economic growth is to a great extent affected by the key part played by the monetary policy in an economy. Keynes proposed that interest rate, aggregate demand, level of employment, output and income are vulnerable to change in the money supply (). Aggregate supply function, decently price interest with a perfect competitive market and closed economy are some of the assumptions of the Keynesian model. Keynes also assumed non-presence of equilibrium employment in an economy which is trusted to work just in the short run. This is due to in the fact that in the long run we are for the most part dead, according to Keynes. The investigation of Keynes' thought considers money to be exogenously determined when just a single decision exists between holding bonds by wealth holders.

The hypothesis is to all intents and purposes in view of one thought, of price rigidity nature and economy perhaps working or performing underneath full employment level of output, employment, and income. Keynes' macroeconomic theory stresses the issue of output as opposed to price as a function of variety in financial and economic conditions. Analysed differently, quantity theory of money was not noticeable in Keynesian macroeconomic thought.

3.2.3 Theories for economic growth

3.2.3.1 Classical growth theory

Adam Smith developed the classical growth theory in 1776. Adam articulated that output relies on the inputs of labour, capital and land. The determinants of output growth as stated by Adam Smith are population growth (L), increase in investment (K), land growth (T) and total productivity growth of labour. The following equation represent this hypothesis…

$$Y = f(L, K, T) \quad (3.16)$$

Where Y represents output, L labour, K investment and T land.

Equation 3.16 implies that output is positively related to labour, investment and land inputs. The division of labour is the most essential input or factor of economic growth which in turn leads to output growth, technical progress and accumulation. However, the division of labour has some limitations as far as the market dimension is concerned as stated by Adam Smith. Should the division of labour increase in such a way that there is more than an increment in output, then the market dimension will increase hence the division of labour will be further induced. As a result, economic growth will be further realised. According to Smith, capital formation is also among factors that accelerate economic growth. As a result, income distribution acts as the most significant determinant of economic growth.

3.2.3.2 Keynesian growth theory

Activity role of money is the fundamental foundation of Keynesian theory as far as the principles of effective demand, saving functions, transition of savings to investment and multiplication effects are concerned. The same conclusion by Harrod, on the accelerator principle, and Domar, on multiplication effects, was reached and that conclusion simply states that the rate of growth of output relies on both national savings ratio and national capital output ratio, as expressed in the following equation…

$$Y = f(k, s) \quad (3.17)$$

Where Y denotes output, k national output ratio and s represents national savings ratio.

3.2.3.3 The endogenous growth models

The endogenous growth models emphasize technical progress resulting from the rate of investment, the size of capital stock, and the stock of human capital. The following are the assumptions behind the new growth theories:

a. The market consists of many firms.
b. Utilization or consumption of knowledge and technological advancement is non-competitive in nature.

c. At least one factor should exhibit constant returns to scale whereas all other factors (combined) exhibit increasing returns to scale.
d. Innovation is assumed to be the foundation of technological advance.
e. Market participants (individuals and firms) through market power attainment earn profits from their discoveries. This assumption basically arises as the result of increasing returns to scale in production which again leads to imperfect competition.

The above assumptions also act as the requirements for an endogenous growth theory. Based on the above assumptions, two out of the three main models of endogenous growth theory will be explained.

- Arrow's learning by doing model

Arrow was the first economist to propose the concept of learning by doing in 1962, by treating it as endogenous in the growth process. Arrow founded his model on the hypothesis that at any moment of time, new capital goods incorporate all knowledge available by then based on accumulated experience, but once built, their productive deficiencies cannot be changed by subsequent learning.

The following equation represents the short version of Arrow's model:

$$Y_i = A(K)f(K_iL_i) \tag{3.18}$$

Where Y_i denotes output of firm *i*, K_i capital of firm *i*, L_i stock labour of firm *i*, K without a subscript denotes aggregated stock of capital and A is the technology factor. Arrow demonstrated that if labour is held fixed, growth ultimately comes to a halt because socially very little is invested and produced. As a result, Arrow did not explain whether the model could lead to sustained endogenous growth.

- The Romer model

Romer (1986) presented a variation on Arrow's model which is known as learning by investment. Arrow assumed creation of knowledge as a side product of investment. Knowledge is taken as an input in the production function as shown in the following equation:

$$Y = A(R)f(R_iK_iL_i) \tag{3.19}$$

Where Y is aggregate output, A is the public stock of knowledge from research and development R, R_i denotes stock of results from expenditure on research and development by firm i, andK_i, L_i are capital and labour stock of firm i respectively. Romer further assumed that the function f is homogenously of degree one in all its inputs R_i K_i, L_i and treats R_i as a rival good. Romer took three key elements in his model which are externalities, increasing returns in the production of output and diminishing returns in the production of knowledge.

According to Romer, creation of new knowledge by other firms is derived from the research's spill-over effects by the host firm. In other words, new research technology by a spill-over instantly reaches across the entire economy. Romer's model also indicates that new knowledge through research $(A(R))$ is the ultimate determinant of long run growth which is determined by investment in research technology. Research technology exhibits diminishing returns which means that investment in research technology will not double knowledge.

3.3 EMPIRICAL LITERATURE

This section presents empirical studies that have been conducted on the impacts of fiscal and monetary policies (or their respective policy instruments) on economic growth in developing and developed economies. Some empirical evidence on the SACU member economies will also be provided. These studies are reviewed from different approaches used to analyze the impacts of fiscal and monetary policies on economic growth. Empirical review is important because it acts as an insight on whether the objectives demonstrated by such speculations and economic theories do hold or not.

3.3.1 An Overview of Studies on fiscal and monetary policy in developing economies

Mansouri (2008) undertook the study to examine the link between fiscal policy and economic growth in Egypt, Morocco and Tunisia between 1975 and 2002. Panel vector error correction model (PVECM) was used as an estimation technique. The results revealed that a one percent increase in government spending raised the real GDP by 1.26 percent in Morocco, 1.15 percent in Tunisia and 0.56 percent in Egypt. The results also showed that government spending and economic growth are related in the long run for all three countries. Hence, this study confirmed Keynesian theory for fiscal policy to be true in Egypt, Morocco and Tunisia for the period under consideration.

Sikiru et al. (2010) undertook a study to examine the impact of fiscal variables on economic performance in Nigeria between 1977 and 2009. The Engle-Granger method was utilized in the study. The results revealed that productive government expenditure has positively and significantly impacted economic growth, and there exists a long run relationship between them as confirmed by cointegration test. The results obtained in this study are consistent with Keynes's views on government intervention to influence economic growth, for the period under consideration.

Fatima et al. (2011) also undertook a study to examine the effect of fiscal deficit on investment and economic growth in India. The study utilized time series annual data between 1980 and 2009 using a simultaneous equations framework. The study established that fiscal deficit impacted economic growth and investment negatively, and the persistent balance of payment deficit was associated with fiscal deficit for the period under consideration. This simply indicates the inconsistency of the classical economists' views which, in short, suggested that fiscal deficit crowds out private investment which in turn affects economic growth negatively.

Mohanty (2012) conducted a study to investigate the link between fiscal deficit and economic performance in India between 1970 and 2012 using VECM. The study suggested that fiscal deficit significantly impacted economic growth negatively over the long run. By contrast, the results obtained in the long run did not hold in the short run. Hence, the relationship was discarded in the short run. The results also indicated that the negative influence of post-reform fiscal deficit on economic growth was more than the influence of pre-reform's fiscal deficit. In analyzing the results obtained in this study, long run results are inconsistent with classical economists' views which criticizes government intervention to influence economic growth. In the short run, the results complement Keynes's views on the public sector.

Munongo (2012) conducted a study to investigate the effectiveness of fiscal policy in spurring economic growth in Zimbabwe between 1980 and 2010. Johansen's cointegration test was used. The results indicated that government consumption expenditure and income tax affected economic growth positively during the period under study which is consistent with Keynes's views. However, Government capital expenditure influenced economic growth negatively. Cointegration test results also confirmed that there was long run relationship between real GDP and government capital expenditure, for the period under study.

Worlu and Emeka (2012) conducted a study to investigate the impact of tax revenue on economic growth in Nigeria between 1980 and 2007, using three stage least square method. The results suggested that tax revenue positively influences economic growth through infrastructural development and foreign direct investment (FDI), but only by allowing infrastructural development and FDI to respond positively to an increment in output. The fact that tax revenue impacted economic growth positively, reflects consistency with the Keynesian theory which indicates that government revenue ought to influence economic growth positively, that is, if the tax revenue is treated as the functional fiscal policy instrument.

Odhiambo et al. (2013) investigated the impact of budget deficit on economic growth in Kenya between 1970 and 2007, using Dickey Fuller and ADF tests and Johansen cointegration test. The results revealed that fiscal deficit influenced economic growth positively. It was also concluded that the government should use a sustainable and transparent financial management so that it does not "crowds out" private investment. This results criticized classical economists' views but instead favored Keynes's views on government intervention.

Canicio and Zachary (2014) employed vector error correction model (VECM) to study the causal relationship between government tax revenue growth and economic growth between 1980 and 2012. Among the fundamental findings, it was found that there is an independent relationship between economic growth and total government tax revenue with 30 percent speed of adjustment in the short run. The study has also showed evidence of a long run relationship between these two variables. This result, in short, confirms Keynesian theory.

Yi and Sunyono (2014) studied the association between tax revenue and economic growth in the Hebiei province of China between 1978 and 2011. The results suggested that tax revenue maximization did not explain maximization of GDP. To analyze the negative relationship between economic growth and tax, tax multiplier was used as an input in the polynomial distributed lag (PDL) model. The results also revealed that the tax revenue and economic growth were negatively related, and tax cuts would impact Hebiei province of China positively. This results complement Keynes's view which states that an increase in tax rate would affect private consumption negatively which would in turn cause a decline in the rate of economic growth.

Navaratnam and Mayandy (2016) conducted a study to examine the effect of fiscal deficit on economic growth in some selected Asian countries such as Bangladesh, India, Nepal, Pakistan and

Sri-Lanka, using annual time series data between 1980 and 2014. Cointegration and Granger causality tests were used. The results revealed that fiscal deficit has a negative impact on economic growth except for the case of Nepal which confirmed a positive relation between fiscal deficit and economic growth. The results also indicated that the causality's direction for these countries was mixed, hence the fiscal deficit causes economic growth in Bangladesh, Nepal and Pakistan, whereas in India and Sri-Lanka economic growth is not caused by fiscal deficit. Hence, the results consistent with both Keynes and classical economists' views on fiscal policy.

Mohammed and Mahfuzul (2017) conducted a study to investigate the impact of fiscal deficit on economic growth in Bangladesh between 2000 and 2016 using quarterly time series data. The VECM model was utilized and the results indicated that there was a positive and significant relationship between fiscal deficit and GDP growth rate. In the short, the results complement Keynes's views on the public sector.

Dele (2007) conducted a study to investigate the monetary policy on West African monetary zone countries (Gambia, Ghana, Guinea, Nigeria and Sierra Leone) using generalized least squares (GLS) method. The scope of the study was between 1991 to 2004.Variables such as money supply (M2), minimum rediscount rate, banking system credit to private sector, banking system credit to central government and exchange rate of national currency to the US dollar were used in the study. Among the key findings of the study, it was found that monetary policy was a cause of stagnation as it had a negative impact on real GDP of these countries.

Berument and Dineer (2008) used structural VAR (SVAR) technique between 1986 and 2000 to study the effects of monetary policy for Turkey. The study revealed that a tight monetary policy had a temporary effect on real GDP, hence causing a decrease in real GDP for three months in a statistically significant fashion. The findings are also similar to that of Sousa and Zaghini (2008), Sims (1992), Eichenbaum and Evans (1995).

Frimpong and Oteng-Abayie (2010) used threshold regression models to estimate the thresholds for inflation in Ghana between 1960 and 2008. The results revealed that there existed a threshold effect of inflation on economic growth in the economy of Ghana. Hence, the results suggested that the level of inflation at which economic growth start to be negatively affected is 11 percent as a percentage of GDP. Fortunately, the target for inflation as proposed by the Bank of Ghana is 6 to

9 percent. This means that the threshold effect level estimated indicated that Ghana was moving in the right direction as far as the price stability objective is concerned, for the period under study.

Agbolnaje et al. (2013) employed the error correction model (ECM) using data between 1975 and 2010 to investigate the impacts of monetary policy on economic growth in Nigeria. The study revealed that there exists a long-term relationship among the variables. The study also showed that inflation and exchange rates as well as external reserve are significant monetary policy instruments that affected economic growth positively.

Olatunji et al. (2010) conducted a study to investigate the factors influencing inflation in Nigeria between 1960 and 2010. Cointegration technique was used. The results showed that total imports, government spending and money supply affected inflation positively in both the short and long run. This results simply confirm Keynesian and monetarists theories which in short advocate that inflation is necessary for faster economic growth.

Ali and Mim (2011) conducted a study to investigate the drivers of inflation in eight MENA countries between 1980 and 2009. The study relied on estimating techniques like system of generalized method of moments. The results indicated that there was a negative relationship between money supply growth and government expenditure against inflation. These results criticized monetarism/monetarists and Keynesian theories as far as inflation is concerned.

Arif and Ali (2012) utilized time series annual time series data between 1978 and 2010 to investigate short and long run determinants of inflation in Bangladesh. Johansen – Juselius cointegration method and the error correction model (ECM) were used. The results indicated that there was a positive influence between money supply, government spending and imports on inflation in the long run. This results seem to be complementing monetarism/monetarists and Keynesian theories which emphasize a positive relationship between money supply and government expenditure against inflation.

Pindiriri (2012) conducted a study to investigate the causes of inflation in the post dollarized Zimbabwe. Variables such as imports, consumer expectation about future inflation, exchange rate, interest rate, output growth and money supply were used as key variables. Among the fundamental findings of the study, it was found that the interest rate was statistically insignificant even though it was found to be the major determinant of inflation in Zimbabwe during the pre-dollarization

period. The study also suggested that consumer expectations about the future inflation, money supply, current exchange rate, and import value were the main contributing factors affecting post-dollarization inflation.

Ellyne and Daly (2013) used vector error correction model (ECM) to investigate the exchange rate-inflation spiral between 1998 and 2012. The study further explored the determination of the exchange rate and tested the PPP hypothesis. It was found that PPP held for the official exchange rate not the parallel exchange rate, hence providing evidence of the structural change of the economy. Causality test was used against the key variables such as money supply, inflation and the exchange rate to get more insight on the effect of monetary policy. The study has found that monetary policy has not improved Zimbabwe's economy for the period under study.

Oteng-Abayie and Doe (2013) applied the Generalized Autoregressive Heteroscedasticity (GARCH) model to investigate the association between inflation and inflation uncertainty for the period 1984 to 2011. The CPI was used as the proxy variable for inflation. The results suggested that at a time when inflation is high, inflation uncertainty also increases which in turn causes inflation. Hence, attacking inflation uncertainty prompts reduction of inflation.

Sola and Peter (2013) conducted a study and utilized annual time series data between 1970 and 2008, to investigate the determinants of inflation in Nigeria. Vector Auto Regression (VAR) model was used to estimate the results. The results indicated that money supply was positively related to inflation whereas government spending had a negative relationship to inflation. The results complement monetarism/monetarists theory as far as inflation is concerned. However, the results again contradict Keynesian theory but complement classical economics theory as far as government spending is concerned.

Fernald et al. (2014) conducted a study to investigate the effectiveness of monetary policy in China between 1980 and 2012, using annual time series data and Vector Auto Regression (VAR). The study indicated that an increase in bank reserve requirements reduces economic activity and changes in interest rate also have an effect on economic activity and price level. These results complement the monetarism theory as fully discussed in the previous section.

3.3.1.1 An analysis developing economies empirical literature on fiscal and monetary policy

In comparing and contrasting the above empirical analysis, the study of Mansouri (2008), Sikuru et al. (2010), Fatima et al. (2011), Mohanty (2012), Navaratman and Moyandi (2016) and Odhiambo et al. (2013) established a significant and positive long and short (some of them) relationship between government expenditure and economic growth. These studies established this relationship for the case of Egypt, Morocco, Tunisia, Nigeria, India and Kenya. However, the study of Munongo (2012) established a significant and negative relationship between government expenditure, revenue and economic growth in a case of Zimbabwe. As far as government revenue is concerned, only the study of Worlu and Emeka (2012) established a positive and a significant relationship between government revenue and economic growth in a case of Nigeria. The remaining studies established a negative and significant sometimes insignificant relationship between government revenue and economic growth. In general, the empirical relationship for government expenditure and revenue against economic growth as proposed by the gathered empirical literature has been positive and negative respectively in developing economies.

In terms of the monetary policy, the majority of studies established positive relationship between inflation and economic growth as most of the developing economies experience higher inflation to make a room for a sustained economic growth and development. However, the study of Sola and Peter (2013) established a negative relationship between inflation and government expenditure growth but positive relationship between money supply and inflation in Nigeria.

3.3.2 An Overview of Studies on fiscal and monetary policy in developed economies

Blanchard and Perotti (2002) employed Structural VAR (SVAR) to investigate the impacts of fiscal policy through fiscal policy instruments on economic growth between 1947q1 and 1997q4 in the United States of America. It was found that government spending has impacted the economy positively, and it was also found that crowding out of private investment was due to positive shocks in government spending and revenue. In short, the results complement Keynes's views on the public sector intervention through government spending. However, the results also reflect classical economists' views on the side that positive shocks on government spending crowds out private investment.

Heppke-Falk et al. (2006) used annual time series data in Germany. It was found that government expenditure and GDP growth rate were positively related. It was also found that government expenditure and private consumption were positively related. However, the effect of both government expenditure and private consumption on GDP growth rate was relatively small. Regardless of the magnitude of the effect of both government expenditure and private consumption on GDP growth rate, the results complement Keynes's views on the public sector.

De Castro Fernandez and Hernandez De Cos (2006) utilized annual time series data between 1990 and 2005, and SVAR technique to investigate the economic effects of exogenous fiscal shocks in Spain. Among the fundamental findings of the study, it was found that public spending was positively related to economic growth in the short run. In the medium and long term, it was found that expansionary public expenditure shocks only led to an increase in inflation and lower GDP growth. In analyzing the results, short run results reflect Keynes's view, which suggest that public expenditure ought to influence economic growth positively. However, long run results contradict Keynes's view but confirm classical economists' view which in short states that government intervention lead to inefficiencies.

Giordano et al. (2007) conducted a study to investigate the impact of fiscal policy on economic growth in Italy between 1982q1 and 2004q4. Structural VAR (SVAR) was used as the key technique. Variables such as government spending, government revenue, real GDP, inflation and long-term interest rate were used. Among the fundamental findings, it was found that positive shocks to government spending lead to positive impact on real GDP, employment, private consumption, investment and inflation. It was also found that positive shocks in government revenue had insignificant effects on all selected variables. This results reflect both Keynesian and classical economics schools of thoughts. First, the fact that positive shocks on government spending led to positive influence on employment, private consumption, investment and real GDP reflect Keynes's views of fiscal policy. Lastly, the positive influence on inflation due to positive shocks on government spending reflect the classical economists' point of view.

Giordano et al. (2007) utilized annual time series data and VAR framework between 1990 and 2005, to investigate the effect of fiscal policy variables on economic growth in Italy. The results indicated that government spending had a positive and consistent influence on GDP growth rate and private consumption for the period under consideration. This results are consistent with

Keynesian theory for fiscal policy which states that the impact of government spending on economic growth should be positive.

Ricardo and Fardmanesh (2007) investigated the impact of the key fiscal policy variables on economic growth using a reduced form model and panel data wherein 76 developed economies were sampled. The study covered the period of 1981 to 2005. The results revealed that the taxes were negatively associated with GDP, whereas government expenditure was positively associated with economic growth, for the period under study. This results are consistent with Keynesian theory for fiscal policy which states that the impact of government spending on economic growth should be positive. Keynes also argued that an increase in tax rate would affect private consumption negatively which would in turn cause a decline in the rate of economic growth.

Poulson and Kaplan (2008) undertook a study to examine the effect of tax policy on economic growth in the United States using endogenous growth model framework. Annual time series data between 1964 and 2004, and regression analysis were used in the study. The study suggested a significant negative relationship between tax rates and economic growth, for the period under consideration. This result complements Keynes's view which states that an increase in tax rate would affect private consumption negatively which would in turn cause a decline in the rate of economic growth.

Reade and Sthe (2008) conducted a study to investigate the interaction of fiscal and monetary policy and its impact on economic growth in the United States between 1960 and 2005. VAR methodology was used. The results indicated that fiscal policy had ensured the debt sustainability in the long run by responding to an increment in debt in such a way that the magnitude of the effect was moderate. Nevertheless, discretionary fiscal policy did not prompt a countercyclical trend. Additionally, monetary policy was observed as that of Taylor's rule type which corrected the imbalance in both short and long run.

Bank (2011) used Structural VAR (SVAR) to investigate the impacts of fiscal policy on economic growth in Germany between 1991 and 2009. Variables such as real GDP, government spending, taxes, inflation and the interest rate were used. Among the fundamental findings, it was found that government spending has a positive shock on real GDP in the short run. This results are consistent with Keynesian theory for fiscal policy which states that the impact of government spending on

economic growth should be positive. It was also found that the shock of government revenue (taxes) on real GDP was insignificant for the period under study.

Afonso and Sausa (2012) employed Bayesian SVAR (B-SVAR) technique and quarterly time series data to investigate the impacts of government spending and revenue shocks on the compositions of GDP such as private investment and consumption as well as markets assets (stock and housing prices). Italy, Germany, UK and United States of America were sampled for the period of 1964q1 to 2007q4. The study also included a debt feedback component to account for the government intertemporal budget constraint. Results showed that positive government spending shocks have a small but positive effect on GDP. The effect of expansionary fiscal policy on private consumption and investment differed across the sampled countries but had a positive effect on housing prices, price level and average costs of refinancing debt. Government revenue, GDP and private investment were found to be positively related but varied effect on private consumption and housing prices. The study further revealed a mixed effect on the interest rates but no impact on the price level. Accounting for the debt feedback, it was found that long term interest rate and GDP became more responsible for the shocks in fiscal policy whereas the impact of fiscal policy on macroeconomic variables was more persistent.

Hassen et al. (2014) conducted a study to investigate the effect of government deficit spending on GDP in the United States between 2000 and 2013 using quarterly time series data. The results indicated that government deficit spending had a negative impact on GDP, whereas unemployment had a negative impact on GDP in the presence of the fiscal deficit spending. This results reflect the classical economists' point of view as far as fiscal policy is concerned.

Cinar et al. (2014) conducted a study sampling the best and worst five countries in the Eurozone according to their respective debt ratios, growth rates and budget deficits. The study covered the scope between 2000Q1 and 2011Q4. The main focus was on the recent recession that took place between 2007 and 2009. Panel ARDL technique was used. The results revealed that conjectural deficit policy influenced economic growth positively in the short run. This results are consistent with Keynesian theory for fiscal policy which states that the impact of fiscal deficit on economic growth should be positive as long as the economy has cognitive and sustainable public debt management.

Starr (2005) conducted a study to investigate the relationships between monetary policy instruments and real GDP in the post-stabilization period. Four main CIS countries namely: Russia, Ukraine, Kazakhstan and Belarus were sampled for the period of 1995 to 2003 using quarterly data. Granger Causality test was used as the key technique. Little evidence of the real effects of monetary policy in these four countries on real GDP was found. The findings are like those of Uhlig (2005) whose findings indicated that contractionary monetary policy shocks on real GDP in the United States had no clear effect.

Rafiq and Mallick (2008) used the new VAR identification procedure to examine the impacts of monetary policy on real GDP in three-euro area economies (Germany, France and Italy). Quarterly data was used between 1981 and 2005. It was found that monetary policy innovations were at their most potent in the case of Germany. Excluding Germany, whether an increase in the interest rates lead to a decline in real GDP remained ambiguous. As a result, the responses showed a lack of homogeneity.

Bhuiyan (2008) conducted a study to investigate the impact of monetary policy shock in Canada using SVAR. Variable overnight target rate was used as the policy instrument with monthly data between 1994 and 2007. It was found that the transmission of the monetary policy shock to real GDP functions through both the interest rate and the exchange rate.

Bhattarai (2011) conducted a study to investigate the effect of exchange rate and money supply on output, inflation and interest rate in the UK. The study utilized annual time series data between 1990 and 2010, and Vector Error Correction Model (VECM). The results indicated that depreciation of sterling and a higher interest rate influenced economic growth negatively. This results reflect the monetarists' point of view which in short states that an increase in the interest rate affects money supply negatively which consequently impacts economic growth negatively.

Using money supply as the key measure of monetary policy, Nouri and Samimi (2011) conducted a study to investigate the impact of monetary policy on economic growth in Iran employing ordinary least squares (OLS) technique between 1974 and 2008. The relationship between monetary policy and economic growth was found to be positive and significant. This result reflects the consistency of monetarism theory which states that positive shocks in money supply lead to positive shocks in economic growth rate.

Daly (2015) conducted a study to examine the coordination of monetary and fiscal policies in France between 1980 and 2014. Using the Granger method, the results indicated that monetary policy drove the economy to growth more than fiscal policy. The capacity of the government to finance the budget deficit was affected by the particular monetary policy reform for the period under study.

3.3.2.1 An analysis of developed economies empirical literature on fiscal and monetary policy

On the above empirical analysis, as far as the fiscal policy is concerned, the studies of Blanchard and Perotti (2000), Heppke-Falk et al. (2006), Giodano et al. (2007), Bank (2011) and, Afoso and Sausa (2012) established positive and negative relationship for government expenditure and government revenue respectively on economic growth in the case of the United States of America, Germany, France, Italy and United Kingdom. That is, government expenditure and government revenue have positive and negative relationship on economic growth respectively in developed economies based on the empirical evidence gathered in this study.

In terms of the monetary policy, the empirical evidence presented by the study of Rafiq and Mallick (2008) shows that monetary policy was most potent in Germany compared to Italy and France. Furthermore, it could not be found whether an increase in the real interest rates led to a decrease in real GDP in Italy and France, for the period under consideration.

In a case of United Kingdom, the study of Bhattfarai (2011) shows that an increase in real interest rate affected economic growth negatively and furthermore, the depreciation of UK currency also affected economic growth negatively. As far as the United States of America is concerned, the study of Nouri and Samimi (2011) and Cinar et al. (2014) show that a positive change in money supply and an increase in the real interest rate affected economic growth positively and negatively respectively. That is, real interest rates and depreciation of currency have negative relationship on economic growth whereas money supply affects economic growth positively in developed economies based on the empirical evidence gathered in this study.

3.4 EMPIRICAL EVIDENCE FROM THE STUDIES CONDUCTED ON THE CASES OF THE SACU MEMBER ECONOMIES

3.4.1 An overview of empirical literature on fiscal and monetary policy across SACU member economies

3.4.1.1 Empirical evidence from the studies conducted on fiscal and monetary policy in South Africa

Abdullah (2006) found that the degree of government expenditure is critical in the economy's performance management in South Africa. In additional to these findings, it was recommended that every legislature should not focus only on supporting and inspiring the private sector to secure economic growth, but it should look for sustainable means of expanding the budget for infrastructure, social and other economic elements that are significant parts of economy.

Du Plessis et al. (2007) conducted a study to discuss the cyclicality of fiscal and monetary policies in South Africa since democracy. Among the fundamental findings of this study, it was found that there is a growing consensus that monetary policy has impacted the economy remarkably well as far as stabilization of the economy is concerned over the period of 1994 to 2006. However, the role of fiscal policy was not effective in stabilizing the economy, and the study has also revealed that there is a little evidence that counter-cyclical fiscal stance was prioritised over this period. The model confirmed the consensus on monetary policy whereas on the fiscal policy, pro-cyclicality through the policy simulations which implies the pro-cyclicality of fiscal policy has had little impact on real GDP as far as destabilizing is concerned.

Ocran (2011) conducted a study to investigate the impact of fiscal policy on economic growth in South Africa between 1990q1 and 2004q4. Vector auto regression (VAR) modelling technique was used in this study. Government gross fixed capital formation, tax expenditure, government consumption, budget deficit and real GDP were used as the key variables. The results indicated that government consumption, expenditure and gross fixed capital formation have a positive effect on economic growth. The findings also indicate that positive shocks to tax receipts have a positive impact on economic growth. These results complement Keynes point of view which advocates for fiscal policy as one of the drivers of economic growth.

Jooste et al. (2012) conducted a study to seek empirical evidence on the effects of fiscal policy shocks in South African economy. The results indicated that increasing tax causes a decrease in

GDP in the short term, while in the long term effect is negligible. It was also found that an increase in tax sometimes produced positive effects in the short run, while in the long run the effect was not significant for the period under study. This results complement Keynes's view which states that an increase in tax rate would affect private consumption negatively which would in turn cause a decline in the rate of economic growth.

Mujuta (2013) applied SVAR model to investigate the response of economic growth to fiscal deficits in South Africa. The results indicated that there was a negligible response of economic growth to fiscal deficits, for both short and long run, which implied that discretionary fiscal policy was not an effective economic growth driver in South Africa for the period under study.

Calitz et al. (2016) conducted a study to investigate the enhancement of the accuracy of fiscal projections in South Africa between 2000/1 and 2010/11. The results indicated that the credibility of fiscal policy would have been verified if the biggest error with regard to the numerous aggregates had coincided.

Leshoro (2017) conducted a study to analyze the effects of disaggregated government expenditure on economic growth in South Africa between 1976 and 2015, using ARDL technique. The results indicated that the disaggregated government expenditure was positively influencing economic growth in both the short and long run, for the period under consideration. This results are in consistent with Keynesian theory for fiscal policy which states that the impact of government spending on economic growth should be positive.

Mboji (2017) undertook a study to investigate the effects of the tax burden on long run economic growth sampling BRICS economies between 2000 and 2012, using panel data methods such as fixed effects model, random effects model and the pooled regression model. The fixed model was chosen as the appropriate model. The model revealed that there was a positive tax effect on economic growth in BRICS economies for the period under study.

Hlongwane et al. (2018) investigated the impacts of fiscal policy on economic growth in South Africa utilizing VECM method, between 1960 and 2014. The results indicated that government tax revenue has a significant and long run positive influence on economic growth, whereas the government gross fixed capital formation and budget deficits influence real GDP growth rate negatively. This results are consistent with Keynesian theory for fiscal policy which states that the

impact of government spending on economic growth should be positive. Furthermore, the results also reflect the classical economists' point of view in terms of the budget deficit. The classical economists argue that permanent budget deficits influence economic growth negatively in both the short and long run.

Adusei (2013) conducted the study to investigate whether inflation in South Africa is a structural or monetary phenomenon using annual time series data between 1965 and 2006. Techniques such as cointegration analysis, fully modified ordinary least squares, two step least squares regression, error correction model (ECM) and pairwise Granger causality test were used. The study concluded that there was a negative relationship amongst variables M2 money supply, SA economy openness and government spending with inflation. Thus, it was concluded that inflation in South Africa for the period under study was a monetary phenomenon.

Chipote and Makhetha (2014) conducted a study to investigate the impact of monetary policy on economic growth in South Africa between 2000 and 2010. The Johansen cointegration test and the error correction model (ECM) were utilized to identify the long run and short run dynamics among the variables. Key variables like money supply, repo rate and exchange rate were found to be insignificant monetary policy instruments that push growth in South Africa whereas inflation was found to be significant. This results complement Keynes view which in short states that inflation is necessary for economic growth. However, the monetary authority should restrict inflation growth rate with a certain target interval which would be reasonable for economic growth.

Precious (2014) conducted a study to investigate the effect of monetary policy on enhancing economic growth between 2000 and 2010. Johansen cointegration and the VECM techniques were used to identify the short and long run dynamics among the variables. It was suggested by the results that money supply, repo rate and exchange rate had a positive effect on economic growth. This results are consistent with Keynesian theory for monetary policy and monetarism theory.

Matamilola et al. (2014) conducted the study on the impact of monetary policy on bank lending rate in South Africa between 1980 and 2013. This was done through investigating the long run interest rate pass-through of the monetary market to bank lending rate and asymmetric adjustment in the bank lending rate. The study utilized momentum TAR and asymmetric error correction models. The results indicated that the bank lending rate is vulnerable to a decrease in money supply

in South Africa. The results also suggest that South African commercial banks should adjust their lending rate downward.

3.4.1.2 Empirical evidence from the studies conducted on fiscal and monetary policy in Lesotho

Thamae (2013) investigated the dynamics of government spending in Lesotho using VECM between 1980 and 2010. The results indicated that government spending influenced economic growth positively, whereas tax share influenced economic growth negatively in the long run. These results are consistent with Keynesian theory for fiscal policy which states that the impact of government spending on economic growth should be positive. Keynes also argued that an increase in tax rate would affect private consumption negatively which would in turn cause a decline in the rate of economic growth.

Thamae and Macheli (2013) conducted a study to investigate the impact of public expenditure on private consumption in Lesotho between 1980 and 2010, using VECM method. The results revealed that government expenditure was positively related to private consumption, for the period under study. These results are consistent with Keynesian theory for fiscal policy which states that the positive shocks on government spending may lead to an increase in the level of private consumption, which in turn influences economic growth positively.

Molopo (2015) evaluated the effects of the factors affecting the public expenditure growth on infrastructure in Lesotho between 1980 and 2014, using the Engle and Granger (1987) method. The results indicated that there was a long run relationship among the variables. It was also found that the growth of public expenditure in Lesotho was determined by government revenue, grants and loans. However, the results did not show any evidence for the existence of an association between government expenditure and infrastructure.

Thabane and Lebina (2016) conducted a study to look for the long run and causal relationship between economic growth and government expenditure between 1980 and 2012, using ARDL bounds testing method. The results revealed that there was a stable long run association between government expenditure and economic growth in Lesotho. Nevertheless, the Granger causality test indicated that the direction was from economic growth to government expenditure, hence supporting Wagner's law in Lesotho for the period under study.

Thamae and Kolobe (2016) conducted a study to investigate the effects of foreign aid in Lesotho between 1982 and 2010, using VECM. The results indicated that there was a strong and negative relationship between recurrent expenditure and foreign aid in the long run. The results also indicated a marginal positive and significant association between aid and capital expenditure in the long term.

Mosikari and Eita (2017) tested the existence of Ricardian Equivalence hypothesis in the kingdom of Lesotho between (1980-2014) and (1988-2014) sample periods. ARDL method was used in the study and among the fundamental findings of the study, it was found that there was a long run relationship among the variables in both sample periods. The results also articulated that an increase in government debt decreased the household consumption per capita in Lesotho. This simply implies that the Ricardian Equivalence hypothesis did hold in Lesotho between 1980 and 2014.

Seleteng (2006) sought to estimate an optimal level of inflation in Lesotho between 1981 and 2004, using quarterly data and cubic interpolation technique. The results indicated that 10 percent optimal level of inflation was detrimental for economic growth in Lesotho, for the period under consideration. However, the estimated level was above the annual target rate of 3-6 percent.

Thamae (2014) undertook a study to investigate the main drivers of excess liquidity in the financial sector using VAR framework in Lesotho, between 1980 and 2013. The results suggested that excess liquidity in Lesotho's financial sector was driven by an under-developed financial sector. The banking sector in Lesotho was also found to be uncompetitive for deposits as constrained by wide intermediation difference contrasted to the rest of the common monetary area countries.

Thamae and Letsoela (2014) looked for an empirical evidence on the transmission mechanism between food and non-food prices in Lesotho utilizing VAR framework between 2003 and 2012. The results suggested that food inflation in Lesotho was more severe than non-food and headline inflation. Due to these results, it was recommended that the Lesotho monetary authorities have to be more careful when supply shocks hit food. The reason for this is because such shocks can be transmitted into non-food prices, hence putting more pressure on non-food core inflation.

Sekantsi and Kalebe (2015) conducted a study to seek for empirical evidence pertaining to the relationship among savings, investment and economic growth between 1970 and 2012, using

ARDL bounds testing procedure and VECM. The results suggested that there was a cointegration among the variables and causality from economic growth to savings in the short run. The results also indicated Granger causality from savings to economic growth in the long run. In addition, the results also revealed that there was an existence of short and long run causality flow from investment to economic growth. Hence, for the period under study, Lesotho's economic growth was driven by savings and investment. These results reflect Keynes theory of investments which in short states that positive shocks in investment lead to economic growth.

Seleteng et al. (2017) conducted a study to investigate the macroeconomic effects of fiscal policy on output gap in Lesotho between 1982 and 2015. Structural VAR (SVAR) framework was used in the study. It was found that a positive shock to government expenditure leads to a significant positive response inflation, but the impact on other variables is insignificant. A positive shock to government revenue has no impact on the output and interest rate but consequently causes an increase in consumer prices, government expenditure as well as private and public fixed capital formation. This results reflect Keynes views which in short suggest that an increase in taxes (fundamental source of government revenue) would affect private consumption negatively which would in turn cause a decline in the growth rate of economic growth and prompt a higher inflation rate.

3.4.1.3 Empirical evidence from the studies conducted on fiscal and monetary policy in Swaziland

Ayoki (2011) conducted a study to evaluate the stance of fiscal policy in Swaziland since the 1980's. The study revealed that Swaziland's fiscal challenges have significantly risen in part from the past 20 years. This includes slow economic growth and a decline in revenue obtained from SACU's pool. The collapse of fiscal discipline in Swaziland also contributed toward the significant rise in fiscal challenges. The results also indicated that if growth were to pick up, the government of Swaziland would have to restructure its tax system.

Ntshakala (2014) employed ordinary least squares (OLS) method using time series data from 1988 to 2013 to investigate the effects of public debt on economic growth in Swaziland. Among the key variables used in this study, inflation and government expenditure were used. The study showed that there is no significant relationship between external debt and economic growth in Swaziland for the period under study. Domestic debt was found to have a significant positive effect on

economic growth at 5 percent level of significance. This reflect Keynes's point of view as far budget deficit is concerned which suggests that public budget deficit ought to influence economic growth positively.

Nxumalo and Hlophe (2018) undertook a study to assess the sustainability of fiscal policy in Swaziland between 1980 and 2016, using Trechan and Walsh methodology as well as Hakkio and Rush methodology. The results indicated that Swaziland is on an unsustainable path with main gap and tax gap of 7 percent as percentage of GDP that has to be carefully corrected. The results also show evidence of weak sustainability in the long term. This is due to the fact that public expenditure rises at a rate that is higher than that of the revenue which in turn makes the budget deficit to be unsustainable in the medium term.

Ndzinisa and Sithole (2018) conducted a study to determine an optimal level where public debt is at its peak, hence the threshold level of public debt which reduces economic growth in Swaziland. The methods such as non-linear quadratic threshold model and generalized method of moments (GMM) were used in the study. The results reveal that there is an existence of a non-linear hump-shaped association between public debt and economic growth. The level of public debt at which economic growth starts to be negatively impacted is estimated at 46 percent as a percentage of GDP. It has been learnt that the estimated threshold level has not been surpassed in the past, even the level that has been set by the government of Swaziland (35 percent) and the World Bank for developing economies (40 percent).

Dlamini (2018) conducted a study to seek to estimate and analyze fiscal multipliers in recessions and expansions in Swaziland, between 1980 and 2016, using SVAR model and multivariate threshold autoregressive (MTAR). The results indicate that there is a long run relationship among the variables. The response of GDP is found to be insignificant to revenue but positively significant to government spending (in consistent with Keynes's point of view on government spending) using impulse response functions. As far as the linear multipliers are concerned, the results indicated that for the accumulated multipliers, a positive lilangeni shock in government spending brings 20 cents to GDP in a 10 years' period in contrast to 11 cents for lilangeni shock in revenue. Hence, the overall results indicate that authorities should channel much of government expenditure to capital projects, especially in recession periods.

Ndzinisa (2008) conducted a study to study the efficacy of monetary policy on economic growth in Swaziland between 1980 and 2006 using the Engle Granger cointegration test and error correction model (ECM). The study indicated that real GDP is influenced by amongst other variables, interest rate, exchange rate and credit extension. The study has also established that credit extension has a temporary negative impact on real GDP but with a positive long run impact.

Dlamini et al. (2018) conducted a study on a twofold analysis of the effectiveness of Swaziland's monetary policy and an examination of the common monetary area (CMA) as an optimal currency area, using SVAR method. The results suggest that demand shocks through consumer price index (CPI) are not much related among the CMA economies, rather, they have moved around that of South Africa since it is an anchor economy. The impulse response functions results indicate that a shock on a discount rate has a negative impact on real GDP, inflation and M2 money supply. Hence, the results show evidence of the efficacy of Swaziland's monetary policy.

Kunene and Mdladla (2018) investigated the impact of monetary policy changes on budget deficit, tax revenue and domestic public debt in Swaziland using SVAR methodology. Discount rate, liquidity requirement and reserve requirement were utilized as monetary policy rates. The results through impulse response functions and variance decomposition reveals that all policy rates did not impact fiscal variables significantly for the period of about two years. The variance decomposition results showed that a shock on the discount rate can cause a 2.9, 1.4 and 1.5 percent variation on government deficit, tax revenues and domestic public debt respectively for the period of two years.

3.4.1.4 Empirical evidence from the studies conducted on fiscal and monetary policy in Botswana

Bonu and Pedro (2009) applied ordinary least squares (OLS) method and quarterly data between 1996 and 2008, to study the effect of income tax rates on the economic development of Botswana. The results indicated that low income tax rates boosted Botswana's economic growth, for the period under study. This results reflect Keynes's views which in short state that an increase in tax rate would affect private consumption negatively, which would in turn cause a decline in the growth rate of economic growth.

Taye (2011) conducted a study to investigate the sustainability of Botswana debt using variables such as accumulated domestic debt, accumulated foreign debt, primary government balance,

seigniorage revenue and nominal interest rate for both domestic and foreign debts between 2009 and 2017 using quarterly data. Among the fundamental findings, it was found that Botswana should not be concerned about debt sustainability in the short run to medium term as long as the economy bounces back to its normal level. These results reflect the classical economics approach where it is believed that the economy drives itself back to natural equilibrium without any public sector intervention.

Galebotswe (2012) conducted a study to analyze the macroeconomic fluctuations in Botswana. The results suggested that output is more volatile in Botswana than in industrialized economies. The results also revealed that exports were the most volatile composition of aggregate spending. It was also found according to the study that the world oil prices, monetary aggregates, prices and nominal exchange rate were the major sources of macroeconomic fluctuations in Botswana.

Koitsiwe and Adachi (2015) employed unrestricted vector autoregression (VAR) method to investigate the dynamic relationships among the variables mining revenue, government consumption, exchange rate and economic growth in Botswana between 1994 and 2012. The results indicate that mining revenue and exchange rate Granger cause economic growth while government consumption is Granger caused by mining revenue and economic growth. The results are in consistent with Keynes view where the revenue and exchange rate play a very cognitive role in driving economic growth.

Sukumaran Nair (2016) conducted a study to determine the macroeconomic factors that drive economic diversification in Botswana. Variables such as GDP growth rate, mining output as percentage of GDP, ratio of gross fixed capital formation to GDP, ratio of public spending to GDP, tax revenue as the percentage of GDP, inflation, terms of trade (proxy variable for economic trade openness), ratio of FDI to GDP and exchange rate were utilized in a multivariate regression model. The results indicated that mining share contributed more compared to other drivers, hence mining seemed to be the driver of the restricted economic diversification in Botswana. Additionally, share of taxes, GDP growth rate and exchange rate were also found to be significant drivers at 5 percent level of significance. In other words, fiscal and monetary policies were also marginal drivers of economic diversification in Botswana for the period under consideration.

Mbulawa and Chingoiro (2017) employed ARDL bounds testing method, pairwise Granger causality and annual time series data to investigate the short and long run relationship between

fiscal policy instruments and economic activity, for the period 1975 to 2014. The results articulated that there was a non-linear, hump-shaped relationship between education expenditure and economic activity in both the short and long run. Tax had a significant negative influence on economic activity while the causality direction moved from economic activity to tax. It was recommended that government should increase the flow of non-tax incomes into treasury. This results reflect Keynes views where it is believed that an increase in tax results in a significant decline in private consumption which directly hinder economic growth.

Galebotswe and Tlhalefang (2012) conducted a study to investigate the impact of monetary policy shocks on stock returns in Botswana between 1993 quarter one and 2010 quarter four, using VAR methodology. Changes in the 91 day Bank of Botswana Certificate rate was used as the proxy variable for the monetary policy. Results indicated that aggregate stock returns in the Botswana Stock Exchange (BSE) were positively associated with positive interest rate innovations. This was due to the fact that the market capitalization in the BSE was mostly dominated by commercial banks. This positive association implies that an increase in returns to banks' stock discouraged the negative responses of non-bank stock returns. It was also shown through variance decomposition that monetary policy shocks explained a small share of stock returns variation, for the period under study.

Kebrettaye (2012) used auto regression distributed lags (ARDL) estimation technique to analyze the determinants of inflation in Botswana between 1990q1 to 2010q4. Price inertia, real GDP, money supply and South African prices were used as the key variables in the study. The study indicated that all the key variables mentioned above play a dominant role in determining the rate of inflation in Botswana.

Munyengwa (2012) employed vector autoregression (VAR) modelling methodology to study the effectiveness of monetary policy on economic growth between 1995q1 and 2009q4 in Botswana. The results indicated that monetary policy is most effective via the interest rate channel followed by credit channel and exchange rate channel. Results reflected that the economy reacted to monetary policy measures with one period lag for the period under study, with the impact lasting for seven quarters.

Muyambiri and Odhiambo (2017) undertook a study to examine the effect of both bank based and market based financial development on investment in Botswana between 1976 and 2014, using the

ARDL bounds testing method. The results suggested that in both the short and long run, bank-based financial development was positively related to investment in Botswana, whereas market-based financial development has an insignificant effect on investment (either in the short or long term).

3.4.1.5 Empirical evidence from the studies conducted on fiscal and monetary policy in Namibia

Kaakunga (2006) conducted a study to evaluate the impact of the fiscal policy on economic growth in Namibia between 1980 and 2005, using endogenous growth models framework. The results indicated that a change in a mix of public expenditure in favour of productive activities lead to a steady-state growth rate in Namibia. The results also indicated that the portion of private consumption in GDP, fiscal deficit, the portion of total public debt in GDP and expenditure are negatively associated with the growth rate of output. This results reflect the classical economics' view which in short states that both budget and fiscal deficits influence economic growth negatively.

Chiriparihura and Chifamba (2015) applied computable generalized equilibrium (CGE) model to examine and quantify the wide equity and distributional effects of Namibia's tax policy reform which was introduced in 2013. The results suggested that the impacts of reduced personal and corporate taxes were different across institutions and markets. For the consumers, tax cuts directly increased consumers' disposable incomes. The tax reform also caused Namibia's currency to depreciate, hence improving exports competitiveness. Above all, the tax changes seemed to back the Namibia's policy of promoting manufacturing activities.

Nkhalamo and Sheefeni (2017) undertook a study to analyze the association between taxation and economic growth in Namibia between 2001 and 2015. Quarterly data and time series techniques such as unit root, cointegration, impulse response functions and variance decompositions were used within VAR methodology. Among the key findings, it was found that there was no long run association among the variables which prompted not the analysis for the long run period. However, in the short run, through impulse response functions it was found that an immediate negative impact on economic growth was due to the shock in tax. In addition, the variance decomposition suggested that tax was for the most part responsible for the moderate shocks in Namibia's economic growth, for the period under study. These results reflect both Keynes and classical

economists' views on taxation where economic growth is believed to be affected negatively if tax rates would be increased.

Goamab (1998) utilized a combination of econometric modelling techniques such as cointegration, error correction model and structural stability testing, to study inflation in Namibia between1974 and 1996. The study indicated that inflation was highly influenced by external factors in both the short and long run.

Obdaba and Eita (2010) also conducted a study to investigate possible factors causing inflation in Namibia between 1972 and 2008. Augmented Dickey Fuller (ADF) stationarity and cointegration tests were utilized in the study. The results indicated that money supply and imports influenced inflation positively for the period under consideration. This results reflect monetarists and Keynes's views on inflation. Monetarists believe that there is a direct relationship between money supply and inflation, where too much money supply results in positive shocks in inflation. As far as Keynes is concerned, an increase in imports results in "imported inflation" from trade alliance(s) which leads to an increase in the domestic inflation.

Sunde (2011) used ordinary least squares (OLS) method to study and test the hypothesis that inflation is mainly influenced by imports between 1980 and 2007. The results showed that money supply and imports explained inflation significantly in Namibia, for the period under study. This result reflects monetarists' and Keynes's views on inflation. Monetarists believe that there is a direct relationship between money supply and inflation, where too much money supply results in positive shocks in inflation. As far as Keynes is concerned, an increase in imports results in "imported inflation" from trade alliance(s) which leads to an increase in the domestic inflation.

Undji and Kaulihowa (2015) conducted a study to investigate the determinants of inflation in Namibia using a cointegration approach between 1993 and 2013. Among the fundamental findings of the study, it was found that inflation was for the most part influenced by imports and government spending for the period under study. This results reflect Keynes's views on inflation. Keynes emphasized that an increase in imports results in "imported inflation" from trade alliance(s) which lead to an increase in the domestic inflation. As far as the government spending is concerned, an increase in government spending prompts general prices to increase. Due to this, higher interest rates in the financial market will be realized and subsequently, inflation will increase.

3.4.2 An analysis of SACU member economies empirical literature

In terms of fiscal policy, the relationship between government expenditure and economic growth is found to be positive in all SACU member economies as per study of Ocran (2011), Thamae (2013), Ntshakala (2014), Bonu and Pedro (2009) , and Chiripahura and Chifamba(2015). As for the effect of government revenue on economic growth in SACU region, there has been a mix effect as per gathered empirical literature. The studies that have established positive relationship between government revenue and economic growth include Mboji (2017), Hlogwane et al. (2018), Jooste et al. (2012) and Thamae (2013) in the case of South Africa, Lesotho, Botswana and Namibia. Contrary to the findings of these studies, Mbulawa and Chingoiro (2017), Koitsiwe and Adachi (2015) and Nkhalamo and Sheefeni (2017) found government revenue to be negatively related to economic growth in the case of South Africa, Lesotho, Swaziland, Botswana and Namibia. In general, the effect of government expenditure on economic growth in SACU member economies has been positive whereas that of government revenue on economic growth has been mixed.

In terms of the monetary policy, most of the empirical literature that has been gathered indicates that inflation has been affecting economic growth positively as the SACU member economies channeled their monetary policy into achieving price stability. That is, Inflation targeting is a framework that has been adopted by these economies to attain sustainable economic growth. It is for this reason that most of empirical literature on these economies is based mostly on inflation than other associating monetary policy variables. Furthermore, there are studies that established positive relationship between money supply and economic growth, and negative relationship between interest rate, exchange rate and economic growth. These studies include that of Precious (2014), Chipote and Makhetha (2014), Seleteng et al. (2017), Ndzinisa (2008) and Obdaba and Eita (2010) in the case of South Africa, Lesotho, Botswana, Swaziland and Namibia respectively.

3.5 CONCLUSION

This chapter explored the theoretical and empirical literature underpinning the study. In terms of fiscal policy, Keynesian and classical theory were fully discussed. In short, Keynesian theory motivates that government spending and taxation can be used by government authorities to influence the economy. Contrary to this, classical economists discouraged government intervention through government expenditure and taxation, and claimed that the economy drives itself back to equilibrium through market forces or mechanisms.

In terms of monetary policy, monetarism and monetarists theory emphasize that price stability maintenance and money supply shocks are the important and essential determinants of faster economic growth. Additionally, the quantity theory of money which complements monetarists' theory, emphasizes that as money supply grows at the fixed percentage tied to nominal GDP yearly, inflation will be lowered hence prompting the economy to grow steadily. On the other hand, the Keynesian theory of money stresses the issue of output rather than price stability maintenance as Keynes argued that interest rate, aggregate demand, level of employment, output and income are vulnerable to shocks in the money supply.

As far as economic growth is concerned, Adam Smith in classical growth theory suggested that output depends on labour, capital and land. On the other hand, Keynes believed that output depends on national savings ratio and national capital output ratio. The new endogenous growth theory emphasizes technical progress resulting from utilization of capital stock, human capital and investment is an essential determinant of economic growth.

The empirical literature gathered from developing, developed and the SACU member economies have proved the implications and/or validity of the above discussed macroeconomic theories depending on the nature and structure of the economies.

CHAPTER FOUR

METHODOLOGY

4.1 INTRODUCTION

This chapter presents the methodology of the study including data analysis, model specification and definitions of variables to be used. The theoretical framework provided in chapter three is used as a guideline for analysis. The explanation of the variables as well as the type of the data to be used are described. Panel ARDL estimation technique as well the estimation tool to be utilized will be fully explored, followed by the residuals diagnostic tests to evaluate the PARDL model to be estimated.

This chapter unfolds the relevant techniques and tools that will be used to fulfil the objectives of this study. Informal unit root test will be used to visually inspect the key variables of this study for stationarity. For determining the order of integration of the key variables, both Levin, Lin and Chu (LLC) and Im, Peresan and Shin (IPS) unit root tests (formal unit root tests) will be utilized. To analyse the impacts of both macroeconomics policies (combined) on economic growth in SACU economies, PARDL technique will be employed.

In short, this chapter is divided into seven sections. These sections are model specification (section 4.2), definition and expected signs of variables (section 4.3), data sources and measures (Section 4.4), data analysis (Section 4.5), estimation techniques and tools (Section 4.6), modelling procedure (Section 4.7) and concluding remarks (section 4.8).

4.2 MODEL SPECIFICATION

Noman and Khudri (2015) conducted a study to investigate the impact of monetary and fiscal policy on economic growth in Bangladesh using line diagram and multiple linear regression models over the period of 1980 to 2012. Furthermore, Noman and Khudri (2015) utilized the following model as a guideline in their study;

$$RGDP_t = f(FP_t, MP_t) \tag{4.1}$$

Where RGDP denotes real gross domestic product, which is the proxy variable that is used to measure the economic performance or activity, and FP and MP denote fiscal and monetary policy

measures respectively. Noman and Khudri (2015) also acknowledged government expenditure (GEXP) and government revenue (GREV) as fiscal policy variables where exchange rate (ER), interest rate (INR), inflation (INF) and money supply measured by M2 are proxy variables for the monetary policy. The subscript (*t*) denotes time period. Consequently, the expanded model was specified as;

$$RGDP_t = \beta_0 + \beta_1 GEXP_t + \beta_2 GREV_t + \beta_3 INR_t + \beta_4 INF_t + \beta_5 ER_t + \beta_6 M2_t + \varepsilon_t \quad (4.2)$$

This study adopts and modifies the model presented by equation 4.2. Modification is done by adding additional a significant variable which is private investment (PINV), the reason being to test for the validity of the "crowding out effect" hypothesis. However, since this study is based on the SACU member economies, the following model represents modelling from country one to five hence $i = 1, 2\ldots,5$ and $t = 1980, 1981\ldots,2017$.

$$RGDP_{it} = \beta_{0i} + \beta_{1i} LGEXP_{it} + \beta_{2i} LGREV_{it} + \beta_{3i} LPINV_{it} + \beta_{4i} LINR_{it} + \beta_{5i} LINF_{it} + \beta_{6i} LER_{it} + \beta_{7i} LM2_{it} + \varepsilon_{it} \quad (4.3)$$

Equation 4.3 represents the fundamental model of this study that is to be estimated in logarithms (L). The logarithm operator is included as it has the advantage of stabilizing the variance of the lagged variable.

4.3 DEFINITION AND THE EXPECTED SIGNS OF VARIABLES

4.3.1 Real gross domestic product (RGDP)

Real GDP is an inflation adjusted estimation of economic output. It represents the total national output as if prices never go up or down, which gives a more practical evaluation of growth((Fourie and Burger, 2011). Fourie and Burger (2011) also states that there are four main components of GDP, which are private consumption, investment, government expenditure and net exports. Private consumption is the most essential driver of GDP growth. The variable real gross domestic product (RGDP) is treated as a dependent variable in this study.

4.3.2 Government expenditure (GEXP)

"Government expenditure is the acquisition of goods and services for current or future use" (Shim, 2003). As far as developing economies are concerned, the relationship between government

expenditure and economic growth is essential as most of them have experienced ever increasing levels of government expenditure. Using Keynesian simple macroeconomic model, an increase in government expenditure will increase gross domestic product holding all other factors constant, since it contributes to the current demand. Due to this, positive relationship between government expenditure (GEXP) and real gross domestic product (RGDP) can be expected.

4.3.3 Government revenue (GREV)

Government revenue refers to the money received by the government (Nkhalamo and Sheefeni, 2017). As an essential instrument for fiscal policy, its sources mostly constitute taxes levied on different kinds of incomes (consumers' gross incomes and gross profits by business corporates) and wealth accumulated by consumers, and profit maximizing corporates. Other sources of government revenue include income/profit made from state-owned corporates which are not subjected to taxation, revenue accumulated by the central bank and capital receipts which are normally received from the external loans and/or debts in the world financial markets (Nakale, 2015). Since the government utilize this revenue to improve and develop the economy, then the relationship between government revenue (GREV) and real gross domestic product (RGDP) should be positive.

4.3.4 Private investment (PINV)

Investment can be defined as the commitment of current financial resources in order to achieve gains in the future. It can also be defined as the buying of goods that are not consumed today but will be used to create wealth in the future or sold at a higher price for a profit (Fourie and Burger, 2011). The relationship to real GDP should then be positive.

4.3.5 Exchange rate (ER)

Exchange rate is defined as the price of one currency in terms of the other (Fourie and Burger, 2011). Currency appreciation occurs when domestic residents pay less units of their currency per unit of foreign currency which consequently impacts domestic economy positively in terms of greater capital flows and exports. On the other hand, the depreciation of currency implies that domestic residents pay more units of their currency per unit of foreign currency.

Depreciation also means domestic goods and services (exports) become cheaper to foreigners and imports become more expensive to locals which increases exports and lowers imports resulting in more GDP. However, the raw materials, technology and specialised machines for which there is no local production also become more expensive, which may result in imported inflation, therefore the relationship of exchange rate (ER) to real gross domestic product (RGDP) should be either positive or negative.

4.3.6 Interest rate (INR)

An interest rate is the rate charged as the proportion of the amount that has been borrowed or deposited. In short, it is the rate that is charged by the bank or other lender to borrow its money. It can be also defined as the rate a bank pays its savers for saving money in an account (Fourie and Burger, 2011). However, as per monetary policy objectives, an interest rate in this study will be viewed as the rate that is charged by the bank (central or commercial) to lend money to its borrowers (opportunity cost of holding money). Hence, the relationship between interest rate (INR) and real gross domestic product (RGDP) should be negative.

4.3.7 Inflation (INF)

Inflation refers to a sustained increase in the general price level of goods and services in an economy at the specific time and is normally computed through consumer price index (CPI) (Fourie and Burger, 2011). Due to increasing levels of government expenditure, demand for goods and services increases which consequently increases the level of general prices. However, the policy makers target the rate of inflation within a certain interval since in developing economies inflation is necessary for faster economic growth. Due to this, the relationship between inflation (INF) and real gross domestic product (RGDP) should then be positive.

4.3.8 Money supply (M2)

M2 money supply refers to the measure of money that incorporates all essentials of M1 money supply as well as savings deposits, market securities, mutual funds and other time-to-time deposits (Fourie and Burger, 2011). As per monetarists' economics, an increase in money supply will increase economic activity in the economy, therefore the relationship between money supply (M2) and real gross domestic product (RGDP) should be positive.

4.4 DATA SOURCES AND MEASURES

4.4.1 Data Sources

Yearly data for the variables indicated in the model represented by equation 4.2 which was originally developed by Noman and Khudri (2015) as fully discussed in section 4.4, was collected from the South African Reserve Bank (SARB), the Organization for Economic Cooperation and Development (OECD), the International Monetary Funds (IFM) and the World Bank. SACU economies such as South Africa, Lesotho, Swaziland, Botswana and Namibia will be sampled for the period of 1980 to 2017 (panel data).

4.4.2 Data Measures

The following table presents the measures for the key variables of this study;

Table 4.1 Measures for the key variables

Variable	**Measure**
Economic growth (GDP)	Real gross domestic product (RGDP)
Government expenditure (GEXP)	Percentage of the GDP
Government revenue (GREV)	Percentage of the GDP
Private Investment (PINV)	Millions of US Dollars
Interest rate (INR)	Annual real interest rate
Inflation (INF)	Annual inflation rate
Exchange rate (ER)	Annual official exchange rate
Money supply	M2 money supply as the percentage of the GDP

4.5 DATA ANALYSIS

This study relies on the mixture of both time series and cross section (panel) data for the period of 1980 to 2017. Like any other type of data analysis, panel data analysis has advantages and disadvantages, which are fully explored as follows…

4.5.1 Advantages of panel data analysis

a. Estimated model parameters inference is more appropriate.

In most cases panel data is characterized by an extensive degree of flexibility and ability to change sample than cross sectional data which can be represented as a panel when T = 1, or N = 1 (time series data), subsequently enhancing the power and reliability of econometric estimations and evaluations (Hsiao et al., 1995).

b. More noteworthy reliability of capturing the unpredictability of human behaviour than a solitary cross-sectional or time series data.

- Building and testing more muddled behavioural hypotheses

Ben-Porath (1973) conducted a survey wherein it was demonstrated that married women from different sample units were found to have a normal annual labour force cooperation rate of 50 percent. This could be the result of random draws from a homogeneous population or could be draws from heterogeneous population in which half were from the population who dependably work and half who never work. In the event that the sample was from the latter, there is no turnover. The present data about a woman's work status is an ideal indicator of her future work status. A cross-sectional data cannot recognize these two potential outcomes, however, panel data can recognize these outcomes on the grounds that the consecutive observations for various women contain data about their work in different sub-intervals of their life cycle.

- Controllability of the effects of the omitted variables

It has been argued much of the time that the genuine reason for an existence of some factors is because of overlooking the impacts of specific variable under the model that has been specified. These factors in some manner are believed to be associated with the independent variables. Panel data comprises of both the differentiation of the factors that might help the researcher to control the influence of the absent variables, and intertemporal dynamics (MaCurdy, 1981).

- Revealing dynamic relationships

“Economic behaviour is characteristically dynamic so that most econometrically intriguing relationships are explicitly or implicitly dynamic” (Nerlove, 2002). Be that as it may, the estimation of time adjustment design utilizing time series data frequently needs to depend on subjective earlier limitations. For example, Koyck or Almon distributed lag models since time

series observations of current and lagged variables are probably going to be profoundly collinear (Griliches, 1967).

With panel data, it is important to depend on the between-individual differences to diminish the collinearity amongst current and lag variables to gauge unrestricted time-adjustment pattern (Pakes and Griliches, 1984).

- Producing more accurate forecasts

Producing more exact forecasts for singular results by pooling the data as opposed to producing expectations of individual results utilizing the data on the individual being referred to. On the off chance that individual behaviours are comparably restrictive on specific variables, panel data give the likelihood of taking in an individual's behaviour by watching the behaviour of others. In this way, it is conceivable to acquire a more exact depiction of an individual's behaviour by supplementing observations of an individual being referred to with data on different individuals (Hsiao et al., 1993).

- Gives micro foundations for the overall data analysis

Generally data analysis much of the time relies on the "representative agent" assumption. In any case, if miniaturized units are heterogeneous, not completely can the time series properties of overall data be to a great degree different from those whose data originates from a solitary sample unit (Granger, 1990; Lewbel, 1994; Pesaran, 2003), yet policy evaluation in perspective of the general data may be unpleasantly misleading. In addition, the forecast of overall general outcomes using overall data can be less correct than the expectation in perspective of small equations (Hsiao et al., 2005). Panel data containing time series recordings for different individuals is ideal for investigating the "homogeneity" versus "heterogeneity" issue.

c. Simplified calculations and statistical inference

Panel data include no less than two measurements, a cross-sectional measurement and a time series measurement. Under typical conditions one would expect that the calculation of panel data estimator or inference would be more complex than cross-sectional or time series data. Be that as it may, in specific cases, the accessibility of panel data really simplifies calculation and inference.

- Non-stationary time series analysis

Right when time series data are not stationary, the last sample estimate of the disseminations of the least squares or maximum likelihood estimators are no longer normally distributed, (Anderson, 1959; Dickey and Fuller, 1979, 1981; Phillips and Durlauf, 1986). In any case, in the occasion that panel data is attainable, and recordings among cross-sectional samples are self-sufficient, by then one can invoke as far as possible hypothesis across over cross-sectional units to show that the constraining distributions of various estimators remain asymptotically normal (Folio et al., 2005; Im et al., 2003; Levin et al., 2002; Phillips and Moon, 1999).

- Measurement errors

Estimation errors can provoke under-identification of an econometric model (Aigner et al., 1984). The availability of various observation for a given individual or at a given time may empower a specialist/researcher to roll out different improvements to provoke different and deducible changes in the estimators, hence to recognize a generally unidentified model (Biorn, 1992; Griliches and Hausman, 1986; Wansbeek and Koning, 1989).

4.5.2 Disadvantages of panel data analysis

According Hsiao et al., (1995), the following are the disadvantages for panel data analysis;

- Design and collection challenges for data

Designing and collecting data sometimes become a challenge because of unavailability of data and/or sample units (surveys), hence leading to poor data management.

- Twists of measurement errors

Measurement errors may emerge on account of flawed reactions because of vague inquiries, memory mistakes, deliberate mutilation of reactions, improper sources misreporting of reactions and questioner impacts.

- Short time series dimension

Regular panels include yearly data covering a limited space of time for every individual sample unit. This implies that asymptotic contentions depend importantly on the quantity of individual sample units tending to infinity. Expanding the panel's space of time is not without a dire cost

either. Factually, this builds the odds of steady loss and expands the computational challenges for constrained dependent variable in panel data models.

4.6 ESTIMATION TECHNIQUE AND TOOL

4.6.1 Estimation Technique

4.6.1.1 Auto-Regressive-Distributed-Lags (ARDL)

The autoregressive distributed lags (ARDL) model manages a single cointegrating equation and was developed initially by Peresan and Shin (1999) and additionally amended by Peresan et al. (2001). The reason behind choosing this method is because of the favourable merit that it does not require all variables to be *I(1)* as the Johansen cointegration approach, and it is also appropriate in the event that we have *I(0)* and *I(1)* variables in our set. Another reason is that the model also produces more efficient results even when the sample size is small.

4.6.1.2 The advantages of ARDL estimation technique

- The model produces consistent and robust results for both short and long run relationship between the dependent variable and independent variables.
- The model does not require the variables to be pre-tested meaning that the presence of relationship between variables in level form is acceptable in spite of whether the variables are integrated to the order of 0 or 1, or a mixture of both.
- The model can still be applied even when the sample is small.

4.6.1.3 The disadvantages of ARDL estimating technique

- The parameter estimates are only asymptotically efficient on the assumption of weak exogeneity of the regressors.
- The model assumes only one cointegrating vector hence leading to inefficiency if there exists more than one cointegrating vectors.

4.6.1.4 Panel Auto-Regressive-Distributed-Lags

According to Asghar et al., (2015), the general form for the panel ARDL model can be characterized as follows…

$$Y_{it} = \sum_{j=1}^{P} \beta_{ij} Y_{i,t-j} + \sum_{j=0}^{q} \delta_{ij} X_{i,t-j} + \mu_t + \varepsilon_{it} \quad (4.4)$$

Where number of cross section units i = 1,2…,5 and t = 1980,1981,1982,…,2017, X_{it} is a vector of $k * 1$ regressors, β_{ij} is a scalar, μ_i is a group of specific effect. The error term is an $I(0)$ process (residuals are stationary at level form) if the $I(1)$ variables are cointegrated.

4.6.1.5 Panel ARDL Error Correction Model (ECM)

A major characteristic of cointegrated variables is their response to any deviance from long run equilibrium. This characteristic motivates that error correction dynamics of the variables in the system are influenced by the deviance from equilibrium. The error correction model equation can be expressed mathematically as…

$$\Delta Y_{it} = \beta_i Y_{i,t-1} - \vartheta_i Y_{i,t-j} \sum_{j=1}^{P-1} \gamma_{ij} \Delta Y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij} \Delta X_{i,t-j} + \mu_t + \varepsilon_{it} \quad (4.5)$$

Where β_i is the error correction term (ECT) which indicates the speed of adjustment. If β_i = 0, then there is no cointegration of variables since it is theoretically expected that β_i should be negative and statistically significant for the variables to be cointegrated.

4.6.2 Estimation Tool

4.6.2.1 Stationarity and Stationarity Tests

Stationarity refers to the situation where the three properties (mean, variance and covariance) of the time series do not change over time. One of the reasons why the variables be stationary should be stationary is because the trend of the non-stationary variables could mislead the researcher in terms of forecasting, hence giving false information regarding the trend of the variables. The consequences of running with non-stationary variables among others include unreliable and inconsistent predictions which could mislead policy makers as far as economic policies are concerned.

4.6.2.1.1 Informal Stationarity Test

Visualising the time series against stationarity through three properties of the time series as discussed above helps in determining whether the trend of the time series changes over time or not. If the trend changes over time, then the time series is not stationary hence its three properties change over time.

4.6.2.1.2 Formal Stationarity Tests

This study utilizes LLC and IPS unit root tests to determine the order of integration for the key variables. The reason for this is because of the fact that the key variables for SACU region are more likely to observe the same pattern (cross sectional dependence) which implies that the autoregressive coefficients are more likely to be homogeneous as some of the characteristics for both fiscal and monetary policy across SACU member economies are similar (LLC test). However, due to unpredictable and hostile economic climate as well different approaches and implementations of strategies across SACU member economies for both fiscal and monetary policy, the key variables may differ. That is, a sense of heterogeneity on the autoregressive coefficients across SACU members may be expected (IPS test).

- **Levin, Lin and Chu (LCC) unit root test**

Levin, Lin and Chin (2002) developed different unit root tests for panel data with different model specifications such as intercept and time trend. LCC test imposes homogeneousness on the autoregressive coefficient (trend and intercept may vary across individual time series) which indicates the existence or nonexistence of the unit root.

This test takes on the ADF regression for checking unit root problem. Acknowledging that ARDL and PARDL models require the order of integration to be the maximum of one, the well-known form of LLC test assuming AR(1) process may be expressed mathematically as…

$$\Delta Y_{it} = \beta_i Y_{it-1} + \varphi X_{it} + \mu_{it} \quad (4.6)$$

Where i = 1,2,..,5 cross sections and t = 1980,1981,…,2017. X_{it} represents explanatory variable for cross section i at time period t. β_i is the autoregressive coefficient and it is bound to vary across cross sectional units and μ_{it} denotes the panel error terms which are also supposed to vary across cross section units.

The following null and alternative hypotheses are tested…

$H_0: \beta_i = \beta = 0$

Versus

$H_A: \beta_i = \beta < 0$ for all i

LLC model is based on t-statistic where β is fixed across cross section units under null and alternative hypotheses

$$t_p = \frac{\widehat{\beta}}{se(\widehat{\beta})} \tag{4.7}$$

Accounting for the assumption of independently and normally distributed error term and cross section independence, panel regression test statistic t_β converges to standard normal distribution when N and T approach infinity and the ratio of N to T approaches 0. However, should cross section units be dependent, then the error term will be serially correlated hence giving birth to time trend which would imply that the test statistic will not converge to 0. Under such case, the LCC developed a modified version of test statistic which can be characterized as follows…

$$t_\beta = \frac{t_\beta - N\tilde{T}\hat{S}_N(\sigma_0)^{-2}(\widehat{\beta})\mu_{m*}}{\sigma_{m*}} \tag{4.8}$$

Where $\mu_m *$ and $\sigma_m *$ are modified mean and standard deviation of which values are generated by LCC (1993) from the Monte Carlo simulation.

Using equation 4.6 and ignoring the explanatory variable X_{it}, the unit root models for the key variables in this study can be specified as follows…

$$\Delta RGDP_{it} = \beta_i RGDP_{it-1} + \mu_{it} \tag{4.9}$$

$$\Delta LGEXP_{it} = \beta_i LGEXP_{it-1} + \mu_{it} \tag{4.10}$$

$$\Delta LGREV_{it} = \beta_i LGREV_{it-1} + \mu_{it} \tag{4.11}$$

$$\Delta LPINV_{it} = \beta_i LPINV_{it-1} + \mu_{it} \tag{4.12}$$

$$\Delta LINR_{it} = \beta_i LINR_{it-1} + \mu_{it} \tag{4.13}$$

$$\Delta LINF_{it} = \beta_i LINF_{it-1} + \mu_{it} \tag{4.14}$$

$$\Delta LER_{it} = \beta_i LER_{it-1} + \mu_{it} \tag{4.15}$$

$$\Delta LM2_{it} = \beta_i LM2_{it-1} + \mu_{it} \tag{4.16}$$

Where RGDP denotes real gross domestic product, GEXP government expenditure, GREV government revenue, INV private investment, ER exchange rate, INR interest rate, INF inflation, M2 money supply and L logarithm operator.

Decision Rule

The null hypothesis $H_0: \beta_i = \beta = 0$, means that a unit root exists in RGDP, LGEXP, LGREV, LPINV,LINR, LINF, LER and LM2 money supply. This implies that these variables are non-stationary for all *i* countries. However, when $\beta_i = \beta < 0$, a unit root does not exist hence the variables RGDP, LGEXP, LGREV, LPINV, LINR, LINF, LER and LM2 money supply are stationary for all *i* countries. If the probability value for the LCC test statistic is less than the critical probability (0.01, 0.05 and 0.10), then a unit root does not exist hence the variables are stationary.

- **Im, Peresan and Shin (IPS) Unit root test**

Im, Peresan and Shin (2003) introduced a test to examine unit root in heterogenous panel. ADF test is taken as a base for this test to individual time series. Assuming AR(1) process, overall test can be represented as follows:

$$\Delta Y_{it} = \alpha_{0i} + pY_{it-1} + v_{it} \quad (4.17)$$

IPS test accounts for heterogeneity in v_i values, hence the IPS unit root test equation may be expressed mathematically as…

$$\bar{t}_T = \frac{1}{N}\sum_{i=1}^{N} t_{it}(p_i) \quad (4.18)$$

Where t_{it} is the ADF test statistic, p_i is the lag order. ADF test statistic can be computed as…

$$A_{\bar{t}} = \frac{\sqrt{N(T)}}{\sqrt{Var(t_T)}}[\bar{t}_T - E(t_T)] \quad (4.19)$$

The following null and alternative hypotheses are tested…

$H_0: p_i = p = 0$

Versus

$H_A: p_i = p < 0$ for all *i*

Using equation 4.19, the unit root models for the key variables in this study can be specified as follows…

$$\Delta RGDP_{it} = \alpha_{0i} + pRGDP_{it-1} + v_{it} \quad (4.20)$$

$$\Delta LGEXP_{it} = \alpha_{0i} + pLGEXP_{it-1} + v_{it} \quad (4.21)$$

$$\Delta LGREV_{it} = \alpha_{0i} + pLGREV_{it-1} + v_{it} \quad (4.22)$$

$$\Delta LPINV_{it} = \alpha_{0i} + pLPINV_{it-1} + v_{it} \quad (4.23)$$

$$\Delta LINR_{it} = \alpha_{0i} + pLINR_{it-1} + v_{it} \quad (4.24)$$

$$\Delta LINF_{it} = \alpha_{0i} + pLINF_{it-1} + v_{it} \quad (4.25)$$

$$\Delta LER_{it} = \alpha_{0i} + pLER_{it-1} + v_{it} \quad (4.26)$$

$$\Delta LM2_{it} = \alpha_{0i} + pLM2_{it-1} + v_{it} \quad (4.27)$$

Where RGDP denotes real gross domestic product, GEXP government expenditure, GREV government revenue, INV private investment, ER exchange rate, INR interest rate, INF inflation, M2 money supply and L logarithm operator.

Decision Rule

The null hypothesis $p = p_i = 0$, a unit root exists in RGDP, LGEXP, LGREV,LPINV, LINR, LINF, LER and LM2 money supply meaning that these variables are non-stationary for all *i* countries. However, when $p = p_i < 0$, a unit root does not exist hence the variables RGDP, LGEXP, LGREV, LPINV, LINR, LINF, LER and LM2 money supply are stationary for all *i* countries. If the probability value for the IPS test statistic is less than the critical probability (0.01, 0.05 and 0.10), then a unit root does not exist hence the variables are stationary.

4.7 MODELLING PROCEDURE

In order to build the efficient PARDL model that is fundamental to this study represented by equation 4.5, it is necessary to take the following steps…

4.7.1 Model Specification

Using the PARDL framework, both long and short run models (starting first with long run model) can be specified as follows…

$$RGDP_{it} = \sum_{j=1}^{p} \beta_{ij} RGDP_{i,t-j} + \sum_{j=0}^{q} \theta_{ij} LGEXP_{i,t-j} + \sum_{j=0}^{q} \omega_{ij} LGREV_{i,t-j} +$$
$$\sum_{j=0}^{q} \alpha_{ij} LPINV_{i,t-j} + \sum_{j=0}^{q} \delta_{ij} LINR_{i,t-j} + \sum_{j=0}^{q} \pi_{ij} LINF_{i,t-j} + \sum_{j=0}^{q} \varphi_{ij} LER_{i,t-j} +$$
$$\sum_{j=0}^{q} \sigma_{ij} LM2_{i,t-j} + \mu_t + \varepsilon_{it} \quad (4.28)$$

Where i = 1, 2…,5 and t = 1980, 1982...,2017. ε_{it} is the independent error term that was distributed on i and t. β_{ij}, θ_{ij}, ω_{ij}, α_{ij} δ_{ij}, π_{ij}, φ_{ij} and σ_{ij} represent long run coefficients.

Similarly, the short run model for the fundamental PARDL model of this study can be specified as follows…

$$\Delta RGDP_{it} = \beta_i RGDP_{i,t-1} - \vartheta_i RGDP_{i,t-j} \sum_{j=0}^{p-1} \gamma_{ij} \Delta RGDP_{i,t-j} + \sum_{j=0}^{q-1} \theta_{ij} \Delta LGEXP_{i,t-j} +$$
$$\sum_{j=0}^{q-1} \omega_{ij} LGREV_{i,t-j} + \sum_{j=0}^{q-1} \alpha_{ij} \Delta LPINV_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij} \Delta LINR_{i,t-j} + \sum_{j=0}^{q-1} \pi_{ij} \Delta LINF_{i,t-j} +$$
$$\sum_{j=0}^{q-1} \varphi_{ij} \Delta LER_{i,t-j} + \sum_{j=0}^{q-1} \sigma_{ij} \Delta LM2_{i,t-j} + \mu_t + \varepsilon_{it} \quad (4.28)\ *$$

Where β_i is the error correction term (ECT) which indicates the speed of adjustment. If β_i = 0, then there is no cointegration of variables since it is theoretically expected that β_i should be negative and statistically significant for the variables to be cointegrated. γ_{ij}, θ_{ij}, ω_{ij}, α_{ij}, δ_{ij}, π_{ij}, φ_{ij} and σ_{ij} represent short run coefficients. ε_{it} is the independent error term that is distributed on i and t.

4.7.2 Descriptive Statistics

Descriptive statistics are computed because they provide a preview on the nature of the data, in addition they provide simple summaries about the sample and the measures (William, 2006).

4.7.3 Correlation Analysis

One of the assumptions for an efficient estimated ARDL model is that the independent variables should not be highly collinear with each other. Otherwise, the model might suffer from the problem of multicollinearity. Thus, the correlation among the independent variables should be at most ±0.80 (Peresan et al., 1999).

4.7.4 Unit Root Tests

Using LLC and IPS unit root tests discussed under "estimation tools", the order of integration for the key variables will be determined. As per ARDL/PARDL framework, all key variables should be either *I(0)* or *I(1)*. *I(2)* variables are not allowed in the system (Peresan et al., 1999).

4.7.5 Optimal Lag Selection

Selecting the optimal lag length using Vector Auto Regression (VAR) approach is very important as far as ARDL/PARDL model estimation is concerned. The likelihood ratio test and information criteria such as Akaike Information Criterion (AIC), Schwarz Bayesian Information Criterion (SBIC) and Hannah Quinn Information Criterion (HQIC) are used to identify the most optimal lag for the independent variable and the independent variables. All information criteria should be small as far as possible (Brooks, 2008).

The likelihood ratio test for the optimal lag length selection

The likelihood ratio (LR) test which is a statistical test utilized for contrasting the goodness of fit of two models, one of which is a special case of the other, is naturally and genuinely simple to perform, but however has its restrictions. Essentially, one of the two VARs must be a special case of the other and, all the more, only pairwise comparisons can be made. The likelihood ratio test statistic is characterized as …

$$\mathrm{LR} = \mathrm{T}\left[\log\left|\widehat{\Sigma \mathrm{r}}\right| - \log\left|\widehat{\Sigma \mu}\right|\right] \tag{4.29}$$

Where $\left|\widehat{\Sigma r}\right|$ is the determinant of the variance covariance matrix of the residuals for the restricted model (with 4 lags), $\left|\widehat{\Sigma \mu}\right|$ is the determinant of the variance covariance matrix of the residuals for the unrestricted VAR (with 8 lags) and T is the sample size.

A disadvantage of the LR test approach is that the χ^2 test will entirely be substantial asymptotically only under the presumption that the errors from every equation are normally distributed. This assumption is probably not going to be maintained for financial data.

The Information criteria for the optimal lag length selection

An optional approach for choosing the suitable optimal lag length is to utilize an information criterion. Information criteria require no such normality assumptions concerning the distribution of the error terms. Instead, the criteria trade off a fall in the residuals sum of squares (RSS) of every equation as more lags are included, with an increment in the value of the penalty term. The univariate criteria could be utilized independently to every equation except, once more; it is typically considered desirable to require the number of lags to be the same for every equation. This requires the utilization of multivariate versions of the information criteria namely: Akaike Information Criterion (AIC), Schwarz Bayesian Information Criterion (SBIC) and Hannah Quinn Information Criterion (HQIC), which can be characterized as…

$$\text{AIC} = \log\left|\hat{\Sigma}\right| + 2\frac{k'}{T} \tag{4.30}$$

$$\text{SBIC} = \log\left|\hat{\Sigma}\right| + \frac{k'}{T}\log(T) \tag{4.31}$$

$$\text{HQIC} = \log\left|\hat{\Sigma}\right| + \frac{k'}{T}\log(\log(T)) \tag{4.32}$$

Where $\hat{\Sigma}$ the variance- covariance matrix of the residuals, T is the sample size and k' represents the total number of regressors in all equations which will be equal to $P^2k + P$ for P equations in VAR system, each with k lags of the P variables, plus a constant in each equation (Brooks, 2008).

In this study, only information criteria (AIC, SBIC and HQIC) will be used to determine the optimal lag for both the dependent and independent variable(s) using the automatic model selection using Eviews 9 software. The reason for this is because the automatic model selection derives the most efficient model as far as minimizing the residuals error is concerned.

4.7.6 Cointegration Test

Understanding the concept of Cointegration

Supposing a bivariate regression model constitutes a dependent variable Y and an independent variable X. Assuming that both variables are stationary at first difference (*I(1)*), then X and Y can be said to be cointegrated. This can normally be sustained when β_1 parameter takes on the linear combination (raised to the power of one) in the following equation:

$$Y_t = \hat{\beta}_0 + \hat{\beta}_1 X_t + \hat{\mu}_t \quad (4.33)$$

Where $\hat{\beta}_0$ and $\hat{\beta}_1$ are the estimated coefficients and $\hat{\mu}$ is the estimated error term at time period t. $\hat{\mu}_t$ is estimated by the following equation using Ordinary Least Squares (OLS) method…

$$\hat{\mu}_t = Y_t - \left[\hat{\beta}_0 + \hat{\beta}_1 X_t\right] \quad (4.34)$$

In order for the variables X and Y to be cointegrated, the estimated error terms at time period t ($\hat{\mu}_t$) are assumed to be stationary at level. Hence, $\hat{\mu}_t \sim I(0)$ process.

Granger (1981) introduced this statistical technique in economics to establish the long run relationship between economic variables. In short, this notion in economics implies that these variables (X and Y) are moving along with each other over time so that in the event of any deviation, the equilibrium relationship will be driven back to normal due to economic shocks coming into being. Since this study relies on panel data, the following panel data cointegration test will be used;

- **Kao panel cointegration test**

Kao (1999) developed a test of cointegration based on the Engle Granger (1987) cointegration method. However, the test is developed in the context of panel data with the aid of the Augmented Dickey-Fuller type tests. Assuming the following equation:

$$Y_{it} = \beta_{0_i} + \phi X_{it} + \mu_{it} \quad (4.35)$$

Where ϕ slope parameter is taken to be the same (homogenous) for all sample units in the panel. This simply indicates that there is a common cointegrating equation. The Kao (1999) test includes application of Dickey-Fuller and the Augmented Dickey-Fuller tests on the residuals estimated through panel OLS estimation notion represented by equation 4.40. The following equations act as the estimates for Kao (1999) cointegration test:

$$\hat{e}_{it} = \varphi \hat{e}_{it-1} + \pi_{it} \quad (4.36)$$

$$\hat{e}_{it} = \varphi \hat{e}_{it-1} + \pi_{it} \sum \varphi_j \, \Delta \varphi \hat{e}_{it-j} + \pi_{it} \quad (4.37)$$

Where $\hat{e}_{it}$ represents the residuals estimated from equation 4.40. Dickey-Fuller and the Augmented Dickey-Fuller tests are indicated by equations 4.41 and 4.42 respectively. Hence, the following null and alternative hypotheses are tested:

$H_0 : \varphi = 1$ (no cointegration)

$H_A : \varphi < 1$ (cointegration)

If the probability value of the calculated statistic is less than the critical probability value at any level of significance (0.01, 0.05 and 0.10), then the null hypothesis (H_0) should be rejected hence there would be an evidence of cointegration between or among the variables.

4.7.7 PARDL Model Estimation

After detecting the presence of cointegration using Pedroni (1999) and Kao (1999) cointegration tests, both short and long run relationships will be estimated using PARDL approach. Peresan et al. (1999) presented the main three estimators that can be used to estimate efficient PARDL models. In short, these estimators are mean group (MG), pooled mean group (PMG) and dynamic fixed effects (DFE) estimator. However, in this study the focus is on the pooled mean group (PMG) estimator.

- **The pooled mean group (PMG) estimator**

The primary essentials for PMG estimator is that it is valuable and valid when the variables are greater than the cross sections. It also permits short-run coefficients, including the intercepts, the speed of adjustment in accordance with the long-run equilibrium values, and the variances of the error to be heterogeneous nation by nation, while at the same time the long-run slope coefficients are confined to be homogeneous crosswise over nations. This is especially valuable when there are reasons to expect that the long-run equilibrium relationship between the variables is the same across the nations. The short run adjustment is permitted to be nation particular, because of the broadly extraordinary effect of the economic and/or financial crises and external shocks, policies useful for stabilization, monetary policy and so on. In any case, there are a few prerequisites for the legitimacy, consistency and effectiveness of this method. To start with, the presence of a long-run relationship among the variables under study requires the coefficient on the error correcting term to be negative with t statistic not lower than - 2.

Secondly, a critical assumption for the consistency of the ARDL model is that the subsequent residual of the error correction model must be serially uncorrelated, and the explanatory variables can be dealt with as exogenous. Such conditions can be satisfied by including the ARDL (p,q) lags

for the dependent (p) and independent variables (q) in error correction form. Thirdly, the relative size of T and N is vital, since when the two are large, this enables the utilization of the dynamic panel method, which lowers the chances of biased average estimators and resolves the issue of heterogeneity. Eberhardt and Teal (2010) contend that the treatment of heterogeneity is integral to understanding the development process. Along these lines, neglecting to satisfy these conditions will produce inconsistent estimation in PMG.

Considering the following unrestricted specification for the ARDL system for t = 1,2, 3..., T time period and i = 1,2,3,…,N nations for the dependent variable Y;

$$Y_{it} = \sum_{j=1}^{p} \delta_{ij} Y_{i,t-j} + \sum_{j=1}^{q} \beta_{ij} X_{it-j} + \mu_i + \varepsilon_{it} \quad (4.38)$$

Where X_{it-j} is the (K*1) vector of explanatory variables for the group i and μ_i represents fixed effects. The model can also be characterized as a VECM framework as shown in the following equation…

$$\Delta Y_{it} = \alpha_i \left(Y_{i,t-1} - \acute{o}_1 X_{i,t-1}\right) + \sum_{j=1}^{p-1} \delta_{ij} \Delta Y_{i,t-j} + \sum_{j=1}^{q-1} \acute{\beta}_{ij} \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (4.39)$$

Where σ_i are the long run parameters and α_i are the equilibrium (error) correction parameters. The PMG limitation is that the elements of σ are common across nations. Hence,

$$\Delta Y_{it} = \alpha_i \left(Y_{i,t-1} - \sigma X_{i,t-1}\right) + \sum_{j=1}^{p-1} \delta_{ij} \Delta Y_{i,t-j} + \sum_{j=1}^{q-1} \acute{\beta}_{ij} \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (4.39)\ *$$

All the dynamics and the ECM terms are allowed to vary in PMG. Under some regular assumptions, the parameter estimates of the PMG model are consistent and asymptotically normal for both stationary and non-stationary regressors.

4.7.8 Hausman (1978) Test

Within the panel ARDL framework, the Hausman test is used to decide whether the means group (MG) or pooled means group (PMG) estimation method should be used to make an inference on both short and long run settings for the panel data analysis under study (Peresan et al., 1999). However, in this study Hausman (1978) test will be conducted. That is, the statistical results will be estimated directly using pooled mean group (PMG) estimator. This can only be acceptable and valid if there are reasons and/or motivations to expect that the long-run equilibrium association between the variables is the same across the nations (Peresan et al., 1999). Peresan et al. (1999)

also indicated that the PARDL model can be estimated directly using PMG estimator if the variables under study are greater than the cross sections or sample units.

4.7.9 Causality Test

Engel and Granger (1987) discussed that if cointegration exists between two variables in the long-run model, there must either bi-directional or unidirectional causality between them. The Granger causality test for two stationary variables can be performed to test for the following hypotheses:

H_0= x_t does not cause y_t

H_1 = x_t does cause y_t

To determine which hypothesis holds, the Granger Causality test was conducted using the following equations:

$$y_t = a_1 + \sum_{i=1}^{n} \beta i \, x_{t-i} + \sum_{j-1}^{m} \quad \gamma_j y_{t-j} + e_{1t} \tag{4.40}$$

$$x_t = a_2 + \sum_{i=1}^{n} \theta i \, x_{t-i} + \sum_{j-1}^{m} \delta \mathrm{j} y_{t-1} + e_{2t} \tag{4.41}$$

4.7.10 Residuals Diagnostic Tests

Lastly to check the reliability of the estimated panel ARDL model, two main residuals diagnostic tests applicable to panel ARDL framework will be utilized. These tests are fully explained as follows:

a. Normality Assumption and Test

Normality is an assumption that is originally ascribed to basic ordinary least squares (OLS) regression model. In short, the residuals resulting from the estimated model(s) are assumed to be normally distributed. That is, the shape of the resulting residuals should be that of the bell curve (Wagner, 2007). Failure to satisfy this assumption would make the results biased hence estimated model coefficients would be unreliable (Wooldridge, 2009).

There are various tests for normality such as histogram of residuals normal probability curve, Anderson Darling and Jarque Bera tests. The Jarque Bera test for normality is utilized in this study. The Jarque Bera test is mainly utilized in large sample cases. The Jarque Bera test statistic for normality is characterized as…

$$\mathrm{JB} = \frac{\mathrm{N}-\mathrm{K}+1}{6}\left(\mathrm{S}^2 \frac{1}{4}(\mathrm{C}-3)^2\right) \quad (4.42)$$

Where N denotes number of observations, K denotes number of predictor variables, S represents the skewedness of the sample's distribution and C denotes the kurtosis of the sample's distribution. The following hypothesis is tested…

H_0: The residuals are normally distributed.

b. Cross Section Independence and Tests

Cross sectional independence refers to the situation where the residuals from the estimated panel model on each cross section do not depend on each other (Peresan, 2004). In other words, the cross sectional residuals are not correlated. Suppose the estimated panel model exhibits cross sectional dependence, Phillips and Sul (2003) emphasize that the model would be inefficient in such a way that the pooled least squares estimator may give little advantage over the single equation ordinary least squares. This implies that if the panel model is estimated using a pooled population of cross sections with homogeneous slope parameters, the efficiency that would have been realized in the model compared to the individual ordinary least squares (OLS) regressions for each cross section, may decrease significantly (De Hoyos and Sarafidis, 2006).

There are four kinds of cross independence tests that can be utilized to test the correlation of the residuals for the given cross sectional sample units. The following are the tests that are commonly used to test cross sectional correlation of the residuals:

- Breusch and Pagan (BP) Langrage Multiplier (LM) Dependence Test

Breusch and Pagan (1980) proposed the Langrage Multiplier (LM) test which can be used to test for the residuals correlation for cross section *i* at time period *t* in heterogeneous panel models. Hence the following equation represents BP_{LM} test statistic:

$$BP_{LM} = T \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}^2{}_{ij} \quad (4.43)$$

Where $\hat{\rho}$ is the sample estimate of the pair wise correlation of the residuals.

$$\text{Hence, } \hat{\rho}_{ij} = \hat{\rho}_{ji} = \frac{\sum_{t=1}^{T} \hat{v}_{it}\hat{v}_{jt}}{(\sum_{t=1}^{T} V^2{}_{it})^{\frac{1}{2}}(\sum_{t}^{T} V^2{}_{jt})^{\frac{1}{2}}} \quad (4.44)$$

Where V^2 is the estimate of the v_{it} (error term for cross section *i* at time period *t*.

The BP_{LM} test is assumed to be asymptotically normally distributed with the mean of zero and variance of one under the null hypothesis with time period (T) and cross sections (N) approaching infinity.

- Peresan Cross Section Dependence (CD) Test

Peresan (2004) proposed a cross section dependence (CD) test which is commonly used to test whether the residuals for cross section *i* at time period *t* are correlated or not. The CD test is based on the Langrage Multiplier (LM) test which was developed by Breusch and Pagan (1980). The CD test is an alternative to the BP test with zero mean for values of N and T within the bigger range of data in panel models that could either be homogeneous or heterogeneous dynamic models. Hence, the following equation presents the Peresan cross section dependence test:

$$CD_{LM} = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\right) \tag{4.45}$$

Furthermore, under the null hypothesis of no cross section independence, the CD_{LM} test is normally distributed with zero mean and variance of one where N and T approach infinity.

- Peresan Scaled (PS) LM Dependence Test

Peresan, Ullah and Yamagata (2008) developed the new LM test by rescaling and re-centring the CD LM test. The test is denoted as PUY's LM test, sometimes referred to as the Peresan scaled LM test (Baltagi et al., 2016). Hence, the following equation presents PS/PUY LM test statistic:

$$PUY_{LM} = \sqrt{\frac{2}{N(N-1)}}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\frac{(T-K)\hat{\rho}^2{}_{ij}-\mu T_{ij}}{\sigma T_{ij}} \tag{4.46}$$

Where $\mu T_{ij} = \frac{1}{T-K}t_r\left(E\left(M_iM_j\right)\right) = E\left((T-K)\hat{\rho}^2{}_{ij}\right)$ (4.47)

And $\sigma T^2{}_{ij} = tr\left(E\left(M_iM_j\right)\right)^2 a_{1T} + 2tr\left(\left(M_iM_j\right)^2\right)a_{2T}$ (4.48)

Where $a_{1T} = a_{2T} - \frac{1}{(T-K)^2}$, $a_{2T} = 3\left(\frac{(T-K-8)(T-K+2)+24}{(T-K+2)(T-K-2)(T-K-4)}\right)^2$, $M_i = I - X_i(X'_iX_i)^{-1}X'_i$

$X_i = X_{i1}, \ldots, X_{iT}$ with T observations on K regressors for the i^{th} individual regression.

Just like BP_{LM} and CD_{LM} tests, PUY_{LM} test is also assumed to be normally distributed with zero mean and variance of one, under the null hypothesis where T and N approach infinity.

- Bias Corrected Scaled (BC) LM Dependence Test

Peresan (2004) developed a bias corrected scaled LM test which catered for panel data models when the ratio of cross sections (N) to time periods (T) approaching a constant c which is an element of any real number between zero and infinity $\left(\frac{N}{T} \to c \in (0, \infty)\right)$. This test is also applicable when the joint asymptotic of N cross sections and T time periods approach infinity, $(N, T) \to \infty$. Hence, the following equation represents the BC_{LM} test statistic:

$$BC_{LM} = New\ LM - \frac{N}{2(T-1)} = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \left(\hat{\rho}^2{}_{ij} - 1\right) - \frac{N}{2(T-1)} \quad (4.49)$$

The BC_{LM} test is also assumed to be normally distributed with N as comparably large as T (Baltagi et al., 2016).

For all the tests, the following null hypothesis is tested:

H_0: There is no cross sectional dependence (No serial correlation)

4.8 CONCLUSION

This chapter has fully discussed the variables to be used in this study, the model framework and relevant estimation technique as well as tools to be used in this study. The Panel Auto Regressive Distributed Lags (PARDL) estimation technique as well its modelling procedure have been fully discussed. This chapter has also discussed the residuals diagnostic tests to be used to diagnose the estimated models and the resulting residuals so that impacts of both fiscal and monetary policy on economic growth in SACU economies may be correctly analyzed. EViews 9 software will be used to run the specified models.

CHAPTER FIVE

ESTIMATION, PRESENTATATION AND INTERPRETATION OF FINDINGS

5.1 INTRODUCTION

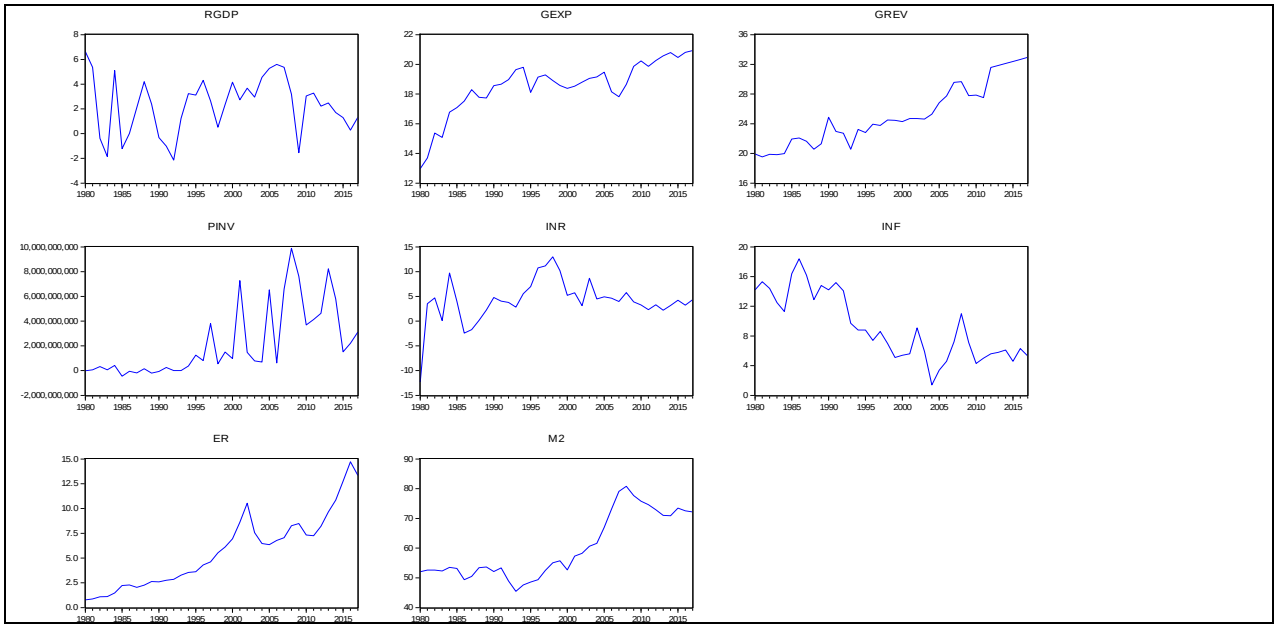
This chapter presents the estimations, test procedures and interpretations of the methodology discussed in the previous chapter. Firstly, the graphical presentations for the variables will be visually inspected for stationarity (informal unit root test). Secondly, formal unit root tests will be conducted using LLC and IPS tests to determine the order of integration for the variables. Thirdly, the PARDL model specified in the previous chapter will be interpreted and discussed. Lastly, a cognitive conclusion based on findings will conclude the chapter.

5.2 INFORMAL UNIT ROOT TEST

This section briefly discusses the nature of data for stationarity condition through analysing the plots for both fiscal and monetary policy variables for SACU region between 1980 and 2017.

5.2.1 Informal unit root test for South Africa

Figure 5.1 Graphical presentations of fiscal and monetary policy variables and GDP between 1980 and 2017 in South Africa

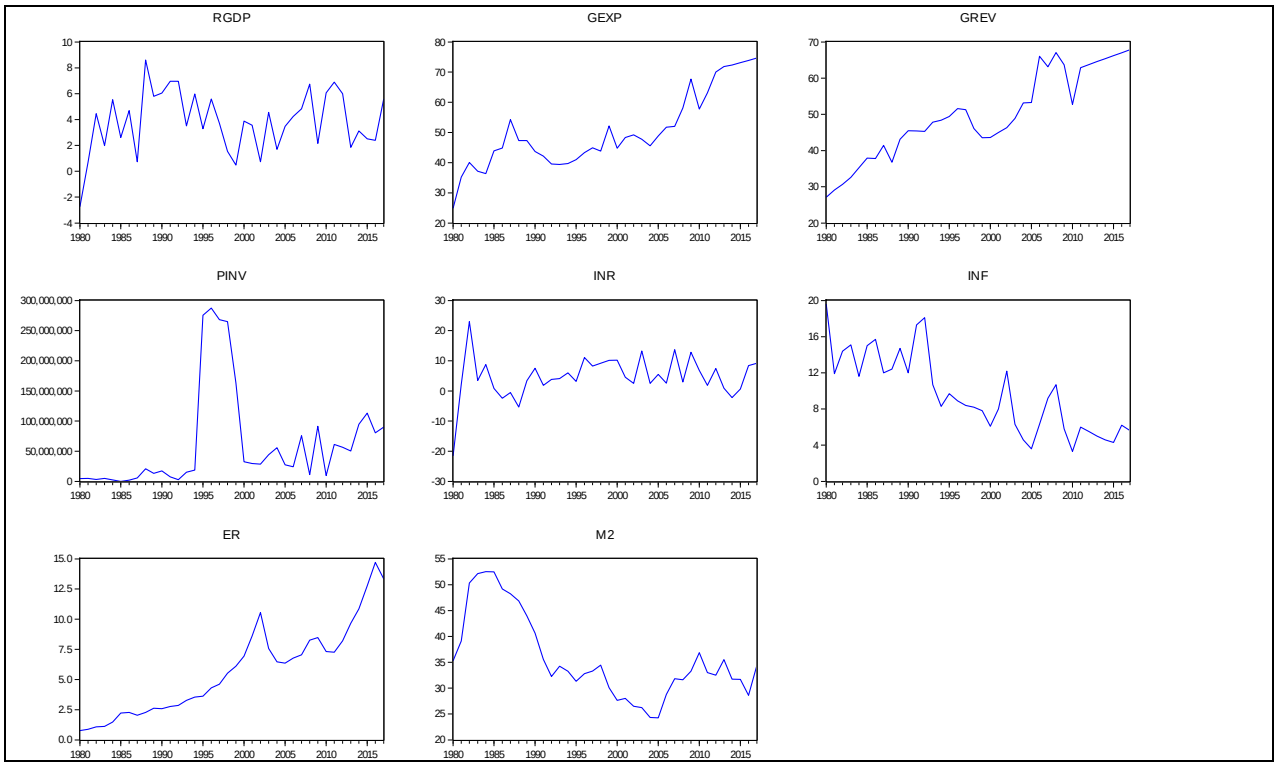


Source: Author's own computations using World Bank and IMF data through Eviews 9 software.

Variables such as RGDP, LPINV and LINR seem to be having constant mean and variance since their trends do not change for the period of 1980 to 2017. Hence, it can be concluded that these variables do not need to be integrated. However the time series of the variables like LGEXP, LGREV, LINF, LER and LM2 change over time for the period of 1980 and 2017. This simply implies that these variables are not stationary. Hence, integration is necessary for these variables.

5.2.2 Informal unit root test for Lesotho

Figure 5.2: Graphical presentations of fiscal and monetary policy variables and RGDP between 1980 and 2017 in Lesotho

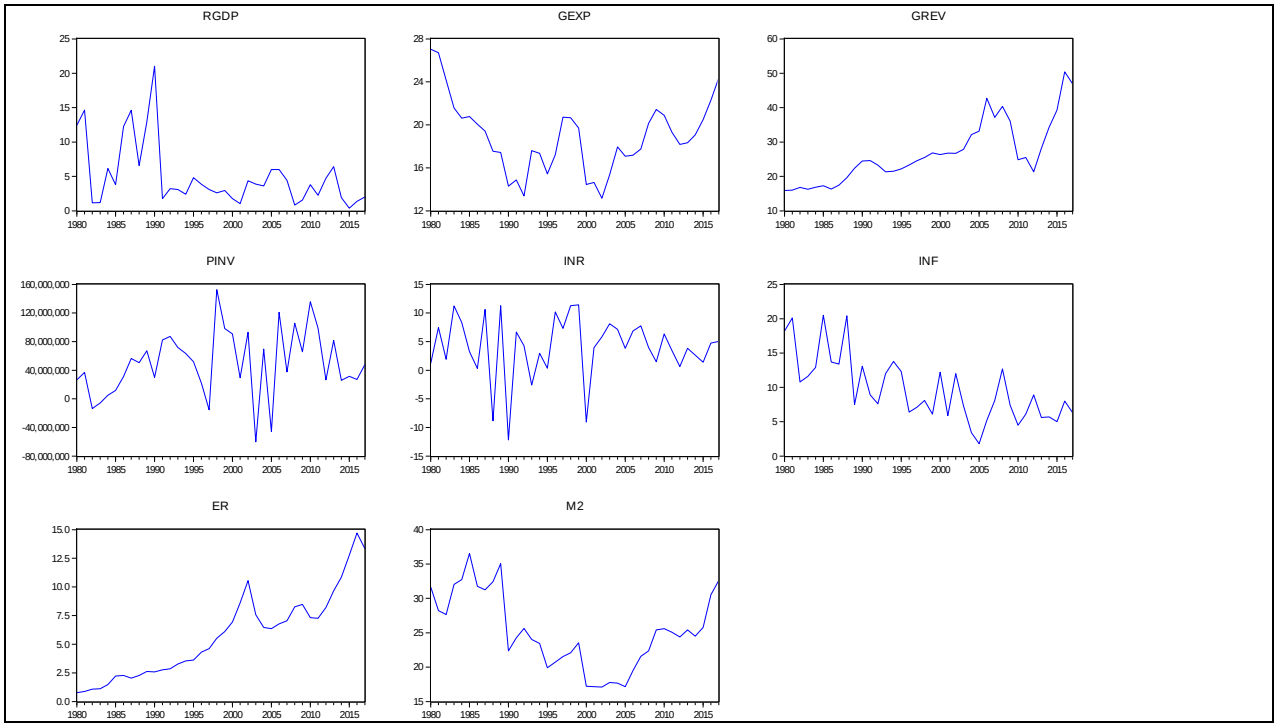


Source: Author's own computations using World Bank and IMF data through Eviews 9 software.

Variables such as RGDP, LPINV, LINR and LINF seem to be having constant mean and variance since their trends do not change for the period of 1980 to 2017. Hence, it can be concluded that these variables do not need to be integrated. However the time series of the variables like LGEXP, LGREV, LER and LM2 change over time for the period of 1980 and 2017. This simply implies that these variables are not stationary. Hence, integration is necessary for these variables.

5.2.3 Informal unit root test for Swaziland

Figure 5.3: Graphical presentations of fiscal and monetary policy variables and RGDP between 1980 and 2017 in Swaziland

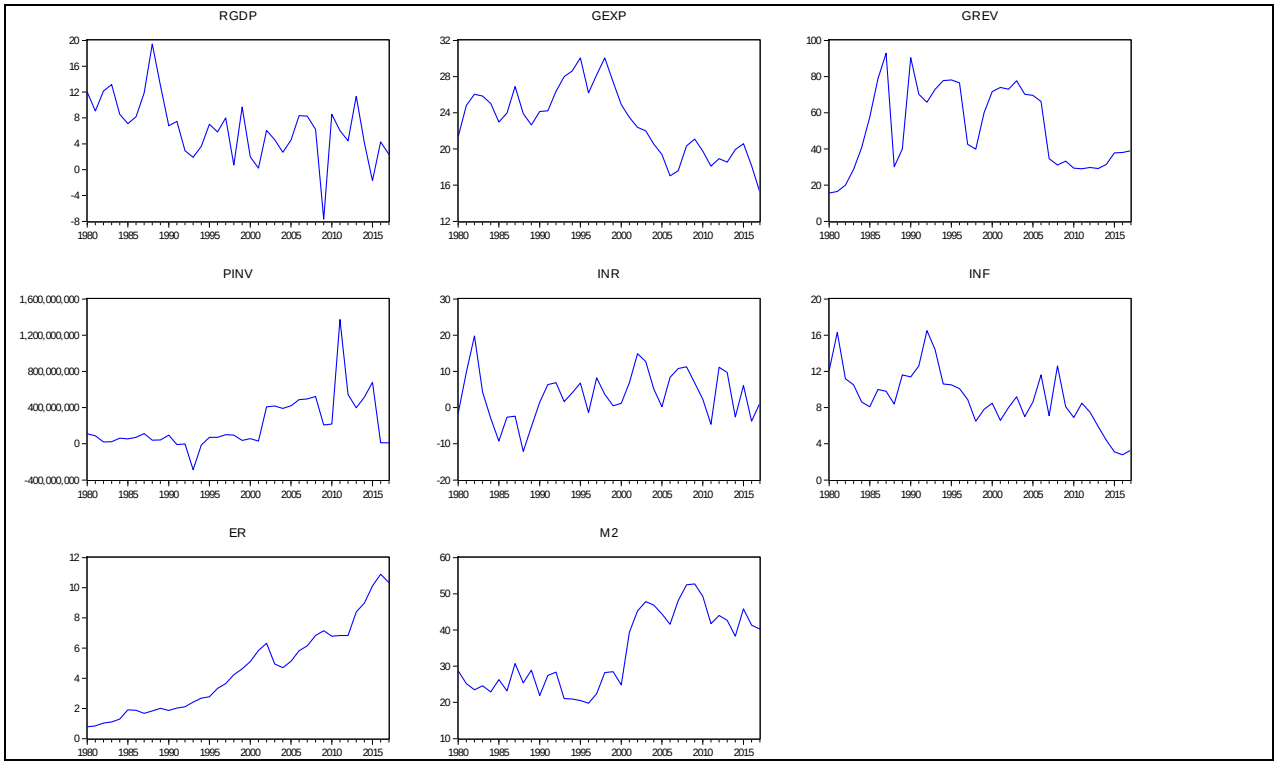


Source: Author's own computations using World Bank and IMF data through Eviews 9 software.

Variables such as RGDP, LPINV, LINR, LINF and LGEXP seem to be having constant mean and variance since their trends do not change for the period of 1980 to 2017. Hence, it can be concluded that these variables do not need to be integrated. However the time series of the variables like LGREV, LER and LM2 change over time for the period of 1980 and 2017. This simply implies that these variables are not stationary. Hence, integration is necessary for these variables.

5.2.4 Informal unit root test for Botswana

Figure 5.4: Graphical presentations of fiscal and monetary policy variables and RGDP between 1980 and 2017 in Botswana

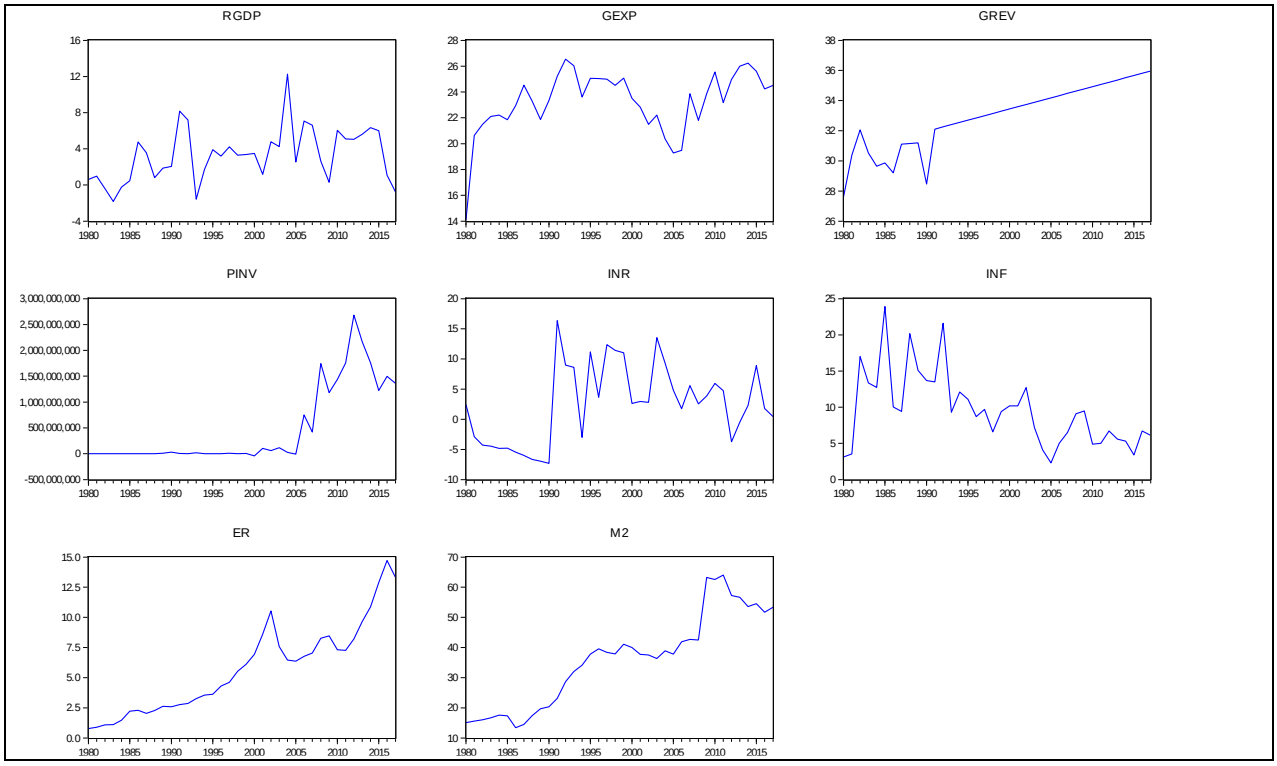


Source: Author's own computations using World Bank and IMF data through Eviews 9 software

Variables such as RGDP, LPINV, LINR, LINF, LGREV, LGEXP and LM2 seem to be having constant mean and variance since their trends do not change for the period of 1980 to 2017. Hence, it can be concluded that these variables do not need to be integrated. However the time series of the LER variable does change over time for the period of 1980 and 2017. This simply implies that this variable is not stationary. Hence, integration is necessary for this variable.

5.2.5 Informal unit root test for Namibia

Figure 5.5: Graphical presentations of fiscal and monetary policy variables and RGDP between 1980 and 2017 in Namibia



Source: Author's own computations using World Bank and IMF data through Eviews 9 software

Variables such as RGDP, LPINV, LGEXP, LINR and LINF seem to be having constant mean and variance since their trends do not change for the period of 1980 to 2017. Hence, it can be concluded that these variables do not need to be integrated. However the time series of the variables like LGREV, LER and LM2 change over time for the period of 1980 and 2017. This simply implies that these variables are not stationary. Hence, integration is necessary for these variables.

In examining the nature of the data through the graphs plotted above, it can be seen that fiscal and monetary policy variables observe relatively but not exactly the same graphical presentations across Southern African Custom Union (SACU) member economies between 1980 and 2017. In other words, fiscal and monetary policy variables graphical presentations (quantitatively) confirm qualitative evidence gathered in chapter two which indicated a sense of homogeneity in fiscal and monetary policy across SACU economies between 1980 and 2017.

5.3 Panel Auto-Regressive Distributed Lags (PARDL) model building

As indicated by Peresan et al. (1999), before estimating the ARDL/PARDL the descriptive statistics and correlation analysis for the key variables need to be taken into consideration. Descriptive statistics are used as the tool to analyze the nature and distribution of data; on the other hand, correlation analysis is used to detect whether the independent variables are highly collinear with each other or not. Hence, Peresan et al. (1999) indicated that the correlation among the independent variables should be at most ±0.80, otherwise the estimated ARDL/PARDL model could suffer from the problem of multicollinearity.

5.3.1 Descriptive statistics

Descriptive statistics are computed because they provide a preview on the nature of the data, and, in addition they provide simple summaries about the sample and the measures (William, 2011). Hence, Table 5.1 presents descriptive statistics for all the key variables (see appendix 2).

Table 5.1 Descriptive Statistics for the key variables

	RGDP	LGEXP	LGREV	LPINV	LINR	LINF	LER	LM2
Mean	4.1830	3.2406	3.5604	14.5783	1.1062	2.2567	1.7039	3.5868
Median	3.6259	3.1295	3.5157	17.9372	1.5888	2.2669	1.8098	3.5676
Maximum	21.0180	4.3260	4.5424	23.0143	3.1767	3.2161	2.7543	4.4043
Minimum	-7.6523	2.6368	2.8112	-19.930	-3.115	0.8755	0.5751	2.6649
Std. Dev.	3.8397	0.3836	0.3963	10.8440	1.4827	0.4344	0.5945	0.4052
Skewness	1.1248	1.1780	0.4379	-2.4134	-1.174	-0.3067	-0.2304	-0.0464
Kurtosis	6.0323	3.7076	2.6129	7.3239	3.2212	2.9028	1.9890	2.2024
Jarque B.	112.8561	48.0481	7.2587	332.4512	44.049	3.0538	9.7723	5.1044
P(JB)	0.0000	0.0000	0.0265	0.0000	0.0000	0.2172	0.0075	0.0779
Sum	794.7693	615.7197	676.4814	2769.882	210.187	428.781	323.7409	681.4973
Observations	190	190	190	190	190	190	190	190

Source: Author's own computations using Eviews 9 Software

Wegner (2007) indicates that the sign of the skewness coefficient represents the direction of skewness. If the value of the skewness coefficient is negative the distribution is marginally skewed

to the right, otherwise when the skewness coefficient is positive, it is skewed to the left. The sign of skewness coefficients of the variables like RGDP, LGEXP and LGREV are positive which implies that the distribution of these variables are skewed to the left. The remaining variables have negative skewness coefficients which implies that the distribution of these variables (LPINV, LINR, LINF, LER and LM2) is skewed to the right.

In checking the normality assumption for the key variables, it can be seen that only LM2 and LER are normally distributed, whereas the remaining variables are not normally distributed. However, this does not poses any threat to building a suitable model for this study since the assumption of normality is for the most part essential for the resulting residuals from the model to be estimated. Hence, satisfaction of the assumption of normality will only be prioritized on the residuals to be estimated from the fundamental model of this study.

Over the period of 1980 to 2017, the SACU region recorded the average of 4.18, 3.24, 3.56, 14.58, 1.11, 2.26, 1.70 and 3.59 for the real gross domestic product, logged government expenditure and revenue, private investment, interest rate, inflation, exchange rate and M2 money supply respectively. The maximum reading for the real gross domestic product, logged government expenditure and revenue, private investment, interest rate, inflation, exchange rate and M2 money supply are 21.02, 4.33, 4.54, 23.01, 3.18, 3.22, 2.75 and 4.40 respectively. Lastly, the region recorded the minimum value of -7.65, 2.64, 2.81, -19.93, -3.12, 0.88, 0.58 and 2.66 for the real gross domestic product, logged government expenditure and revenue, private investment, interest rate, inflation, exchange rate and M2 money supply respectively.

5.3.2 Correlation analysis

According to Wegner (2007) correlation refers to a linear dependency relationship between two or more variables. Hence, the correlation coefficient is a number between -1 and 1 that is calculated to determine the linear dependency relationship of two or more variables in the data set. A correlation coefficient of 1 implies that the variables have a perfect positive linear relationship, whereas a coefficient of -1 implies a perfect negative linear relationship. Any value for correlation that is close to zero would simply indicate little evidence of a linear relationship between two or more variables. In addition, a correlation coefficient between 0.30 and 0.50 implies that the linear association between variables is moderate, 0.60 to 0.70 indicates an adequate linear association

and 0.80 to 0.99 implies a large positive linear association. In a case where the correlation coefficient is negative, it is interpreted in the same manner but it needs to be taken into an account that the direction of the association would be opposite (Gujarati, 2009).

One of the assumptions for an efficient estimated ARDL model is that the independent variables should not be highly collinear with each other, otherwise, the model might suffer from the problem of multicollinearity. Thus, the correlation among the independent variables should be at most 0.80 (Peresan et al., 1999). Table 5.2 presents the correlation matrix for the key variables (see Appendix 3).

Table 5.2 Correlation Matrix for the key variables

	RGDP	**LGEXP**	**LGREV**	**LPINV**	**LINR**	**LINF**	**LER**	**LM2**
RGDP	1	0.0240	-0.0027	0.1084	-0.0576	0.0686	-0.2100	-0.1287
LGEXP	0.0240	1	0.5886	0.0840	0.0968	-0.0259	0.1101	-0.0603
LGREV	-0.0027	0.5886	1	0.0706	0.0426	-0.2109	0.3022	-0.1446
LPINV	0.1084	0.0840	0.0706	1	0.0472	-0.2413	0.2966	0.1628
LINR	-0.0576	0.0968	0.0426	0.0472	1	-0.2521	0.3027	0.2469
LINF	0.0686	-0.0259	-0.2109	-0.2413	-0.2521	1	-0.6344	0.1433
LER	-0.2100	0.1101	0.3022	0.2966	0.3027	-0.6344	1	0.2664
LM2	-0.1287	-0.0603	-0.1446	0.1628	0.2469	-0.1433	0.2664	1

Source: Author's own computations using Eviews 9 Software

As shown in the above table, the correlations for the predictor variables against each other is less than ±0.80 percent which simply implies that the model to be estimated will definitely not experience a problem of multicollinearity.

5.3.3 Panel unit roots tests

Levin, Lin and Chu (LLC) and Im, Peresan and Shin (IPS) tests are utilized for stationarity or unit root testing. Gujarati (2009) states that if a model is estimated with non-stationary data, results will be spurious. Stationarity testing acts as the step to determine the order of integration of all key variables. Hence, Table 5.3 and Table 5.4 represent the results for the unit root tests on all key variables of this study;

Table 5.3 Panel unit root tests results for all key variables at level

Level						
		With Intercept		With Trend and Intercept		
Variable	**Test**	**Statistic**	**P-Value**	**Statistic**	**P-Value**	**Order of Integration**
RGDP	LLC	-7.62828	0.0000*	-7.64162	0.0000*	*I*(0)
	IPS	-7.64490	0.0000*	-7.43331	0.0000*	*I*(0)
LGREV	LLC	-3.74501	0.0001*	-2.64512	0.0041*	*I*(0)
	IPS	-3.73235	0.0001*	-2.58490	0.0049*	*I*(0)
LGEXP	LLC	0.0527	0.5216	-2.23183	0.0128*	*I*(0)
	IPS	0.76847	0.7789	-4.09692	0.0000*	*I*(0)
LPINV	LLC	-4.27798	0.0000*	-3.59154	0.0002*	*I*(0)
	IPS	-6.03234	0.0000*	-5.17979	0.0000*	*I*(0)
LINR	LLC	-7.75425	0.0000*	-6.80416	0.0000*	*I*(0)
	IPS	-9.27689	0.0000*	-8.37609	0.0000*	*I*(0)
LINF	LLC	-3.27190	0.0005*	-5.68043	0.0000*	*I*(0)
	IPS	-2.5211	0.0058*	-5.46229	0.0000*	*I*(0)
LM2	LLC	-0.37868	0.3525	0.61780	0.7310	*I*(0)
	IPS	0.66695	0.7476	1.05656	0.8546	*I*(0)
LER	LLC	-1.74122	0.0408**	-2.29519	0.0109**	*I*(0)
	IPS	0.93715	0.8257	-2.11595	0.0172**	*I*(0)

NB: */**/*** denotes significance at 1%, 5% and 10% respectively
Source: Author's own computations using Eviews 9 Software

In summarizing the results obtained on the unit root tests in Table 5.3, variables such as RGDP, LGREV, LPINV, LINR, LINF and LER are stationary in level when utilizing both LLC and IPS unit root tests at 1, 5 and 10 percent level of significance under intercept as well as intercept and trend model specifications. Hence, RGDP, LGREV, LPINV, LINR, LINF and LER are integrated to the order of zero (*I (0)*).

Table 5.4 Panel Unit root tests results for some of the key variables at first difference

First Difference						
		With Intercept		With Intercept and Trend		
Variable	**Test**	**Statistic**	**P-Value**	**Statistic**	**P-Value**	**Order of Integration**
LGEXP	LLC	-9.49321	0.0000*	N/A	N/A	*I*(1)
	IPS	-12.9263	0.0000*	N/A	N/A	*I*(1)
LM2	LLC	-11.8458	0.0000*	-11.1788	0.0000*	*I*(1)
	IPS	-10.6708	0.0000*	-9.66622	0.0000*	*I*(1)
LER	LLC	N/A	N/A	N/A	N/A	N/A
	IPS	-7.74873	0.0000*	N/A	N/A	*I*(1)

NB: */**/*** denotes significance at 1%, 5% and 10% respectively
Source: Author's own computations using Eviews 9 Software

According to the results obtained on the unit root tests in Table 5.4, variables such as LEXP, LM2, and LER (IPS test) are stationary after first difference at 1, 5 and 10 percent level of significance respectively under intercept (LGEXP and LER). LM2 variable is also stationary after first difference under intercept and trend model specifications. Hence, LGEXP, LER (when using IPS unit root test) and LM2 are integrated to the order of one (*I (1)*).

Since attention is given to the nature of the trend of the time series, the results obtained on intercept and trend model specification are used to make the final decision on the order of integration for all key variables of this study. Moreover, the unit root test results obtained using LLC unit root test are used since this test assumes homogeneity. The reason for this is because the effects of both fiscal and monetary policy on economic growth in Southern African Custom Union member economies are homogeneous (as fully discussed in chapter two, section 5.2 (quantitatively) and still to be explored further in section 5.3.6). Hence, the variables such as RGDP, LGEXP, LGREV, LPINV, LINR, LINF and LER are integrated to the order of zero (*I (0)*) whereas only M2 variable is integrated to the order of one (*I (1)*). The next step is to test whether there is evidence of cointegration or not. Hence, a suitable cointegration test is applied and its results are also interpreted in the next section.

5.3.4 Cointegration test

This study relies on the main two panel cointegration tests which are based on the Engle-Granger (1987) cointegration method. However, since the LLC unit root test results were used to determine the order of integration, only the Kao (1999) cointegration test will be performed, since it also assumes homogeneity among cross sections' individual trends and intercepts just like the LLC unit root test. Furthermore, because of the characteristic of homogeneity that is displayed on the graphical presentations for fiscal and monetary policy variables in SACU member economies, a single common cointegrating equation in all SACU member economies can be expected. Hence Table 5.5 presents the Kao (1999) cointegration test results (see Appendix 4).

H_0 : There is no cointegration

H_A : There is cointegration

Table 5.5 Kao (1999) Cointegration Test Results

Test	**ADF T-Statistic**	**Probability**	**Conclusion**
Kao Cointegration Test	-2.997528	0.0014*	Reject H_0

NB: */**/*** denotes significance at 1%, 5% and 10% respectively.
Source: Author's own computations using Eviews 9 Software

At 5 percent level of significance, the null hypothesis is rejected since the probability for the observed ADF t statistic is less than 1, 5 and 10 percent level of significance. Hence, there is a long run relationship between the independent variable (RGDP) and independent variables (GEXP, GREV, PINV, INR, INF, ER and M2). Since the cointegration test confirmed the existence of a long run relationship between the dependent variable and independent variables, it is imperative to determine the lags for both dependent and independent variables at which the estimates for both short and long relationship would be optimal. Hence, the next section presents optimal lags for both dependent and independent variables.

5.3.5 Optimal lags selection

Selecting the optimal lags length is very important as far as ARDL/PARDL model building is concerned. The information criteria such as Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannah Quinn Information Criterion (HQIC) are used to identify

the most optimal lag(s) for the dependent variable and the independent variables. All information criteria should be small as far as possible (Brooks, 2008). Hence, Table 5.6 presents the optimal lag(s) for the dependent variable chosen by the mentioned above information criteria (see Appendix 5).

Table 5.6 Optimal lags selection for the dependent variable

Dependent Variable:			
RGDP			
Lag	**AIC**	**SIC**	**HQIC**
1	4.88	7.13	5.79
2	4.68	7.02	5.63
3	4.86	7.30	5.85
4	3.80*	6.33**	4.83***

NB: */**/*** denotes lag order selected by AIC, SIC and HQIC respectively
Source: Author's own computations using Eviews 9 Software

Table 5.6 shows that all information criteria (AIC, SIC and HQIC) select lag order four. Therefore, the optimal lag order for the dependent variable is four. The optimal lag(s) for the independent variables must also be chosen. Hence, Table 5.7 presents the optimal lags for the independent variables chosen by the mentioned above information criteria (see Appendix 5 also).

Table 5.7 Optimal lag selection for the independent variables

Independent Variables	Information Criteria	Lags		
		1	2	3
LGEXP	AIC	5.03	4.99	3.80*
	SIC	6.26**	6.88	6.33
	HQIC	5.53	5.76	4.83***
LGREV	AIC	5.03	4.99	3.80*
	SIC	6.26**	6.88	6.33
	HQIC	5.53	5.76	4.83***
LPINV	AIC	5.03	4.99	3.80*
	SIC	6.26**	6.88	6.33
	HQIC	5.53	5.76	4.83***
LINR	AIC	5.03	4.99	3.80*
	SIC	6.26**	6.88	6.33
	HQIC	5.53	5.76	4.83***
LINF	AIC	5.03	4.99	3.80*
	SIC	6.26**	6.88	6.33
	HQIC	5.53	5.76	4.83***
LER	AIC	5.03	4.99	3.80*
	SIC	6.26**	6.88	6.33
	HQIC	5.53	5.76	4.83***
LM2	AIC	5.03	4.99	3.80*
	SIC	6.26**	6.88	6.33
	HQIC	5.53	5.76	4.83***

NB: */**/*** denotes lag order selected by AIC, SIC and HQIC respectively
Source: Author's own computations using Eviews 9 Software

As far as the independent variables are concerned, information criteria AIC and HQIC select lag order three whereas SIC selects lag order one. In acknowledging the fact that for the independent variables AIC and HQIC select lag three, it can be concluded that the optimal lag order for the independent variables is three as shown in Table 5.7. Hence, the PARDL model to be estimated is

ARDL (4,3,3,3,3,3,3,3). Using the suitable PARDL model estimator, the long and short run coefficients for the selected lags for both dependent and independent variables must be estimated. Hence, the next section presents the motivations for the selected PARDL model estimator as well as the estimates for both long and short run coefficients.

5.3.6 Long and short run panel Auto Regression Distributed Lags model estimates

In this study, SACU member economies are 5 (N) whereas the variables under study are 8 (including the dependent variable), therefore the first assumption is satisfied since N is less than the number of variables under study. The second assumption which in short states that there should be reasons and motivations on why it should be expected that the effects of both fiscal and monetary policy should be similar across SACU member economies in the long run, is fully explored as follows:

In terms of the fiscal policy, all SACU member economies adopted a medium term expenditure framework of which its effects have been similar in all SACU member economies since these economies have been recording permanent fiscal deficits as per SACU (2017) report.

As far as monetary policy is concerned, Namibia, Lesotho, Swaziland and South Africa use the same monetary policy structure (South Africa being the common monetary area host). This simply implies that the effect of monetary policy on economic performance in these four economies, is the same although the magnitude of the effect in South Africa is bigger than that of three CMA economies. Botswana's monetary policy structure is similar to that of the CMA economies. One example is the target for the official inflation rate of 4 to 6 percent that has also been adopted by the Southern African CMA economies.

In light of this, the assumptions behind PARDL pooled means group (PMG) model estimator are met. In short, the PMG estimator enforces an assumption of homogeneity over the long run and heterogeneity over the short run on the cross sections. This simply means that the panel ARDL long run estimates are the same across all SACU member economies when short run coefficients differ across SACU member economies. Hence, the model ARDL (4,3,3,3,3,3,3,3) is estimated by PMG model estimator. The next section presents long run relationship results for the SACU member economies for the period of 1980 to 2017.

5.3.6.1 Long Run Panel Auto Regression Distributed Lags Estimates

The following table presents long run PARDL estimates for SACU member economies for the period of 1980 to 2017 (see Appendix 6);

Table 5.8 Long Run PARDL estimates for SACU member economies

Model: ARDL (4,3,3,3,3,3,3,3)

Dependent Variable: RGDP				
Explanatory Variable	**Coefficient**	**Standard Error**	**T-Statistic**	**Probability**
LGEXP	2.470549	0.452050	5.465218	0.0000*
LGREV	0.269042	0.252323	1.066260	0.2911
LPINV	-0.07330	0.006242	-11.74388	0.0000*
LINR	-1.094526	0.079505	-13.76682	0.0000*
LINF	1.859188	0.178411	10.42081	0.0000*
LER	-2.798533	0.114331	-24.42081	0.0000*
LM2	1.578238	0.265482	5.944813	0.0000*

NB: */**/*** denotes significance at 1%, 5% and 10% respectively
Source: Author's own computations using Eviews 9 Software

In terms of the fiscal policy, the results represented in Table 5.8 show that a 1 percent increase in LGEXP would significantly results in a 2.47 percent increase in RGDP. This simply means that a 1 percent increase in logged government expenditure makes economic growth to record a significant 2.47 percent increase in SACU member economies in the long run. This finding confirms the Keynesian fiscal policy theory which emphasizes that positive shocks on government expenditure reflect positively on economic growth and/or performance.

As shown in chapter three under the empirical literature section, several writers confirmed this hypothesis to be true in SACU member economies. In South Africa, Ocran (2011) found that government expenditure influenced economic growth positively in the long run and the relationship was significant. In addition to support the Keynesian fiscal policy hypothesis in South Africa, Leshoro (2017) also found that government spending influenced economic growth significantly in the long run. The influence is positive in nature. In Lesotho, Thabane and Lebina

(2016) also found that government expenditure influences economic growth positively and significantly in the long run between 1980 and 2017 using the ARDL method.

In Swaziland, Botswana and Namibia, the Keynesian hypothesis about government expenditure and economic growth was also confirmed to be true as per studies by Dlamini (2018), Sukumaran Nair (2016) and Shafuda (2015). All of these studies established a positive and significant relationship between government expenditure and economic growth in the long run.

Table 5.8 also shows that a 1 percent increase in LGREV would insignificantly result in a 0.27 percent increase in RGDP. This simply means that a 1 percent increase in logged government revenue leads to a 0.27 percent increase in economic growth recorded in SACU member economies in the long run. However, this association of government revenue and economic growth in SACU member economies is insignificant. This finding reflects some part of the problem statement as discussed in chapter one which, in short, indicates that the SACU member economies have not been generating enough revenue to cover their overall public expenditures (SACU, 2017). To show this, the results indicate that the proportion at which economic growth increase due a percentage change in government revenue in SACU economies (0.27 percent) is less than the proportion at which economic growth increase due a percentage change in government expenditure (2.47 percent) in the long run.

Andrade (2014) emphasized that statistically "crowding out" effect of private investment can be realized if the significant positive changes in government expenditure and interest rates lead to a negative significant (affect economic output direly) or insignificant change in private investment or any proxy variable for private investment.

Hence, in examining the hypothesis of "crowding out" of private investment as emphasized by classical economists, the long run estimated ARDL model suggests that a 1 percent increase in the logged real interest rate results in a 1.09 percent decrease in economic growth, and 1 percent increase in logged government expenditure results to 2.47 percent increase on economic growth in SACU member economies. Using the basic Keynesian macroeconomic model for mathematical demonstrations, the claim emphasized by classical economists can be explored as follows;

$$RGDP = C + (I_0 - I_1 r) + G \quad (5.1)$$

Filling in the long run coefficients for the logged government expenditure, private investment and real interest rate from the estimated ARDL model, equation 5.1 yields:

$$RGDP = C + (-0.07330 - 1.0945r) + 2.4705 \quad (5.2)$$

In interpreting the equation 5.2, the government expenditure seems to be affecting economic growth positively by 2.4705 percent which results in an increase in the real interest rate as proposed by the classical economists, hence bring up the negative net effect on the net investment while keeping private consumption (C) fixed. Due to this, it can be concluded that the crowding out effect hypothesis does hold in the Southern African Custom Union (SACU) over the long run, for the period under consideration.

In terms of the monetary policy, LINF and LM2 have a positive and significant long run relationship with RGDP. The results in Table 5.8 shows that a 1 percent increase in logged inflation and M2 money supply would lead to a 1.86 and 1.58 percent increase in economic growth in SACU member economies respectively. These findings confirm the theory of monetarism and monetarists which in short articulates that positive shocks on money supply and inflation influence economic growth positively.

Inflation has been affecting economic growth positively as the SACU member economies channeled their monetary policy into achieving price stability. That is, Inflation targeting is a framework that has been adopted by these economies to attain sustainable economic growth. Furthermore, there are studies that also established positive relationship between money supply, inflation and economic growth. These studies include that of Precious (2014), Chipote and Makhetha (2014), Seleteng et al. (2017), Ndzinisa (2008) and Obdaba and Eita (2010) in the case of South Africa, Lesotho, Botswana, Swaziland and Namibia respectively.

LINR and LER have a negative and significant long run relationship with RGDP. As shown in Table 5.8, a 1 percent increase in logged real interest rate and official exchange rate would lead to a 1.09 and 2.799 percent decrease in economic growth in SACU member economies respectively. These findings are consistent with classical and Keynesian macroeconomic theories which, in short, emphasize that the shocks in the real interest rate directly affects investment decisions which might affect the economy in both the short and long run.

There are studies that suggest similar findings like that of Precious (2014), Chipote and Makhetha (2014), Seleteng et al. (2017), Ndzinisa (2008) and Obdaba and Eita (2010) in the case of South Africa, Lesotho, Swaziland and Namibia respectively.

5.3.6.2 Cross sectional short run Panel Auto Regression Distributed Lags estimates

PMG ARDL model estimator forces the short run coefficients to be heterogeneous by cross sections. That is, the impact of fiscal and monetary policy on economic growth are bound to differ in SACU member economies in the short run. Hence, Tables 5.9, 5.10, 5.11, 5.12 and 5.13 present short run coefficients results for South Africa, Lesotho, Swaziland, Botswana and Namibia respectively (see Appendix 6 also).

- **Short run coefficients for South Africa**

Table 5.9 Short Run Coefficients for South Africa

Model: ARDL (4,3,3,3,3,3,3,3)

Dependent Variable: D(RGDP)								
Lag Order	$\Delta RGDP$	$\Delta LGEXP$	$\Delta LGREV$	$\Delta LPINV$	$\Delta LINR$	$\Delta LINF$	ΔLER	$\Delta LM2$
0		3.480481 (0.9812)	2.165970 (0.9831)	-0.05133 (0.0002)*	-0.5869 (0.2011)	-0.6581 (0.7338)	-7.25456 (0.5717)	23.630 (0.7819)
1	-0.7279 (0.0003)*	48.9541 (0.8308)	9.111717 (0.8988)	0.002760 (0.4887)	-0.5416 (0.1146)	-3.2759 (0.0655) ***	1.471256 (0.9475)	-5.136 (0.9388)
2	-0.3733 (0.0005)*	10.1029 (0.9502)	3.06508 (0.9370)	0.02499 (0.0003)*	-1.4378 (0.0226)**	-2.0190 (0.1745)	1.471298 (0.9475)	-13.621 (0.3563)
3	-0.2346 (0.0005)*							
Speed of Adjustment								
ECT(-1)	-0.392732 (0.0001)*							

N.B: */**/*** denotes significance at 1%, 5% and 10% respectively.
: The value inside the parentheses is the corresponding probability value for the t statistic
Source: Author's own computations using Eviews 9 Software

In the short run, LGEXP and LGREV have insignificant mixed effects on RGDP for the period under consideration as shown in Table 5.9. The results show that both logged government expenditure and revenue have positively impacted economic growth at zero lagged period in South Africa. However, these effects are not important since government expenditure and revenue are insignificant in the short run. The error correction term is 0.3927 which indicates that 39.27 percent of disequilibrium will be corrected in next period which implies that the economy would slowly reach a steady state. In comparing these short run fiscal policy results, Khamfula (2004) (whose study utilized simultaneous equations method) indicated that government expenditure and revenue were positively but insignificantly related to economic growth in South Africa.

In terms of the monetary policy, logged real interest rate (LINR) affects economic growth negatively as theoretically expected from zero lagged period to two lagged periods. However, the negative effect of logged real interest rate on economic growth is only significant at two lagged period. Logged inflation is also negatively related to economic growth in the short run in a case of South Africa from zero lagged period to two lagged period by 0.6581, 3.2759 (statistically significant at 10 percent level of significance) and 2.0190 percent respectively. This finding contradicts the Keynesian theory which indicates that inflation should have a positive relationship with economic growth. Nevertheless, Datta and Mukhopadhyuay (2011) also found that inflation was negatively related to economic growth in South Africa in the short run. The logged exchange rate (LER) only affects economic growth positively by 7.25 percent at zero lagged period and affects economic growth negatively thereafter (lagged period one and two) by 1.47 percent each. However, these mixed effects on economic growth are not significant. These mixed effects are in line with theoretical expectations as discussed in the previous chapter. In short, exchange rate is expected to influence economic growth either positively or negatively in both the short and long run. Again to refer to the "mixed effects", it can be said that the exchange rate fluctuates between zero lagged period and two lagged period. This finding on the exchange rate complements the results obtained by Aghion et al. (2009), which indicate that if the exchange rate fluctuates, economic growth increases and portrays the same trend that is displayed by the exchange rate. Lastly, logged M2 money supply insignificantly affects economic growth positively at zero lagged period, and later (lagged period one and two) affects economic growth negatively insignificantly. The negative effects of M2 money supply on economic growth are in line with the quantity theory of money which emphasizes that due to an increase in the interest rates, money supply decreases.

In assessing whether the hypothesis of "crowding out" does hold in the short run or not, the following needs to be observed from the results presented in Table 5.9. The logged government expenditure is not an important variable though the influence on economic growth is positive whereas the logged private investment is an important variable at zero and two lagged periods with a mixed effect (positive and positive). The logged real interest rate (LINR) seems to be affecting economic growth negatively throughout zero lagged period to two lagged periods. Due to this, this results do not indicate evidence of the "crowding out" hypothesis of private investment in the short run since the hypothesis requires the government expenditure and the real interest rate to be significantly positive, and private investment to be significantly negative.

- **Short run coefficients for Lesotho**

Table 5.10 Short Run Coefficients for Lesotho

Model: ARDL (4,3,3,3,3,3,3,3)

Dependent Variable: D(RGDP)								
Lag Order	$\Delta RGDP$	$\Delta LGEXP$	$\Delta LGREV$	$\Delta LPINV$	$\Delta LINR$	$\Delta LINF$	ΔLER	$\Delta LM2$
0		-10.3682 (0.4428)	4.895610 (0.7738)	-0.11359 (0.0004)	0.085748 (0.3140)	7.460731 (0.1149)	-14.9902 (0.3071)	-9.42866 (0.3836)
1	-0.77889 (0.0000)*	-5.80665 (0.7618)	-5.59398 (0.6941)	0.000566 (0.9592)	0.072251 (0.4312)	-0.71491 (0.6999)	5.370917 (0.7649)	-5.65579 (0.7028)
2	-0.40269 (0.0002)*	1.239639 (0.9420)	-10.8031 (0.4451)	0.026106 (0.0295)**	0.504529 (0.0026)*	6.567625 (0.22221)	-13.3421 (0.4250)	-14.7723 (0.3563)
3	-0.53011 (0.0003)*							
Speed of Adjustment								
ECT(-1)	-0.505275 (0.0000)*							

N.B: */**/*** denotes significance at 1%, 5% and 10% respectively.

: The value inside the parentheses is the corresponding probability value for the t statistic

Source: Author's own computations using Eviews 9 Software

In the short run, LGEXP and LGREV have insignificant mixed effects on RGDP for the period under consideration as shown in Table 5.10. The results show that logged government expenditure has negatively impacted economic growth at zero and one lagged period in Lesotho. The logged government revenue impacts economic growth positively at zero lagged period, and thereafter (first and second lagged periods) impacts economic growth negatively. However, these effects are not important since logged government expenditure and revenue are insignificant in the short run. The error correction term is 0.5053, which indicates that 50.53 percent of disequilibrium will be corrected in next period, which implies that the economy would adequately reach a steady state. In comparing these short run fiscal policy results, Thamae (2011) also obtained similar results where government expenditure and revenue insignificantly influenced economic growth negatively in the short run in the case of Lesotho.

In terms of the monetary policy, logged real interest rate (LINR) affects economic growth positively from zero lagged period to two lagged periods. However, the positive effect of logged real interest rate on economic growth is only significant at two lagged periods. As per monetarists' economics, increasing interest rates decreases money supply available in circulation. This hypothesis is reflected in the results in Table 5.10, as the estimated coefficient for the logged M2 money supply in the short run are negative. Logged inflation has mixed effects on economic growth in the short run in the case of Lesotho from zero lagged period to two lagged periods. At zero and the second lagged period, logged inflation insignificantly influences economic growth positively, which is in line with the theoretical expectation that higher but manageable inflation drives economic growth. In contrast, economic growth in the first lagged period was negatively influenced by inflation insignificantly. The logged exchange rate (LER) only affects economic growth negatively at zero and two lagged periods and affect economic growth positively at the first lagged period. All of these effects on economic growth by the logged exchange rate are not significant. In other words, it can be said that the exchange rate fluctuates between zero lagged period and two lagged periods. This finding on the exchange rate complements the results obtained by Aghion et al. (2009) which indicate that if the exchange rate fluctuates, economic growth increases and portrays the same trend that is displayed by the exchange rate.

In assessing whether the hypothesis of "crowding out" does hold in the short run or not, the following needs to be noticed from the results presented in Table 5.10. The logged government

expenditure is not an important variable though the influence on economic growth is mixed whereas the logged private investment is an important variable only at two lagged periods with a mixed effect (negative at zero lagged period and positive at the first and the second lagged period). The logged real interest rate (LINR) seems to be affecting economic growth positively throughout zero lagged period to two lagged periods (only significant at the second lagged period). Due to this, this results do not indicate any evidence of the "crowding out" hypothesis of private investment in the short run since the hypothesis requires the government expenditure and the real interest rate to be significantly positive, and private investment to be significantly negative.

- **Short run coefficients for Swaziland**

Table 5.11 Short Run Coefficients for Swaziland

Model: ARDL (4,3,3,3,3,3,3,3)

Dependent Variable: D(RGDP)								
Lag Order	$\Delta RGDP$	$\Delta LGEXP$	$\Delta LGREV$	$\Delta LPINV$	$\Delta LINR$	$\Delta LINF$	ΔLER	$\Delta LM2$
0		2.6614 (0.0034)*	3.7588 (0.0001)*	-0.0506 (0.0000)*	1.3967 (0.0000)*	2.56191 (0.0000)*	-36.2213 (0.0000)*	-14.3212 (0.0001)*
1	0.8897 (0.0000) *	5.9162 (0.0000)*	-0.6394 (0.0709) ***	-0.1328 (0.0000)*	0.4276 (0.0000)*	-3.5870 (0.0000)*	29.2389 (0.0000)*	-3.1988 (0.0010)*
2	0.8752 (0.0000)*	19.8985 (0.0000)*	16.4846 (0.0000)*	-0.2265 (0.0000)*	0.7175 (0.0000)*	3.4239 (0.0000)*	-39.4900 (0.0000)*	-17.6193 (0.0000)*
3	0.6634 (0.0000)*							
Speed of Adjustment								
ECT(-1)	-0.600717 (0.0000)*							

N.B: */**/*** denotes significance at 1%, 5% and 10% respectively.

: The value inside the parentheses is the corresponding probability value for the t statistic

Source: Author's own computations using Eviews 9 Software

In the short run, LGEXP and LGREV have significant effects on RGDP for the period under consideration as shown in Table 5.11. The results show that logged government expenditure has

positively impacted economic growth between zero and two lagged periods in Swaziland which is consistent with Keynesian fiscal policy theory. The results also show that the logged government revenue has impacted economic growth both positively (zero and two lagged periods) and negatively (at one lagged period). These effects are important since the logged government expenditure and revenue coefficients are significant in the short run. The error correction term is 0.6007 which indicates that 60.07 percent of disequilibrium will be corrected in the next period which implies that the economy would substantially reach a steady state.

In terms of the monetary policy, logged real interest rate (LINR) affects economic growth positively between zero and two lagged periods. These positive effects of logged real interest rate on economic growth are significant. Due to the positive impact of the logged real interest rate, logged M2 money supply influence economic growth significantly negatively, which is consistent with monetarists' economics which emphasizes that an increased/positive real interest rate decreases money supply available in circulation in both the short and long run. It is for this reason that the logged M2 money supply significantly affects economic growth negatively between zero and two lagged periods by 14.32, 3.19 and 17.62 percent respectively as shown in Table 5.11. Logged inflation also has significant mixed effects on economic growth in the short run in Swaziland from zero and two lagged periods. At zero lagged period, logged inflation impacts economic growth positively by 2.56 percent and between lagged period one and two, logged inflation impacts economic growth negatively by 3.59 and 3.42 percent respectively, as shown in Table 5.11. The logged exchange rate (LER) appreciates significantly at zero and two lagged periods and also depreciated significantly at the first lagged period. In other words, it can be said that the exchange fluctuates between zero lagged period and two lagged periods. This finding on the exchange rate complements the results obtained by Aghion et al. (2009), which indicate that if the exchange rate fluctuates, economic growth increases, and portrays the same trend that is displayed by the exchange rate.

In assessing whether the hypothesis of "crowding out" does hold in the short run or not, the following needs to be noticed from the results presented in Table 5.11. The logged government expenditure is an important variable which influences economic growth positively whereas the logged private investment is also an important variable between zero and two lagged periods, with a negative effect on economic growth. The logged real interest rate (LINR) seems to be increasing

since the estimated coefficients are positive between zero and two lagged periods. Due to this, the results do indicate evidence of the "crowding out" hypothesis of private investment in the short run in the case of Swaziland since the hypothesis requires the government expenditure and the real interest rate to be significantly positive, and private investment to be significantly negative.

- **Short run coefficients for Botswana**

Table 5.12 Short Run Coefficients for Botswana

Model: ARDL (4,3,3,3,3,3,3,3)

Dependent Variable: D(RGDP)								
Lag Order	$\Delta RGDP$	$\Delta LGEXP$	$\Delta LGREV$	$\Delta LPINV$	$\Delta LINR$	$\Delta LINF$	ΔLER	$\Delta LM2$
0		-23.3529 (0.6756)	-7.29499 (0.2446)	-0.39709 (0.0001)*	1.352260 (0.0034)*	5.425219 (0.4442)	-15.7523 (0.8481)	-13.1036 (0.5952)
1	1.3842 (0.0004)*	-4.67939 (0.9510)	1.262016 (0.6906)	1.352260 (0.0000)*	1.767124 (0.0017)*	-4.77980 (0.8511)	28.14834 (0.6355)	-20.0128 (0.5631)
2	1.6581 (0.0003)*	5.2447 (0.9588)	1.9986 (0.6180)	-0.2059 (0.0001)*	1.4156 (0.0034)*	-3.0177 (0.8563)	28.1741 (0.6768)	-10.2499 (0.6672)
3	1.0817 (0.0006)*							
Speed of Adjustment								
ECT(-1)	-0.672237 (0.0003)*							

N.B: */**/*** denotes significance at 1%, 5% and 10% respectively.
: The value inside the parentheses is the corresponding probability value for the t statistic.
Source: Author's own computations using Eviews 9 Software.

In the short run, LGEXP and LGREV have insignificant effects on RGDP for the period under consideration as shown in Table 5.12. The results show that logged government expenditure has negatively (between zero and one lagged periods) and positively (at two lagged period) impacted economic growth in Botswana. The results also show that logged government revenue has impacted economic growth both negatively (zero lagged period) and positively (between one and two lagged period). These effects are not important since government expenditure and revenue

coefficients are insignificant in the short run. The error correction term is 0.6722 which indicates that 67.22 percent of disequilibrium will be corrected in the next period which also implies that the economy would substantially reach a steady state. These results complement those of Koitsiwe (2018), which also indicate that government expenditure and revenue have insignificant mixed effects on economic growth/development in the short run for the period of 1993 to 2016.

In terms of the monetary policy, logged real interest rate (LINR) affects economic growth positively between zero and two lagged periods. These positive effects of logged real interest rate on economic growth are significant. Due to the positive impact of the logged real interest rate, logged M2 money supply influenced economic growth negatively (insignificantly) by 13.10, 20.01 and 10.25 percent respectively as shown in Table 5.12. This is consistent with monetarist' economics, which emphasizes that an increased/positive real interest rate decreases money supply available in circulation in both the short and long run. Logged inflation has insignificant mixed effects on economic growth in the short run in the case of Botswana from zero and two lagged periods. At zero lagged period, logged inflation impacts economic growth positively by 5.43 percent and between lagged period one and two, logged inflation impacts economic growth negatively by 4.78 and 3.02 percent respectively as shown in Table 5.12. This shows that Botswana's inflation rate has been decreasing in the short run, Bhuiyan (2008) indicates that this is because an increase in the real interest rate consequently resulted in an appreciation of the exchange rate. Due to this, Botswana's logged exchange rate (LER) appreciated (insignificantly) between zero and two lagged periods.

In assessing whether the hypothesis of "crowding out" does hold in the short run or not, the following needs to be noticed from the results presented in Table 5.12. The logged government expenditure is not an important variable which has a mixed influence on economic growth, whereas the logged private investment is an important variable between zero and two lagged periods with a mixed effect on economic growth. The logged real interest rate (LINR) seems to be insignificantly increasing since the estimated coefficients are positive but insignificant between zero and two lagged periods. Due to this, the results do not indicate evidence of the "crowding out" hypothesis of private investment in the short run in the case of Botswana, since the hypothesis requires the government expenditure and the real interest rate to be significantly positive, and private investment to be significantly negative.

- **Short run coefficients for Namibia**

Table 5.13 Short Run Coefficients for Namibia

Model: ARDL (4,3,3,3,3,3,3,3)

Dependent Variable: D(RGDP)								
Lag Order	$\Delta RGDP$	$\Delta LGEXP$	$\Delta LGREV$	$\Delta LPINV$	$\Delta LINR$	$\Delta LINF$	ΔLER	$\Delta LM2$
0		12.39378 (0.7885)	16.61082 (0.9596)	-0.00688 (0.0170)**	1.508785 (0.0032)*	-0.2928 (0.9125)	4.324664 (0.8321)	-19.4172 (0.5728)
1	-0.7645 (0.0003)*	-16.6381 (0.8339)	25.40598 (0.9683)	0.058026 (0.0000)*	0.777795 (0.0175)**	-0.0808 (0.9566)	-21.7206 (0.4089)	2.058197 (0.9573)
2	0.1183 (0.2570)	-7.3899 (0.8384)	-39.4271 (0.9076)	0.0646 (0.0000)*	-0.2958 (0.1313)	1.0938 (0.6383)	9.3650 (0.8307)	10.9970 (0.6437)
3	0.3610 (0.0077)*							
Speed of Adjustment								
ECT(-1)	-0.221833 (0.0011)*							

N.B: */**/*** denotes significance at 1%, 5% and 10% respectively.
: The value inside the parentheses is the corresponding probability value for the t statistic.
Source: Author's own computations using Eviews 9 Software.

In the short run, LGEXP and LGREV have insignificant mixed effects on RGDP for the period under consideration as shown in Table 5.13. The results show that logged government expenditure has positively (at zero lagged period) and negatively (between one and two lagged periods) impacted economic growth in Namibia. For the most part, logged government expenditure (LGEXP) affected economic growth in Namibia in the short run. This results confirm the findings obtained by (Shafuda, 2015) which also indicated the government expenditure influenced economic growth negatively in the short run by 0.07 percent between 1980 and 2012. The results also show that logged government revenue has also impacted economic growth positively (between zero and one lagged periods) and negatively (at two lagged periods). However, these effects are not important since logged government expenditure and revenue coefficients are insignificant in the short run. These results confirm the findings obtained by Nkhalamo and

Sheefeni (2017), which indicated that government revenue affected economic growth positively, since for the most lagged periods logged government revenue influenced economic growth positively as shown in Table 5.13 above. The error correction term is 0.2218 which indicates that 22.18 percent of disequilibrium will be corrected in the next period which implies that the economy would slowly reach a steady state.

In terms of the monetary policy, logged real interest rate (LINR) affects economic growth positively (between zero and one lagged periods) and negatively at the second lagged period. Only the positive effects of logged real interest rate on economic growth are significant. Logged inflation has insignificant mixed effects on economic growth in the short run in the case of Namibia from zero and two lagged periods. Logged inflation impacts economic growth negatively by 0.2928 and 0.0808 percent respectively between zero and one lagged periods. Logged inflation also impacts economic growth positively by 1.09 percent as shown in Table 5.13. The logged exchange rate (LER) appreciated at zero lagged period and later (between one and two lagged period) depreciated insignificantly. Lastly, logged M2 money supply insignificantly affects economic growth negatively at zero lagged period by 19.42 percent as shown in Table 5.13. As also reflected in Table 5.13, the results show that for the last lagged periods, logged M2 money supply impacted economic growth positively, though the impacts are statistically insignificant. In assessing the cause(s) of these mixed effects, Sheefeni (2013), indicates that this is because of the side effects of the implementation of the current monetary policy framework that has the limited flexibility required to sustain or maintain different unexpected economic shocks.

In assessing whether the hypothesis of "crowding out" does hold in the short run or not, the following needs to be noticed from the results presented in Table 5.13. The logged government expenditure is not an important (insignificant) variable which has a mixed influence on economic growth whereas the logged private investment is an important variable between zero and two lagged periods with a mixed effect on economic growth. The logged real interest rate (LINR) seems to be having a mixed effect on economic growth between zero and two lagged periods. Only positive effects of the logged real interest rate on economic growth are statistically significant. Due to this, the results do not indicate evidence of the "crowding out" hypothesis of private investment in the short run in the case of Namibia since the hypothesis requires the government expenditure and the real interest rate to be significantly positive, and private investment to be significantly negative.

5.3.7 Granger Causality test

Engle and Granger (1987) indicated that if cointegration exists between two variables (dependent and independent variable) in the long-run model, there must either bi-directional or unidirectional causality between them. The Granger Causality test for two stationary variables can be performed to test for the following hypothesis:

$H_0 = x_t$ does not cause y_t

$H_1 = x_t$ does cause y_t

Since lag three for the independent variables and lag four for the dependent variable were used to estimate the fundamental ARDL model, Granger Causality test was then performed at the maximum lag of four. Hence, Table 5.14 presents Granger Causality test results (see Appendix 6).

Table 5.14 Granger Causality Test Results

Null Hypothesis	Obs.	F-Statistic	Probability	Conclusion
LGEXP does not Granger cause RGDP	170	4.43182	0.0125**	Causality
RGDP does not Granger cause LGEXP		0.59687	0.6654	No Causality
LGREV does not Granger cause RGDP	170	0.35953	0.8371	No Causality
RGDP does not Granger cause LGREV		1.83743	0.1242	No Causality
LPINV does not Granger cause RGDP	170	0.75065	0.5589	No Causality
RGDP does not Granger cause LPINV		0.25901	0.9038	No Causality
LINR does not Granger cause RGDP	170	3.04817	0.0187**	Causality
RGDP does not Granger cause LINR		1.00738	0.4054	No Causality
LINF does not Granger cause RGDP	170	3.43065	0.0101**	Causality
RGDP does not Granger cause LINF		1.08249	0.3670	No Causality
LER does not Granger cause RGDP	170	2.09809	0.0835***	Causality
RGDP does not Granger cause LER		0.22337	0.9251	No Causality
LM2 does not Granger cause RGDP	170	0.61162	0.6549	No Causality
RGDP does not Granger cause LM2		1.84605	0.1226	No Causality

NB: */**/*** denotes significance at 1%, 5% and 10% respectively
Source: Author's own computations using Eviews 9 Software

The results presented in Table 5.14 above show that for the fiscal policy, the RGDP does not cause LGEXP and LGREV. Instead, LGEXP does Granger-cause RGDP. This simply implies that the economic growth of the Southern African Custom Union member economies is affected by changes in government spending (rather than government revenue since LGREV does not Granger-cause RGDP) which confirms the Keynesian theory of the fiscal policy if government spending is treated as the functional policy instrument. Further, the causal link between government spending and economic growth is found to be uni-directional since it runs in one direction (LGEXP→RGDP).

In terms of the monetary policy, economic growth does not cause the principal monetary policy instruments which are real interest rate, inflation and exchange rate. This is because of the fact that RGDP does not Granger-cause LINR, LINF and LER. Instead, these policy variables Granger-cause RGDP as reflected in Table 5.14. In simpler terms, the economic growth of the Southern African Custom Union member economies is affected by changes in real interest rate, inflation and exchange rate. In addition, the causal link between real interest rate, inflation, exchange rate and economic growth is found to be uni-directional since it runs in one direction (LINR, LINF and LER→RGDP).

These findings are consistent with monetarists and monetarism theory, which emphasizes that in the long run, high rates of economic growth can be realized due to an increase in the general price level. In other words, inflation is necessary for faster economic growth in the long run even though it might affect the economy negatively in the short run. Additionally, monetarists and monetarism theory suggest that interest rates can be used to control money supply, the very same monetary policy instrument that is viewed as the principal determinant of economic growth. In other words, the shocks in money supply can be controlled by the interest rates which in turn influence economic growth.

5.3.8 Residuals diagnostic tests

As discussed in the previous chapter, Pesaran et al. (1999) maintained that the results obtained from the estimated PARDL model may be relied on if the resulting residuals pass normality and cross section independence tests. Hence, Table 5.15 presents the results for the residuals diagnostic tests performed on the estimated PARDL model (see Appendix 7).

Normality test null hypothesis

H_0: The residuals are normally distributed.

Cross-section independence tests null hypothesis

H_0: There is no cross-sectional dependence (No serial correlation)

Table 5.15 Residuals Diagnostic Tests Results

Test	Type of the test	Test Stat.	Probability	Conclusion
Normality test	Jacque Bera	3.352346	0.1871	Fail to reject H_0
Cross Section Independence tests	Breusch and Pagan LM dependence test	17.95869	0.0557***	Fail to reject H_0
	Peseran cross-section dependence test	0.661582	0.5082	Fail to reject H_0
	Peseran scaled LM dependence test	0.585825	0.5580	Fail to reject H_0
	Bias corrected LM dependence test	1.051292	0.2931	Fail to reject H_0

NB: */**/*** denotes significance at 1%, 5% and 10% respectively
Source: Author's own computations using Eviews 9 Software

According to the results presented in Table 5.15, for normality test the null hypothesis fails to be rejected at all levels of significance since the probability values for the test statistics are greater than 1, 5 and 10 percent level of significance. Due to this, it can be concluded that the residuals are normally distributed. Furthermore, cross-section independence tests results suggest that the null hypothesis also fails to be rejected at all levels of significance. Hence, there is no cross-sectional dependence (serial correlation) on the estimated residuals.

5.4 CONCLUSION

This chapter explored data analysis to seek answers for the research questions asked in chapter one. Numerous procedures were done. First, the graphical presentations for fiscal and monetary policy as well as real gross domestic product were analyzed for Southern African Custom Union

member economies. The analysis showed that the graphical presentations for policies' variables (fiscal and monetary policy) behaved commonly across all SACU member economies even though the magnitude of the policies' variables varied by margin. In exploring further the nature of the data, descriptive statistics were calculated. The descriptive statistics confirmed the nature of data established through graphical presentations analysis.

As far as model building is concerned, the correlation matrix revealed that the predictor variables were not highly collinear against each other which indicated that the model to be built would not suffer from the problem of multicollinearity. LLC and IPS unit root tests were also carried out to determine the order of integration of all key variables. Both tests indicated that RGDP, LGEXP, LGREV, LPINV, LINR, LINF and LER are stationary at level hence they are *I (0)* variables when only LM2 is stationary after first difference, hence an *I (1)* variable. Based on the nature of the data that was established using graphical presentations and qualitative convictions gathered in chapter two, LLC unit root test (which assumes homogeneity on the individual cross-sectional time series) results were used to make a final decision on the stationarity of the key variables used in this study.

In achieving the fundamental objective of this study, that is, to investigate the impact of the two major macroeconomic policies on economic growth, the Kao (1999) cointegration test (also assumes homogeneity and single common long run relationship among cross sections) was carried out to check if indeed there was a long and/or short run relationship between economic growth and these two major macroeconomic policies. The results indicated that there was indeed a long run relationship between economic growth and these two major macroeconomic policies in the Southern African Custom Union between 1980 and 2017. After that, the optimal lags for both dependent and independent variables were determined by three main information criteria which were AIC, SIC and HQIC. Both AIC and HQIC indicated that the optimal lags for both dependent and independent variable(s) were 4 and 3 respectively. On the assumption of homogeneity and cross sections being less than the variables under study, Pooled Mean Group (PMG) model estimator was used to estimate the model ARDL (4.3,3,3,3,3,3,3) so that short and long run relationships would be known and critically analyzed. Although this study assumed homogeneity on the effects of fiscal and monetary policy on economic growth in SACU member economies over the long run period, short run dynamic relationships between these two major macroeconomic

policies and economic growth varied across SACU member economies as hypothesized by PARDL (PMG) methodology.

Granger causality tests results indicated that there was a uni directional causality link between LGEXP and RGDP, LINR and RGDP, LINF and RGDP as well as LER and RGDP in the long run. In short, this simply means that economic growth in SACU member economies is caused by government expenditure, real interest rate, inflation and the official exchange rate in the long run.

In checking whether the statistical inferences made from the estimated ARDL model can be relied on or not, residuals diagnostic tests like normality and cross dependence (serial correlation) tests were performed. The residuals passed all of these tests which implies that the statistical inferences made on the estimated model can be relied on.

CHAPTER SIX

CONCLUSION, POLICY RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

6.1 INTRODUCTION

Conclusion, policy recommendations and limitations of the study are presented in this chapter. The first part presents a conclusion by indicating key findings of this study. The second part discloses policy implications resulting from the findings of this study. The third part which concludes this chapter presents limitations and proposed area for further research of this study.

6.2 KEY FINDINGS

The main objective of this study has been to analyze the impact of fiscal and monetary policy on economic growth in SACU member economies for the period 1980 to 2017 which was done by using panel ARDL estimation technique. In the long run, the estimated panel ARDL model results suggest that fiscal policy has significantly impacted growth positively (2.47 percent) if government expenditure is treated as the functional fiscal policy instrument rather than the government revenue. Government revenue insignificantly influences economic growth by 0.27 percent.

The estimated ARDL model results also reveal that monetary policy has positively influenced economic growth in SACU since the estimated signs complement macroeconomic theories (monetarism/monetarists and quantity theory of money) discussed in chapter three. Briefly, inflation and M2 money supply have positively influenced economic growth in SACU member economies by 1.86 and 1.58 percent respectively. In addition, real interest rate and official exchange rate influenced economic growth negatively in SACU member economies by 1.09 and 2.80 percent respectively.

As emphasized by Engle and Granger (1987) if cointegration exists between two variables, then the direction of cointegration can be uni/bidirectional in nature. As shown in the previous chapter, government expenditure, real interest rate, inflation and official exchange rate Granger-cause economic growth in SACU member economies in the long run (unidirectional causality links). These Granger causality results are in consistent with Keynesian theory for fiscal policy and monetarism/monetarists theory as fully discussed in the previous chapter.

In the short run, the impact of both fiscal and monetary policy on economic growth as well as the speed of adjustment differ across SACU member economies. Notably, in some cases these short run effects are mixed (positive and negative) across the selected lagged periods for both fiscal and monetary policy instruments under study.

In attempting to reach the specific objectives, the following key findings are revealed by this study; using graphical representations, this study realized common graphical representations in some of the fiscal and monetary policy variables as well as RGDP in SACU member economies. This finding confirmed the qualitative analysis done in chapter two which in short suggested homogeneous structures of policies. However, the graphical presentations of these two macroeconomic policies' variables were relatively similar but not exactly the same across Southern African Custom Union (SACU) member economies.

In addressing the specific objective of testing whether the two macroeconomic policies have a long run relationship with economic growth, the Kao (1999) cointegration test was utilized. The reasons for utilizing this test were fully explored in the previous chapter but in short, this test assumes a single common cointegrating equation (homogeneity) among cross sections. The results indicated that the null hypothesis of "no cointegration" could be rejected at all levels of significance which implied that there was cointegration between dependent variable and independent variables.

In extending to address another specific objective of examining whether the effects these two macroeconomic policies on economic growth are homogeneous across SACU member economies or not, graphical analysis results on these two macroeconomic policies' variables revealed that the plots of fiscal and monetary policy's variables observed relatively similar but not exactly the same presentation across SACU member economies. Furthermore, chapter two also revealed some common characteristics among SACU member economies' fiscal and monetary policies. Hence, it was concluded that the effects of both fiscal and monetary policy on economic growth in SACU member economies would be expected to be homogeneous as it should be noted that homogeneity does not necessarily imply exactly but only relatively similar.

The last specific objective which is to test whether the "crowding out" effect of private investment does hold or not in SACU member economies is fully explored as follows; the estimated long run ARDL model shows that the private investment negatively affects economic growth. This could be the result of an increased real interest rate due to rising government expenditures of SACU

member economies as proposed by the classical economists. Hence, the hypothesis of the "crowding out effect" on private investment does hold in SACU member economies between 1980 and 2017. In the short run, this hypothesis only holds in the case of Swaziland.

With respect to accepting or rejecting the null hypotheses of this study, the following needs to be observed; for the first null hypothesis, the estimated long run ARDL model shows that fiscal and monetary policy variables (except government revenue) are significant. This simply prompts for the rejection of the null hypothesis that fiscal (treating government expenditure as the only functional policy instrument) and monetary policy have no significant impact on economic growth in SACU member economies. In other words, fiscal and monetary policy have impacted economic growth significantly in SACU member economies between 1980 and 2017.

The second hypothesis which states that the impact of fiscal and monetary policy on economic growth in SACU member economies is heterogeneous, is rejected in the long run since common characteristics and graphical representations on both fiscal and monetary policy have been observed. In other words, the impact of fiscal and monetary policy on economic growth in SACU member economies is homogeneous in the long run. However, due to the utilization of the PMG PARDL model estimator this null hypothesis is not rejected in the short run. Hence, the impact of fiscal and monetary policy on economic growth in SACU member economies is heterogeneous in the short run.

6.3 POLICY IMPLICATIONS AND RECOMMENDATIONS

In terms of the fiscal policy, government expenditure and revenue (insignificantly) influence economic growth positively in SACU member economies. This implies that government intervention plays a very significant role as far as promoting economic growth is concerned. However, it should also be noted that the effect of government revenue on economic growth (0.27 percent) is less than that of government expenditure (2.47 percent) in SACU member economies which raises some serious policy considerations and/or implications. To remedy this, SACU member governments can redirect their public expenditures into investing more in human capital. Investing in human capital, among other factors can include empowering the active unemployed population with relevant skills that meet labor markets for easy employment. In that case, the tax

revenues would be more likely to increase which could play an important role in reducing government budget deficits.

However, government intervention seems to be crowding out private investment in SACU member economies since they run on budget deficits. This brings a policy concern since governments would have to finance their budget deficits by borrowing from the domestic markets which could possibly crowd out private investment. To address this policy concern, SACU member economies' central banks can make monetary policy more effective by using monetary accommodation. This simply means that during the time when the governments apply expansionary fiscal policy, the central banks can increase money supply to avoid interest rates from increasing. In short, this is commonly known as "monetizing budget deficit". Due to this, aggregate demand will increase which would consequently lead to a decrease in inventories. Consequently, firms will increase output which in turn would result in an increase in the level of income. Assuming the following expression:

$$Y = C + S \tag{6.1}$$

Where Y, C and S denote income level, consumption and savings respectively.

Making S the subject of the expression presented by equation 6.1, yields:

$$S = Y - C \tag{6.2}$$

Equation 6.2 simply implies that an increase in the level of income as explained above will result in an increase in the level of savings provided that the level of consumption remains unchanged or fixed. The resulting increment in savings will then be used to finance the large portion of budget deficit without private investment being crowded out completely. That is, only a small portion of private investment will be crowded out.

In terms of monetary policy, the official exchange rate has a negative impact on economic growth. The economic policy implication is that currency appreciation impacts economic growth positively meaning that individuals pay less for imports. Due to this, the economy will experience lower imported inflation which would reflect positively on the SACU member economies' monetary policy. Cheaper imports would then make net exports improve provided that the exports are increased or kept unchanged which consequently affects the economy positively in terms of

growth. Furthermore, since the estimated long run relationships for money supply, real interest rate and inflation with economic growth complement theoretical expectations, it can be said that the monetary policy has been effective in SACU member economies. Hence, with monetary policy measures and tools that are already in place and in use, SACU member economies can continue utilizing them to ensure prosperous monetary policy that reflects positively in driving economic growth.

6.4 LIMITATIONS OF THE STUDY AND AREAS OF FURTHER RESEARCH

Utilization of the pooled mean group (PMG) ARDL model estimator because of the fact that cross-sectional units are fewer than the variables under study, and also realizing common characteristics on fiscal and monetary policy of SACU member economies prompts a few limitations in this study. First, this study had to rely on the fundamental feature of the PMG estimator which enforces an assumption that the effect of fiscal and monetary policy on economic growth in SACU member economies are homogeneous in the long run but heterogeneous in the short run. Future studies can explore further to overcome this limitation by attempting to use ARDL models for time series data to test for heterogeneity across individual countries.

Secondly, only the primary fiscal variables (government expenditure and revenue), rather than other associating fiscal variables such gross government capital formation and government debt, were used to capture fiscal policy shocks on economic growth. This is because of lack of data for the above mentioned variables in most of the SACU region economies. However, the above limitations do not discredit the importance and the contribution of this study. It merely indicates the critical aspects that could be explored by future studies.

Furthermore, since the “crowding out” effect of private investment does hold in SACU member economies in the long run, the effectiveness of fiscal spending in the midst of the persistent budget deficits in SACU member economies could be investigated, for further research.

REFERENCES

Abdullah, H., 2006, "The impact of government expenditure on economic growth in South Africa", *Journal of Economics and Behavioral Studies 12(2),* 173-191.

Adusei, M., 2013, "Is inflation in South Africa a structural or monetary phenomenon", *British Journal of Economics and Trade 3(1),* 60-72.

Afonso, A., and Sousa, R. M. 2012, "The macroeconomic effects of fiscal policy", *Journal of Applied Economics 44(34),* 4439-4454.

Aghion, P., Bacchetta, P., Ranciere, R. and Rogoff, K., 2009, "Exchange rate volatility and productivity growth: The role of financial development", *Journal of Monetary Economics 56(4),* 494-513.

Aigner, D.J., Hsiao, C., Kapteyn, A. and Wansbeek, T., 1984, "Latent variable models in econometrics", In Z, Griliches and M.D Intriligator, eds., Handbook for Econometrics, Vol. 2, 1322-1393, North Holland, Amsterdam.

Ali, M.S.B and Mim, S.B., 2011, "What drives inflation in MANE countries?", *International Journal of Economics and Finance 3(4),*119-129.

Anderson, T.W., 1959, "On asymptotic distribution of estimates of parameters of stochastic difference equations", *Annals Journal of Mathematical Statistics 30*, 676-687.

Arif, K.M. and Ali, M.M., 2012, "Determinants of Inflation in Bangladesh", *Journal of Economics and Sustainable Development 3(12)*, 9-17.

Asghar, N., Qureshi, S. and Nadeem, M., 2015, "Institutional Quality and Economic Growth: Panel ARDL Analysis for Selected Developing Economies of Asia", *A Research Journal of South Asian Studies 30(2),* 381-403.

Audrade, J.S., 2014, "Crowding-out Effects of Public Investments in Portuguese Economy".

Ayoki, M., 2011, "Swaziland's fiscal policy: The choices ahead", MPRA Paper No. 82058, Institute of Policy Research and Analysis.

Baltagi, B.H., Grffin, J.M. and Xiong, W., 2000, "To pool or not to pool: Homogenous versus Heterogeneous estimators applied to cigarette demand", *Journal of Economics and Statistics Review 82(1)*, 117-126.

Baltagi, B.H., Kao, C. and Feng, B., 2016, "Testing cross sectional correlation in large panel data models with serial correlation", Working paper no.2016-32, Department of Economics working paper series, University of Connecticut.

Bank of Botswana, 2010, Annual Report

Bank of Namibia, 2008, Namibia's monetary policy framework, Windhoek. Retrieved on 09/06/2018, from http://www.bon.com.na

Bank of Namibia, 2008, Namibia's monetary policy framework. Windhoek. Accessed: 14/07/2018, from http://www.bon.com.na

Ban-Porath, Y., 1973, "Labour Force Participation Rates and Supply of Labour", *Journal of Political Economy 81*, 697-704.

Barro, R., 1992, "Economic Growth in a Cross Section of Countries", *quarterly Journal of Economics 106(2)*, 407-477.

Berument, H and Dincer I, N. 2008, "Measuring the effects of monetary policy for Turkey" *Bilkent University Journal of Economic Cooperation* 29(1), 83-110.

Bhattarai, K., 2011, "Impact of exchange rate and money supply on growth, inflation and interst rates in the UK", *International Journal of Monetary Policy and Finance 4(4)*,355.

Bhuiyan, R. 2008, "The Effects of Monetary Policy Shocks in a Small Open Economy: A Structural VAR Approach" Queen's University, Kingston, Ontario, Canada.

Biorn, E., 1992, "Econometrics of panel data with measurement of errors", In L. Matyas and P. Sevestre, eds., The Econometrics of Panel Data: Theory and Applications, 152-195.

Blackburne, E.F. and Frank, M.W., 2007, "Estimation of nonstationary heterogeneous panels", *Stata Journal 7(2)*, 197-208.

Blanchard, O. and Perotti, R. 2002, "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output", *Quarterly Journal of Economics 117*(4), 1329-1368.

Bonu, N.S. and Pedro, M.P., 2009, "The impact of income tax rates (ITR) on the economic development of Botswana", *Journal of Accounting and Taxation 1(1),* 008-022.

Breusch, T. and Pagan, A., 1980, "The Langrage Multiplier test and its application to model specification in econometrics", *Journal for Economic Studies Review 47,* 239-253.

Brooks, C., 2008. Introductory Econometrics For Finance, 2nd Edition, Cambridge university press, New York.

Brown, R.L., Durbin, J. and Evans, J.M., 1975, "Techniques for Testing the Consistency of Regression Relationships over Time", *Journal of the Royal Statistical Society 37(2),* 149-192.

Burguet, S., and Ruiz, J. F. 1998, "Growth through taxes and borrowing? A model of development traps with public capital", *European Journal of political Economy,* 327-344.

Calitz, E., Du Plessis, S. and Siebrits, K., 2013, "Fiscal Sustainability in South Africa: Will history repeat itself?", Stellenbosch Economic Working Paper No; 07:13, Department of Economics, Stellenbosch University.

Calitz, E., Siebrits, K. and Stuart, I., 2016, "Enhancing the accuracy of fiscal projections in South Africa", *South African Journal of Economic and Management 19(3),* 330-343, Pretoria.

Central Bank of Lesotho, 2001, "Blueprint for New Instrument of Monetary Policy", Central Bank of Lesotho, Maseru.

Chipote, P. and Makhetha, P. 2014, "The impacts of monetary policy on economic growth: A case study of South Africa", *Mediterranean Journal of social sciences 5(15).*

Chiriparihura, B. and Chifamba, R., 2015, "The impact of Namibia's Income Tax Reform", AGRODEP Working Paper no. 0020, IFPRI.

Cinar, M., Lihan, E. and Baki, D., 2014, "Examining the role of budget deficit policies on economic growth from a Keynesian perspective", *International Journal of Economics and Finance 6*.

Clarida, R. and Gertler, M., 1997, "How the Bundes bank conducts monetary policy in reducing inflation: Motivation and Strategy", University of Chicago Press, Chicago.

Daly, H., 2015, "Co-ordination of monetary and fiscal policies in France: An Empirical Overview", *International Journal of Economics, Commerce and Management 3(1),*1-20, United Kingdom.

Datta., K. and Mukhopadhyay, C.K., 2011, "Relationship between inflation and Economic Growth in South Africa: An economic view", International Conference on Economics and Finance Research, IPEDR Vol.4, IACSIT Press, Singapore.

De Castro Fernandez, F. and Hernandez De Cos, P., 2006, "The economic effects of exogenous fiscal shocks in Spain: A SVAR Approach", ECB Working Paper no. 647.

De Hoyos, R.E and Sarafidis, V., 2006, "Testing for cross sectional dependence in panel data models", *The STATA Journal 6(4)*, 482-496.

Dele, B. E. 2007, "Monetary policy and economic performance of West African Monetary Zone Countries", University of Lagos, Nigeria. [Online]. Available http://mpra.ub.uni-muenchen.de/4308/. Accessed 09/04/2018.

Dickey, D.A. and Fuller, W.A., 1979, "Distribution of the Estimators for Autoregressive Time Series with a Unit Root", *Journal of American Statistical Association 74(1)*, 427-431.

Dickey, D.A. and Fuller, W.A., 1981, "The Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root", *Journal of Econometrica 49*, 1057-1072.

Dlamini, B.P., 2018, "An assessment of the impact of fiscal policy on output in Swaziland: A determination of the size of fiscal multipliers in recessions and expansions", Research Bulletin vol.2, 24-43, Central Bank of Swaziland.

Dlamini, M.P. and Kunene, C.J.M., 2008, "The Swaziland Administration Reform Experience", 30th AAPAM Annual Round Table Conference, African Association for Public Administration and Management, Acera, Ghana, 6-10 October.

Dlamini, S.S., Dlamini, N.S and Kunene, S., 2018, "The efficacy and potency or paralysis of monetary policy in Swaziland under the Common Monetary Union", Research Bulletin vol.2, 44-59, Central Bank of Swaziland.

Du Plessis, S., Smitt, B., and Sturzenegger, F. 2007, "The cyclicality of monetary and fiscal policies in South Africa since 1994".

Eberhardt, M. and Teal, F., 2011, "Econometrics for Grumblers: A new look at the literature on cross country growth empirics", *Journal of Economic Survey 25(1),* 109-155.

Eichenbaum M. and Evans C. 1995, "Some empirical evidence on the effects of shocks to monetary policy on exchange rates", *Quarterly Journal of Economics 110(4),* 975-1009.

Engle, R.F. and Granger, C.W.J., 1987, "Cointegration and error correction: Representation, estimation and testing", *Journal of Econometrica 55,* 251-276.

Fatima, G., Ather, A. and Wali, R., 2011, "Fiscal deficits and Economic Growth: An empirical Analysis of Pakistan's Economy", *International Journal of Trade, Economics and Finance 2*.

Favara, G., 2003, "An Empirical Reassessment of the Relationship between finance and Growth", IMF Working paper no. 03/123.

Fernald, J.G., Spiegel, M.M. and Swanson, E.T., 2014, "Monetary policy effectiveness in China: Evidence for FAVAR model", *Journal of International Money and Finance 49,* 83-103.

Fourie, F.C. and Burger, P. 2003, "Fiscal sustainability and the South African transformation challenge", *African Journal of Economics* 71(4), Dec, 806-829.

Fourie, F.C.V.N. and Burger, P., 2011, How To Think And Reason In Macroeconomics,3rd Edition, Juta Publishers, South Africa.

Frimpong, J.M. and Oteng-Abayie, E.F., 2010, "When is inflation harmful? Estimating the Threshold Effect for Ghana", *American Journal for Economics and Business Administration 2(3)*, 232-239.

Galebotswe, O. and Tlhalefang, J.B., 2012, "Monetary Policy Shocks and Stock Returns Reaction: Evidence from Botswana", University of Botswana.

Galebotswe, O., 2012, "Macroeconomic fluctuations in Botswana", *Botswana Journal of African Studies 26(1)*, 9-23.

Gidlow, R.M., 1995, "Monetary policies under Dr Gerhard De Kock:1981 to 1989", South African Reserve Bank.

Giordano, R., Momigliano, S., Neri, S. and Perotti, R., 2007, "The effects of fiscal policy in Italy: Evidence from a VAR model", *European Journal of Political Economy 23*, 707-733.

Goamab II, M., 1998, "Modelling inflation in Namibia", Occasional paper no. 1, Bank of Namibia.

Government of Lesotho, 1997, "Economic options for Lesotho", Ministry of Economic Planning, Maseru.

Granger, C.W.J., 1981, "Some properties of time series data and their use in econometric model specification", *Journal of Econometrics 55*, 121-130.

Granger, C.W.J., 1990, "Aggregation of time series variables: A survey", In T, Barker and M.H. Pesaran, eds., Disaggregation in Econometric Modelling, Routledge, London.

Griliches, Z. and Hausman, J.A., 1986, "Errors in variables in panel data", *Journal of Econometrics 31*, 93-118.

Griliches, Z., 1967, "Distributed Lags: A Survey", *Journal of Econometrica 35*,16-49.

Griliches, Z., 1984, "Patent Statistics as Economic Indicators: An American Survey", *Journal of Economic Review 84*, 1-23.

Gujarati, D., 2004. *Basic Econometrics*. India, McGraw-Hill Education.

Hassan, M., Raja, N. and Chang, L., 2014, "Effect of government deficit spending on the GDP in the United States", *Journal of Economics and Economic Education Research 15*, 103-112.

Heppke-Falk, K.H., Tenhofen, J. and Wolff, G.B., 2006, "The macroeconomic effects of exogenous fiscal policy shocks in Germany: A disaggregated SVAR analysis", Deutsche Bundesbank, Discussion paper no. 41.

Hermans, H.C.L., 1996, "The History of the Bank of Botswana", *The Research Bulletin: Special Edition* 14(2), Research Department, Bank of Botswana.

Hlongwane, T.M., Mongale, I.P. and Tala, L., 2018, "Analysis of the impact of fiscal policy on economic growth in South Africa: VECM Approach", *Journal of Economics and Behavioral Studies 10(2)*,231-238, May.

Honde, J. and Fitsum, G., 2015, "Botswana economic performance between 1990 and 2014", African Development Bank.

Hsiao, C., Appelbe, T.W. and Dineen, C.R., 1993, "A general framework for panel data analysis with application to Canadian customer dialled long distance service", *Journal of Econometrics 59*, 63-86.

Hsiao, C., Mountain, D.C. and Ho-Lilaman, K., 1995, "Bayesian Integration of end-user metering and conditional demand analysis", *Journal of Business and Economic Statistics 13*, 315-326.

Hsiao, C., Peresan, M.H. and Fujiki, H., 2005, "Aggregate vs Disaggregate data analysis: A paradox in the estimation of money demand function of Japan under the low interest rate policy", *Journal of Applied Econometrics 20*, 579-601.

Idustrial Development Corporation (IDC), 2013, "An Overview of Key Trends Since 1994".

Ikhide, S. and Uanguta, E., 2010, "Impact of South Africa's monetary policy on LNS economies", *Journal of Economic Integration 25(2)*, June, 324-352.

Im, K. S., Peresan, M. H., & Shin, Y. 2003, "Testing for unit roots in heterogeneous panels", *Journal of econometrics 115*(1), 53-74.

International Monetary Forum (IMF), (2016), "Press Release; Staff Report; and Statement by Executive Director for Botswana", IMF Country Report No. 16/103, April.

Jooste, C., Liu, G. and Naraidoo, R., 2012, "Analyzing the effects of fiscal policy shocks in the South African economy", University of Pretoria Working Paper Series, No. 2012-06.

Jordaan, C.A. and Eita, J.H., 2007, "Export and Economic Growth in Namibia: Granger Causality Analysis".

Kao, C., 1999, "Spurious regression and residual based tests for cointegration in panel data", *Journal of Econometrics 90,* 1-44.

Khamfula, Y., 2004, "Macroeconomic policies, shocks and economic growth in South Africa", A paper presented at the macroeconomic policy challenges in low income countries conference, IMF Headquarters Washington, DC, February 15-16 2005.

Khoitsiwe, K., 2018, "The Impact of Mining Sector on Economic Development in Botswana", Department of Geosciences, Geotechnology, and Materials Engineering for Resources, Graduate School of Engineering and Resource Science, Akita University.

Kunene, S. and Mdladla, T., 2018, "The impact of monetary policy changes on macroeconomic variables in Swaziland: A special focus on fiscal variables", Research Bulletin vol.2, 60-70, Central Bank of Swaziland.

Langa, T., 2001, "Monetary Policy in Swaziland", *a paper prepared for the conference on monetary policy frameworks in Africa,* Pretoria, South Africa, 17–19 September.

Leshro, T.L.A., 2017, "An empirical Analysis of Disaggregated Government Expenditure and Economic Growth in South Africa", UNISA Economic Research Working Paper Series, Working Paper No:10/2017, Department of Economics, University of South Africa.

Levin, A., Lin, C. F., and Chu, C. S. J., 2002," Unit root tests in panel data: asymptotic and finite-sample properties", *Journal of Econometrics 108(1),* 1-24.

Lewbel, A., 1994, "Aggregation and simple dynamics", *Journal of American Economic Review 84,* 905-918.

Lewen, M., 2011, “Botswana’s success: Good governance, good policies and good luck”.

MaCurdy, T.E., 1981, “An empirical model of labour supply in a life cycle setting”, *Journal of Political Economy 81*, 1059-1085.

Mansouri, B. 2008, “Fiscal Policy and Economic Growth: Egypt, Morocco and Tunisia Compared. Proceeding in UNECA Conference on: Macroeconomic Policy, Productive Capacity and Economic Growth in Africa”, Addis Ababa, 23-25 Nov.

Maope, K., 2003, “Budget Speech 2002/2003”, Ministry of Finance and Development Planning, Maseru.

Masalila, K. S., and Phetwe, M., 2001, “Botswana’s Monetary Policy Framework”, *a Paper prepared for the Conference on Monetary Policy Frameworks in Africa,* Pretoria, South Africa, 17-19 September.

Matemilola, B.T., Bany-Ariffin, A. N. and Muhtar, F.E., 2014, “The impact of monetary policy on bank lending rate in South Africa”, *Borsa Istanbul Review Journal 15(1)*, 53-59, Malaysia.

Mboji, L., 2017, “Impact of the tax burden on long run economic growth: A BRICS perspective”, The Graduate School of Business, University of Cape Town.

Mbulawa, S. and Chingoiro, S., 2017, “A test for non-linearity between fiscal policy and economic growth performance in Botswana: An Autoregressive Distributed Lags (ARDL) Approach”, *European Journal of Economics and Management Sciences 17(2)*, 88-101.

Modisaemang, G., Narayana, N. and Sukumaran Nair, M.K., 2015, “Is External Debt A Threat to Botswana’s Economic Growth?: An Empirical Enquiry”, *International Journal of Economic Issues 8(1)*, 15-23.

Mohammed, E.H. and Mahfuzul, H., 2017, “Fiscal deficit and its impact on Economic Growth”, MDPI.

Mohanty, R.K., 2012, “Fiscal Deficit-Economic Growth Nexus in India: A cointegration Analysis”, PhD Dissertation, Centre foe Economic Studies and Planning, School of Social Sciences, Jawaharlal Nehru University, New Delhi, India.

Mohohlo, L. K., 2008, "Monetary Policy Statement", Bank of Botswana, [Online]. Available: http://www.bankofbotswana.bw. Accessed 10/04/2018.

Molopo, S.S., 2015, "Analysis of public expenditure growth in infrastructure in Lesotho", Fiscal policy and financial programming, MEFMI.

Mosikari, T.J. and Eita, J.H., 2017, "Empirical test of the Ricardian Equivalence in the Kingdom of Lesotho", *Journal of Cogent Economics and Finance 5(1),* 1-11.

Motlaleng, R., Nangula, P. and Moffat, B., 2011, "Effectiveness of fiscal spending in the presence of persistent budget deficit in Namibia: Crowding out or Crowding in", *Journal of International Economic Research 2(1),* 96 – 117.

Mthethwa, N.R., 1998, "Government Expenditure Growth in South Africa 1960-1993", Department of Economics, University of Natal.

Mujuta, S.C., 2013, "The effectiveness of fiscal deficits in stimulating economic growth", Department of Economics, University of the Western Cape.

Munongo, S., 2012, "Effectiveness of fiscal policy in economic growth: The case of Zimbabwe", *International Journal of Economic Research 3i6,* 93-99.

Munyengwa, T., 2012, "Monetary policy transmission mechanism in Botswana: How does the central bank policy rate affect the economy?", University of the Western Cape, South Africa.

Muyambiri, B. and Odhiambo, N.M., 2017, "The impact of financial development on investment in Botswana: An ARDL-Bounds testing Approach", *Journal of International Economics 70(2),* 193-216.

Nakale, S., 2015, "The Determinants of Economic Growth in Namibia", National Planning Comission, Office of the President, Replublic of Namibia.

National Treasury., 2018, 2018 Budget Review, Accessed from www.treasury.gov.za on 14/04/2018.

Navaratnam, R., and Mayandy, K., 2016, "Causal Nexus Between Fiscal Deficit and Economic Growth: Empirical Evidence from South Asia", *International Journal for Innovation Education and Research 8*, 1-19.

Ndzinisa, P. and Sithole, M.V., 2018, "Determination of an optimal Public Debt Threshold Level for Economic Growth in Swaziland", Research Bulletin vol.2, 4-15, Central Bank of Swaziland.

Ndzinisa, P., 2008, "The efficacy of monetary policy on economic growth in Swaziland", The central bank of Swaziland, Research department.

Nemaorani, T., 2012, "Impact of monetary policy on stock prices: Evidence from Botswana, University of Botswana.

Nerlove, M., 2002, "Essays in Panel Data Econometrics", Cambridge University Press, Cambridge.

Nkhalamo, J.C. and Sheefeni, J.P.S., 2017, "Tax and Economic Growth in Namibia", *European Journal of Business, Economics and Accountancy 5(2)*, ISSN 2056-6018.

Noman, S. and Khudri, M. 2015, "The effects of monetary and fiscal policies on economic growth in Bangladesh", *ELK Assia Pacific Journal of finance and risk management 6(3),* 21-34

Ntshakala, P., 2014, "Effects of public debt on economic growth in Swaziland", *International Journal of Business and Commerce 5(1)*.

Nxumalo, W.N. and Hlophe, N.F., 2018, "Assessing fiscal sustainability in Swaziland", *South African Journal of Economic and Management Sciences 21(1)*, a1821.

Ocran, K., 2009, "Fiscal Policy and Economic Growth in South Africa", A paper presented at the Centre for the Study of African Economies "Conference on Economic Development in Africa", St. Catherine's College, Oxford University, UK, March 22-24.

Ocran, K., 2011, "Fiscal policy and economic growth in South Africa", *Journal of Economic Studies 38(5)*, 604-618.

Odada, T.E. and Eita, J.H., 2010, "Causes of inflation in Namibia: An empirical exposition", *The African Financial Journal 12*, 44-57.

Odhiambo, S., Momanyi, G., Othuon, L. and Fredrick, O.A., 2013, "The relationship between fiscal deficits and Economic Growth in Kenya: An Empirical Investigation", *Greener Journal of Social Sciences 3,* 306-323.

Olatunji, G.B., Omotesho, O.A., Ayinde, O.E. and Ayinde, K., 2010, "Determinants of inflation in Nigeria: A Cointegration Approach", Contribution paper presented at the 3rd Africa Association of Agricultural Economists (AAAE) and 8th Agricultural Economists Association of South Africa (AEASA) conference, Cape Town, 19-23 September.

Oteng-Abayie, E.F. and Doe, S.K., 2013, "Inflation and Inflation Uncertainty in Ghana", *Journal of Business Management and Economics 4(12),* 259-266, December.

Pedroni, P., 1999, "Critical values for cointegration tests in heterogeneous panels with multiple regressors", Oxford Bulletin of Economics and Statistics 61, 653-670.

Peresan, H. and Shin, Y., 1999, "An Autoregressive Distributed Lag Modelling Approach to Cointegration in Econometrics Economic Theory in the 20th Century", The Raguar Frisch Centennial Symposium Cambridge University Press, Chapter 4, 371-413.

Peresan, H. and Smith, R., 1995, "Estimating Long Run Relationships from Dynamic Heterogeneous Panel", *Journal of Econometrics 68(1),* 79-113.

Peresan, H., Shin, Y. and Smith, R.P., 1999, "Pooled Mean Group Estimation of Dynamic Heterogeneous Panels", *Journal of the American Statistical Association 94(446),* 621-634.

Peresan, M.H., 2003, "On aggregation of linear dynamic models: An application to life cycle consumption models under habit formation", *Journal of Economic Modelling 20,* 227-435.

Peresan, M.H., Shin, Y. and Smith, R.J., 2001, "Bound testing approaches to the analysis of level relationships", *Journal of Applied Econometrics 16(3),* 289-326.

Pesaran, H.M., Ullah, A. and Yamagata, T., 2008, "A bias-adjusted LM test of error cross section independence", *Econometrics Journal 11,* 105-127.

Phillips, P. and Sul, D., 2003, "Dynamic panel estimation and homogeneity testing under cross section dependence", *Journal for Econometrics 6,* 217-259.

Phillips, P.C.B. and Durlauf, S.N., 1986, "Multiple time series regression with integrated process", *Journal of Economic Studies Review 53*, 473-495.

Phillips, P.C.B. and Moon, H.R., 1999, "Linear regression limit theory for nonstationary panel data", *Journal of Econometrica 67*, 1057-1111.

Poulson, B.W. and Kaplan, J.G., 2008, "State income taxes and Economic Growth", *Cato Journal 28*, 53-71.

Precious, C., 2014, "Impact of monetary policy on Economic growth: A case study of South Africa", *Mediterranean Journal of Social Sciences*.

Price Water House Coopers, 2008, "Namibia Budget Review 2007/2008: What is fiscal policy?". Retrieved on 13/07/2018, from http://www.investopedia.com/articles/04/051904.asp

Rafiq, M.S and Mallick, S.K., 2008, "The effect of monetary policy on output in EMU3: A sign restriction approach", *Journal of Macroeconomics 30*, 1756–1791. [Online] Available: www.sciencedirect.com. Accessed 10/04/2018.

Reade, J.J. and Sthe, J., 2008, "The interaction of fiscal and monetary policy and its impact on economic growth in the United States", Discussion Paper, Department of Economics, University of Birmingham, January.

Ricardo, M. and Ferdmanesh, M., 2007, "Fiscal variables and Growth: A cross sectional analysis", *The Journal of Public Choice 64*.

SACU, 2017, Annual Report, [Online].Accessed 04/07/2018, Available: www.sacu.com

Sekantsi, L.P. and Kalebe, K.M., 2015, "Savings, investment and economic growth in Lesotho: An empirical analysis", *Journal of Economics and International Finance 7(10)*, 213-221.

Seleteng, M., 2006, "Inflation and Economic Growth: An estimate of an optimal level of inflation in Lesotho", Research Department, Central Bank of Lesotho.

Seleteng, M., 2014, "Effects of South African monetary policy implementation on the CMA: A panel VAR approach", working paper no. 021/14, Central bank of Lesotho.

Seleteng, M., Damane, M., and Hlaahla, M., 2017, "The effects of fiscal policy shocks on a selected group of macroeconomic variables in Lesotho: Evidence from SVAR model".

Setlhare, L., 2004, "Bank of Botswana's Reaction Function: Modeling Botswana's Monetary Policy Strategy". *South African Journal of Economics 72.*

Shafuda, C.P.P., 2015, "An Examination of the Relationship Between Government Spending and Economic growth in Namibia", A thesis submitted for master's degree, Business Administration (Finance), University of Namibia.

Sheefeni, J.P., 2013, "Monetary Policy in Namibia, 1993-2011", Thesis submitted in fulfilment of the requirements for the degree of Doctor Philosophy of Commerce, Faculty of Business and Economic Sciences, Nelson Mandela Metropolitan University, South Africa.

Shim, J., 2003, "Dictionary of economics: Revised edition, United States of America".

Sims, C. A., 1992, "Interpreting the Macroeconomic Time Series Facts: The Effects of Monetary Policy", *European Economic Review 36 (5)*, 975-1000.

Sindanu, A., 2014, "Inflation and Economic growth: An estimate of optimal level of inflation in Namibia", Namibia Business School.

Sola, O. and Peter, A., 2013, "Money supply and inflation in Nigeria: Implication for national development", [Electronic Version]. Scientific Research, 4, 161-170.

Sousa, J. and Zaghini, A., 2008, "Monetary policy shocks in the euro area and global liquidity spillovers", *International journal of finance & Economics 3(3),* 205-218.

Stals, C., 1995, "Monetary Policy in South Africa", Address to the second South African economy, investment and trade conference, London, October 17.

Stals, C., 1997, "Effect of the changing financial environment on monetary policy in South Africa", Address to the annual dinner of the economic society of South Africa, Pretoria Branch, May 15.

Stals, C., 1999, "Statement on Reserve Bank accommodation procedures", Quarterly Bulletin, South African Reserve Bank, Pretoria, June 23.

Starr, M. A., 2005, "Does money matter in the CIS? Effects of monetary policy on output and prices", *Journal of Comparative Economics*, 441-461. [Online] Available: www.sciencedirect.com. Accessed 10/04/2018.

Stock, J. H. and Watson, M. W., 2012, "Introduction to Econometrics", 4th Edition, Addison Wesley Upper Saddle River, NJ.

Sukurumaran Nair, M.K., 2016, "Macroeconomic determinants of economic diversification in Botswana", Proceedings of International Academic Conference 3606140, International Institute of Social and Economic Sciences.

Svensson, L., Hong, K., Berg, A., Solheim, H. and Steigum, E., 2002, "An independent review of monetary policy and institutions in Norway", Norges Bank Watch, Centre for monetary economics, BI Norwegian School of Management.

Taye, H., 2011, "Botswana's Debt Sustainability: Tracking the path", BIDPA Working Paper no.28, Botswana Institute for Development Policy Analysis.

Thabane, K. and Lebina, S., 2012, "Economic growth and government spending nexus: Empirical Evidence from Lesotho", *African Journal of Economic Review 4(1)*, 86-101.

Thabane, K. and Lebina, S., 2016, "Economic Growth and Government Spending Nexus: An Empirical Evidence from Lesotho", *Journal of Economic Review 4(1)*, 86-100.

Thamae, M., 2014, "Excess liquidity in financial sector of Lesotho: Main drivers and policy options", Wits Business School, Wits University.

Thamae, R.I. and Kolobe, L.G., 2016, "The fiscal effects of foreign aid in Lesotho", *Mediterranean Journal of Social Sciences 7(1)*, 122-166.

Thamae, R.I. and Letsoela, M.L., 2014, "Food inflation in Lesotho: Implications for monetary policy", *Journal of African Review of Economics and Finance 6(1)*, 56-68.

Thamae, R.I. and Macheli, M.V., 2013, "The effects of public spending on private consumption in Lesotho", *African Journal of Business and Economic Research 8*, 25-37.

Thamae, R.I., 2011, "The Growth of Government Spending in Lesotho", Department of Economics, National University of Lesotho, Maseru, Lesotho.

Thamae, R.I., 2013, "The growth of government spending in Lesotho", *Journal of Economic analysis and Policy 43(3),* 339-352.

Umaru, A., Hamidu, A. A., and Musa, S., 2013, "External Debt and Domestic Debt Impact on the growth of the Nigeian Economy", *International Journal of Educational Research,* 70-86.

Undji, V.J. and Kaulihowa, T., 2015, "Determinants of Inflation in Namibia: A cointegration Approach", *Journal of Business and Management Dynamics 5(1),* 1-6.

Van Der Merwe, E., 2004, "Inflation targeting in South Africa", Occasional Paper no. 19, South African Reserve Bank, July.

Wansbeek, T.J. and Koming, R.H., 1989, "Measurement error and panel data", *Journal of Statistica Neerlandica 45*, 85-92.

Wegner, T., 2007, Applied Business Statistics-Methods and Excel-based Application, second Edition, Juta Legal and Academic Publishers, South Africa.

William, L., 2011, "Social Research Methods".

Wooldridge, J. M., 2009, "Econometric Analysis of Cross-Section and Panel Data", MIT Press, Massachusetts.

Worlu, C.N. and Emeka, N., 2012, "Tax revenue and economic growth in Nigeria", *Academic Journal for Interdisciplinary Studies 1*, 211-222.

Yi, F. and Sunyono, E., 2014, "The relationship between tax revenue and economic growth of Hebiei province based on the tax multiplier effect", *Global Economy and Finance Journal 7*, 1-18.

Zaaruka, B. P., 2007, "Public Debt and Economic Growth in Namibia: The threshold effect", MEFMI fellow on Debt Management Programme.

Zaaruka, B., Biwa, B. and Kalenga, P., 2001, "Public expenditure management in Namibia Health and Education sectors", Bank of Namibia Working Paper no. 1/02.

Zaaruka, B., Ndove, T. and Tjipe, T., 2004, "Central Government Debt Sustainability in Namibia", Bank of Namibia Working Paper, Windhoek, Namibia.

APPENDICES

APPENDIX 1: DATA

- **SOUTH AFRICA**

YEAR	RGDP	GEXP	GREV	PINV	ER	INR	INF	M2
1980	6.620585	12.96806	19.9267	-1E+07	0.778834	-12.315	14.2	52.08934
1981	5.360737	13.68928	19.5447	65000000	0.877579	3.510318	15.3	52.61318
1982	-0.38339	15.3782	19.888	3.3E+08	1.085816	4.692194	14.4	52.59521
1983	-1.84654	15.07855	19.8198	70900000	1.1141	0.123949	12.5	52.34542
1984	5.099115	16.77768	19.9848	4.2E+08	1.475277	9.738082	11.3	53.52617
1985	-1.21148	17.0874	21.9439	-4.5E+08	2.228675	4.010452	16.4	53.16485
1986	0.017835	17.52426	22.0891	-5E+07	2.285032	-2.40626	18.4	49.36318
1987	2.100735	18.29942	21.6437	-1.9E+08	2.036033	-1.7287	16.2	50.47785
1988	4.200133	17.78391	20.5617	1.58E+08	2.273468	0.159846	12.9	53.43538
1989	2.394784	17.73677	21.2972	-2E+08	2.622678	2.225483	14.8	53.67478
1990	-0.31779	18.56133	24.8778	-7.6E+07	2.587321	4.782658	14.2	52.15655
1991	-1.01822	18.65856	22.9532	2.54E+08	2.761315	4.029848	15.2	53.35797
1992	-2.13706	18.96576	22.7282	3358018	2.852014	3.786464	14.1	48.95198
1993	1.23352	19.64118	20.557	11290546	3.267742	2.81176	9.7	45.50002
1994	3.234143	19.79856	23.2307	3.74E+08	3.550798	5.531638	8.8	47.61231
1995	3.115634	18.11765	22.8061	1.25E+09	3.627085	6.986659	8.8	48.61848
1996	4.306728	19.14527	23.95	8.16E+08	4.299349	10.77132	7.4	49.36725
1997	2.646829	19.29195	23.7703	3.81E+09	4.607962	11.17491	8.6	52.49439
1998	0.51736	18.91177	24.5143	5.5E+08	5.528284	13.01244	7	55.07585

1999	2.358108	18.58083	24.4567	1.5E+09	6.109484	10.20626	5.1	55.73438
2000	4.154545	18.38694	24.2841	9.69E+08	6.939828	5.196634	5.4	52.7105
2001	2.735495	18.53406	24.6957	7.27E+09	8.609181	5.730392	5.6	57.30775
2002	3.667797	18.80519	24.6963	1.48E+09	10.54075	3.126719	9.1	58.25776
2003	2.949078	19.05789	24.6312	7.83E+08	7.564749	8.662872	5.9	60.63115
2004	4.55457	19.15756	25.294	7.01E+08	6.459693	4.472723	1.4	61.59694
2005	5.277112	19.47819	26.8434	6.52E+09	6.359328	4.908487	3.4	66.97005
2006	5.603665	18.15353	27.7336	6.23E+08	6.771549	4.622151	4.6	73.1851
2007	5.360465	17.81401	29.5681	6.59E+09	7.045365	3.966265	7.2	79.08595
2008	3.191052	18.65793	29.6812	9.89E+09	8.261223	5.782789	11	80.79989
2009	-1.5381	19.86448	27.7885	7.62E+09	8.473674	3.910347	7.1	77.67791
2010	3.039777	20.22964	27.8486	3.69E+09	7.321222	3.2744	4.3	75.79962
2011	3.284197	19.86223	27.5104	4.14E+09	7.261132	2.316472	5	74.63563
2012	2.213259	20.25993	31.5855	4.63E+09	8.209969	3.293181	5.6	72.94244
2013	2.489283	20.57498	31.8506	8.23E+09	9.655056	2.21823	5.8	71.01361
2014	1.699598	20.79568	32.1282	5.79E+09	10.85266	3.171799	6.1	70.87028
2015	1.298851	20.46034	32.4013	1.52E+09	12.75893	4.212258	4.6	73.43786
2016	0.279357	20.80686	32.6707	2.22E+09	14.70961	3.221193	6.3	72.55009
2017	1.320061	20.93433	32.9434	3.12E+09	13.33378	4.326591	5.3	72.20792

- **LESOTHO**

YEAR	RGDP	GEXP	GREV	PINV	ER	INR	INF	M2
1980	-2.74478	24.89251	27.12328	4493899	0.778834	-21.5323	19.6	35.2886

1981	0.694638	35.23152	29.12345	4786170	0.877579	2.1522	11.9	39.09029
1982	4.457204	40.04532	30.67223	3039189	1.085816	22.96716	14.4	50.33521
1983	1.986165	37.1507	32.60819	4802082	1.1141	3.459963	15.1	52.13038
1984	5.534898	36.3949	35.28255	2311430	1.475277	8.769773	11.6	52.53559
1985	2.610249	43.90013	37.92496	0	2.228675	0.807771	15	52.49238
1986	4.684856	44.83734	37.81627	2061134	2.285032	-2.44002	15.7	49.17337
1987	0.729728	54.24494	41.42877	5673030	2.036033	-0.54663	12	48.24989
1988	8.601919	47.28096	36.79808	21028262	2.273468	-5.34175	12.4	46.84206
1989	5.795244	47.33917	43.12177	13370284	2.622678	3.405382	14.7	43.98351
1990	6.045473	43.70523	45.48776	17080426	2.587321	7.520733	12	40.64073
1991	6.966607	42.15325	45.41873	7467682	2.761315	1.844037	17.3	35.54654
1992	6.956365	39.53479	45.32237	2667302	2.852014	3.783613	18.1	32.25624
1993	3.509766	39.41183	47.84875	14977905	3.267742	4.07497	10.7	34.24957
1994	5.979874	39.72162	48.37684	18735210	3.550798	6.016114	8.3	33.25348
1995	3.290939	40.99921	49.40603	2.75E+08	3.627085	3.15422	9.7	31.33621
1996	5.597035	43.31491	51.60317	2.87E+08	4.299349	11.04346	8.9	32.79573
1997	3.703604	44.92029	51.31446	2.68E+08	4.607962	8.268648	8.4	33.2915
1998	1.537656	43.8524	46.06234	2.65E+08	5.528284	9.224946	8.2	34.46142
1999	0.476025	52.16875	43.56689	1.63E+08	6.109484	10.10924	7.8	30.08733
2000	3.875547	44.75429	43.61813	32403928	6.939828	10.17067	6.1	27.62254
2001	3.561582	48.29607	45.00105	29695246	8.609181	4.558153	8	28.03242
2002	0.723836	49.2125	46.30828	28391255	10.54075	2.541936	12.2	26.5147
2003	4.559777	47.7207	48.84608	43948140	7.564749	13.25297	6.3	26.23518

2004	1.692374	45.5523	53.1750 2	5567143 1	6.459693	2.531567	4.6	24.33468
2005	3.466123	48.8292 6	53.2848 9	2744144 9	6.359328	5.469853	3.6	24.23285
2006	4.230095	51.7103 7	66.0382 8	2432228 7	6.771549	2.607098	6.3	28.77828
2007	4.832963	52.0093 3	63.1514 5	7561600 2	7.045365	13.6884 4	9.2	31.81594
2008	6.739534	58.1337 8	67.0445	1100997 3	8.261223	2.943907	10.7	31.59975
2009	2.154308	67.6708 2	63.7019	9134955 3	8.473674	12.8266 2	5.8	33.27227
2010	6.072039	57.7372 8	52.7646 9	9507301	7.321222	6.788861	3.3	36.8536
2011	6.901334	63.1004 2	62.9124	6117331 9	7.261132	1.861929	6	32.99775
2012	5.998072	70.0525	63.7367	5665343 5	8.209969	7.454767	5.5	32.5088
2013	1.843045	71.8181	64.561	5042903 1	9.655056	0.936992	5	35.51461
2014	3.121722	72.3484	65.3852	9445905 9	10.8526 6	-2.20083	4.6	31.73147
2015	2.516588	73.1136	66.2095	1.13E+0 8	12.7589 3	0.618116	4.3	31.69789
2016	2.397154	73.8788	67.0338	8043406 0	14.7096 1	8.379127	6.2	28.61402
2017	5.590877	74.644	67.8581	9002325 6	13.3337 8	9.215241	5.6	34.39881

- **SWAZILAND**

YEAR	RGDP	GEXP	GREV	PINV	ER	INR	INF	M2
1980	12.44905	27.0331	15.92154	26451290	0.778834	1.192559	18.2	31.67516
1981	14.64144	26.7119 2	16.01757	37081690	0.877579	7.477181	20.1	28.21262
1982	1.172568	24.1562 4	16.7993 3	-1.4E+07	1.085816	1.905991	10.8	27.64845
1983	1.202355	21.5766 9	16.23544	-5654789	1.1141	11.23107	11.6	32.02554
1984	6.161755	20.6158 3	16.83687	5016005	1.475277	8.344996	12.9	32.71679
1985	3.792416	20.7679 1	17.3049	11651363	2.228675	3.253694	20.5	36.54355

1986	12.26448	20.06455	16.32056	31115543	2.285032	0.32122	13.7	31.75485
1987	14.60659	19.42508	17.47646	56285915	2.036033	10.63682	13.4	31.2578
1988	6.569822	17.54545	19.67179	50583525	2.273468	-8.84882	20.4	32.41747
1989	12.9111	17.43421	22.376	67183251	2.622678	11.27878	7.5	35.06488
1990	21.018	14.29576	24.46011	30108365	2.587321	-12.1831	13.1	22.35534
1991	1.760376	14.86943	24.5733	82134780	2.761315	6.654777	8.9	24.25378
1992	3.226207	13.37553	23.25947	87306719	2.852014	4.25637	7.6	25.61454
1993	3.106114	17.61014	21.348	71920620	3.267742	-2.59301	12	24.03333
1994	2.400691	17.34255	21.53181	63262111	3.550798	2.955358	13.8	23.44943
1995	4.825652	15.43235	22.16576	51756162	3.627085	0.347011	12.3	19.91804
1996	3.842054	17.20859	23.32573	21715845	4.299349	10.20065	6.4	20.72218
1997	3.102805	20.72169	24.53551	-1.5E+07	4.607962	7.324236	7.1	21.55404
1998	2.604039	20.65821	25.50804	1.53E+08	5.528284	11.26083	8.1	22.07631
1999	2.950875	19.71386	26.84037	98270490	6.109484	11.43267	6.1	23.53122
2000	1.760174	14.45393	26.34739	90658006	6.939828	-9.04953	12.2	17.22985
2001	1.054765	14.64794	26.75064	29330084	8.609181	3.953807	5.9	17.17325
2002	4.380099	13.17693	26.69625	92945313	10.54075	5.816532	12	17.10612
2003	3.880214	15.36338	27.88583	-6E+07	7.564749	8.131186	7.3	17.77776
2004	3.623914	17.94669	32.13594	69582012	6.459693	7.143821	3.4	17.6744
2005	5.998777	17.0759	33.2131	-4.6E+07	6.359328	3.817847	1.8	17.16873
2006	5.992167	17.17015	42.76649	1.21E+08	6.771549	6.848736	5.2	19.47422
2007	4.435376	17.7647	37.16015	37493846	7.045365	7.763104	8.1	21.56834
2008	0.821664	20.12963	40.40494	1.06E+08	8.261223	3.991609	12.7	22.35301

2009	1.565049	21.43612	36.07896	65705860	8.473674	1.462218	7.4	25.42316
2010	3.793755	20.8988	24.86358	1.36E+08	7.321222	6.34981	4.5	25.61063
2011	2.24723	19.33042	25.52212	98708322	7.261132	3.473535	6.1	25.07964
2012	4.718156	18.17734	21.3181	26480002	8.209969	0.649228	8.9	24.38623
2013	6.420805	18.3277	28.1715	81790158	9.655056	3.848936	5.6	25.42784
2014	1.93101	19.07156	34.2952	25782635	10.85266	2.631848	5.7	24.4996
2015	0.391129	20.47987	39.2952	31498094	12.75893	1.382335	5	25.77106
2016	1.368694	22.28668	50.398	27049950	14.70961	4.741806	8	30.52777
2017	2.000626	24.36951	46.8939	47988821	13.33378	5.023356	6.3	32.59668

- **BOTSWANA**

YEAR	RGDP	GEXP	GREV	PINV	ER	INR	INF	M2
1980	11.9869	21.33891	15.63017	1.12E+08	0.777225	-1.55665	12.1	28.72597
1981	9.064857	24.80801	16.44477	88438640	0.836738	9.72191	16.3	25.20846
1982	12.16553	26.05139	20.05957	21074901	1.029661	19.78189	11.2	23.5051
1983	13.14673	25.84672	28.6638	23793769	1.096926	4.257202	10.5	24.59463
1984	8.545384	25.01164	40.88282	62154696	1.298373	-2.96896	8.6	22.89749
1985	7.125271	22.98263	57.68399	53611788	1.902567	-9.27115	8.1	26.28068
1986	8.172924	23.96729	78.81272	70404391	1.879144	-2.68386	10	23.16367
1987	11.88193	26.8965	92.91551	1.14E+08	1.678941	-2.3906	9.8	30.71223
1988	19.44997	23.88953	30.13263	39921524	1.828588	-12.1142	8.4	25.40097
1989	13.05941	22.66418	40.06059	42186013	2.014886	-5.26368	11.6	28.92469
1990	6.772822	24.13664	90.46407	95889963	1.860466	1.481638	11.4	21.92021

1991	7.458709	24.22859	70.1634	-8211494	2.021557	6.327979	12.6	27.45639
1992	2.91707	26.35775	65.84545	-1564185	2.109725	6.902446	16.5	28.33217
1993	1.916107	27.99667	72.84067	-2.9E+08	2.423075	1.63797	14.4	21.03786
1994	3.627916	28.62365	77.7321	-1.4E+07	2.684646	4.067885	10.6	20.92185
1995	7.03041	30.05444	78.18649	70413221	2.772207	6.776494	10.5	20.47826
1996	5.8298	26.19377	76.49874	71182311	3.324197	-1.38848	10.1	19.79454
1997	8.026549	28.18232	42.60731	1E+08	3.650763	8.230435	8.9	22.38968
1998	0.721993	30.06916	39.90701	95318135	4.22588	3.636072	6.5	28.26306
1999	9.667241	27.41095	60.06754	36675066	4.624395	0.473256	7.8	28.50095
2000	1.987696	24.90273	71.63147	57171313	5.102244	1.145825	8.5	24.81621
2001	0.250574	23.48663	74.04834	30680474	5.841435	6.866384	6.6	39.39923
2002	6.069531	22.37913	72.96673	4.08E+08	6.327785	14.8447	8	45.24854
2003	4.625895	22.00872	77.63152	4.18E+08	4.949664	12.72616	9.2	47.87831
2004	2.705822	20.53234	70.23771	3.91E+08	4.693832	5.151957	7	46.88414
2005	4.556646	19.40075	69.65087	4.21E+08	5.116756	0.230181	8.6	44.42584
2006	8.363871	17.03785	66.23402	4.87E+08	5.830313	8.360417	11.6	41.56482
2007	8.276764	17.59478	34.6793	4.95E+08	6.139392	10.75731	7.1	48.09431
2008	6.245437	20.35126	31.06853	5.21E+08	6.826857	11.27885	12.6	52.49906
2009	-7.65231	21.08954	33.27506	2.09E+08	7.155138	6.850391	8.1	52.70287
2010	8.563632	19.75651	29.42874	2.18E+08	6.793608	2.330457	6.9	49.33968
2011	6.048316	18.09659	28.99783	1.37E+09	6.838232	-4.65131	8.5	41.74
2012	4.456167	18.94217	29.7497	5.43E+08	6.838232	11.12468	7.5	44.00227
2013	11.34342	18.54831	29.15068	3.98E+08	8.398926	9.688089	5.9	42.65785

2014	4.149253	19.93421	31.50927	5.15E+08	8.976087	-2.595	4.4	38.2826
2015	-1.69994	20.57752	37.84713	6.79E+08	10.129	6.074892	3.1	45.82943
2016	4.291562	18.14117	38.02131	10476236	10.90115	-3.76725	2.8	41.35672
2017	2.359197	15.21356	39.04528	11023256	10.34742	1.25653	3.3	40.23635
1980	0.61785	14.11593	27.62774	2000000	0.778834	2.4372	3.12	15.08459

- **NAMIBIA**

YEAR	RGDP	GEXP	GREV	PINV	ER	INR	INF	M2
1981	0.97145	20.64122	30.38207	1202222	0.877579	-2.9094	3.55	15.61873
1982	-0.39809	21.4988	32.06558	2130000	1.085816	-4.2721	17.01	16.01877
1983	-1.82345	22.10034	30.52902	120000	1.1141	-4.4794	13.35	16.71566
1984	-0.23689	22.20485	29.64079	2840000	1.475277	-4.8115	12.75	17.52786
1985	0.464171	21.85022	29.86149	110000	2.228675	-4.779	23.93	17.30851
1986	4.76727	22.94858	29.20121	140000	2.285032	-5.4413	10.03	13.36581
1987	3.553769	24.5259	31.10162	1150741	2.036033	-5.989	9.43	14.47248
1988	0.813149	23.28174	31.15069	860000	2.273468	-6.6633	20.17	17.43545
1989	1.858675	21.8741	31.19002	8290000	2.622678	-6.9379	15.1	19.67235
1990	2.04746	23.34998	28.46357	31350000	2.587321	-7.3149	13.7	20.36198
1991	8.165612	25.21733	32.1088	3300000	2.761315	16.38134	13.5	23.1399
1992	7.189343	26.53684	32.2569	-200000	2.852014	8.998077	21.6	28.68962
1993	-1.57954	26.03854	32.405	20000000	3.267742	8.619945	9.3	32.03505
1994	1.729879	23.603	32.5531	40000	3.550798	-3.01658	12.1	34.16115
1995	3.899014	25.05927	32.7012	710000	3.627085	11.18821	11.1	37.81658

1996	3.191324	25.04294	32.8493	-860000	4.299349	3.662156	8.7	39.55621
1997	4.2201	24.98371	32.9974	10000000	4.607962	12.37925	9.7	38.36206
1998	3.291586	24.51114	33.1455	20000	5.528284	11.43498	6.6	37.90007
1999	3.369279	25.07728	33.2936	4460000	6.109484	11.04477	9.4	41.06174
2000	3.492183	23.50385	33.4417	-4.1E+07	6.939828	2.619612	10.2	39.98176
2001	1.177949	22.82658	33.5898	1.03E+08	8.609181	2.941139	10.2	37.70814
2002	4.788661	21.48808	33.738	59055446	10.54075	2.807955	12.7	37.49118
2003	4.239794	22.20446	33.8861	1.16E+08	7.564749	13.55763	7.2	36.35373
2004	12.26955	20.3692	34.0342	27480196	6.459693	9.307952	4.1	38.93036
2005	2.529263	19.28449	34.1823	-6738759	6.359328	4.815108	2.3	37.82082
2006	7.073175	19.48249	34.3304	7.49E+08	6.771549	1.74602	5	41.91883
2007	6.617094	23.8619	34.4785	4.17E+08	7.045365	5.588998	6.5	42.71088
2008	2.649812	21.79636	34.6266	1.75E+09	8.261223	2.549995	9.1	42.50654
2009	0.295971	23.85852	34.7747	1.18E+09	8.473674	3.884938	9.5	63.23489
2010	6.039249	25.5541	34.9228	1.44E+09	7.321222	5.944006	4.9	62.60375
2011	5.091338	23.18895	35.0709	1.76E+09	7.261132	4.744408	5	64.04907
2012	5.061682	24.97058	35.219	2.68E+09	8.209969	-3.74728	6.7	57.23983
2013	5.61472	25.98867	35.3672	2.17E+09	9.655056	-0.46615	5.6	56.65426
2014	6.351678	26.24226	35.5153	1.76E+09	10.85266	2.297226	5.3	53.59191
2015	5.990761	25.61258	35.6634	1.23E+09	12.88192	8.91054	3.4	54.5643
2016	1.081512	24.23375	35.8115	1.5E+09	14.70877	1.796279	6.7	51.66934
2017	-0.77034	24.51227	35.9596	1.36E+09	13.3129	0.4488	6.1	53.39192

APPENDIX 2: DESCRIPTIVE STATISTICS FOR KEY VARIABLES

	RGDP	LGEXP	LGREV	LPINV	LINR	LINF	LER	LM2
Mean	4.182996	3.240630	3.560428	14.57833	1.106249	2.256741	1.703947	3.586828
Median	3.625915	3.129483	3.515699	17.93718	1.588751	2.266944	1.809844	3.567562
Maximum	21.01800	4.326038	4.542396	23.01428	3.176684	3.216072	2.754273	4.404276
Minimum	-7.652310	2.636774	2.811219	-19.93062	-3.114950	0.875469	0.575053	2.664851
Std. Dev.	3.839736	0.383584	0.396253	10.84401	1.482665	0.434448	0.594468	0.405209
Skewness	1.124782	1.179888	0.437898	-2.413388	-1.174218	-0.306715	-0.230430	-0.046396
Kurtosis	6.032320	3.707591	2.612876	7.323895	3.221230	2.902825	1.989015	2.202403
Jarque-Bera	112.8561	48.04807	7.258650	332.4512	44.04905	3.053764	9.772986	5.104447
Probability	0.000000	0.000000	0.026534	0.000000	0.000000	0.217212	0.007548	0.077908
Sum	794.7693	615.7197	676.4814	2769.882	210.1873	428.7809	323.7499	681.4973
Sum Sq. Dev.	2786.535	27.80888	29.67616	22225.00	415.4779	35.67275	66.79110	31.03280
Observations	190	190	190	190	190	190	190	190

APPENDIX 3: CORRELATION MATRIX FOR KEY VARIABLES

	RGDP	LGEXP	LGREV	LPINV	LINR	LINF	LER	LM2
RGDP	1.000000	0.024033	-0.002674	0.108409	-0.057599	0.068635	-0.209958	-0.128695
LGEXP	0.024033	1.000000	0.588557	0.083972	0.096826	-0.025948	0.110100	-0.060297
LGREV	-0.002674	0.588557	1.000000	0.070636	0.042578	-0.210890	0.302185	-0.144572
LPINV	0.108409	0.083972	0.070636	1.000000	0.047169	-0.241291	0.296569	0.162773
LINR	-0.057599	0.096826	0.042578	0.047169	1.000000	-0.252077	0.302687	0.246907
LINF	0.068635	-0.025948	-0.210890	-0.241291	-0.252077	1.000000	-0.634391	-0.143318
LER	-0.209958	0.110100	0.302185	0.296569	0.302687	-0.634391	1.000000	0.266358
LM2	-0.128695	-0.060297	-0.144572	0.162773	0.246907	-0.143318	0.266358	1.000000

APPENDIX 4: KAO (1999) COINTEGRATION TEST RESULTS

Kao Residual Cointegration Test
Series: RGDP LGEXP LGREV LPINV LINR LINF LER LM2
Date: 10/02/18 Time: 19:07
Sample: 1980 2017
Included observations: 190
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 9
Newey-West automatic bandwidth selection and Bartlett kernel

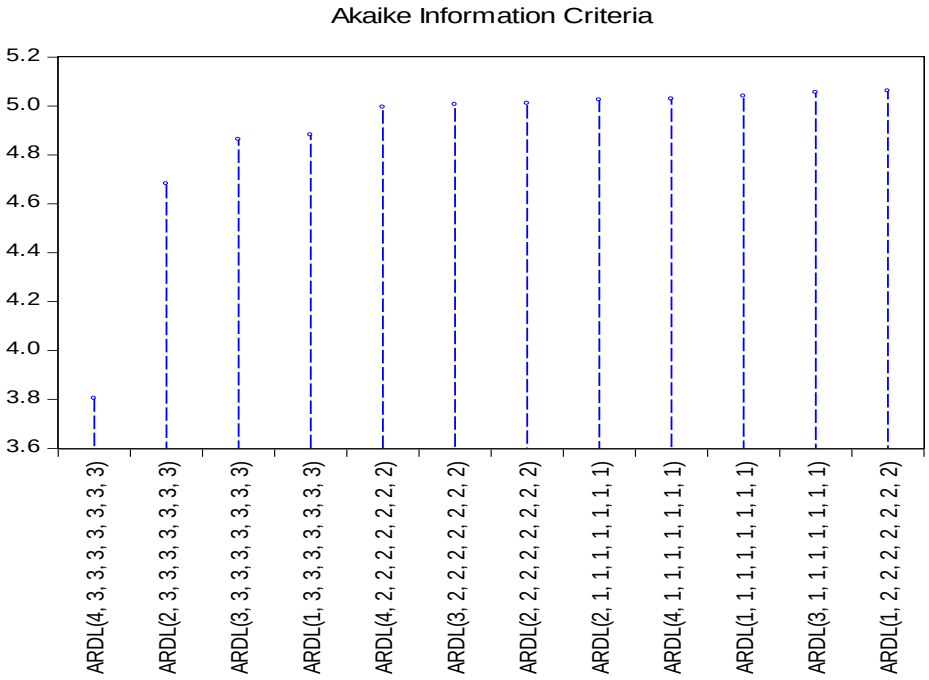
	t-Statistic	Prob.
ADF	-2.997526	0.0014
Residual variance	15.08793	
HAC variance	2.309485	

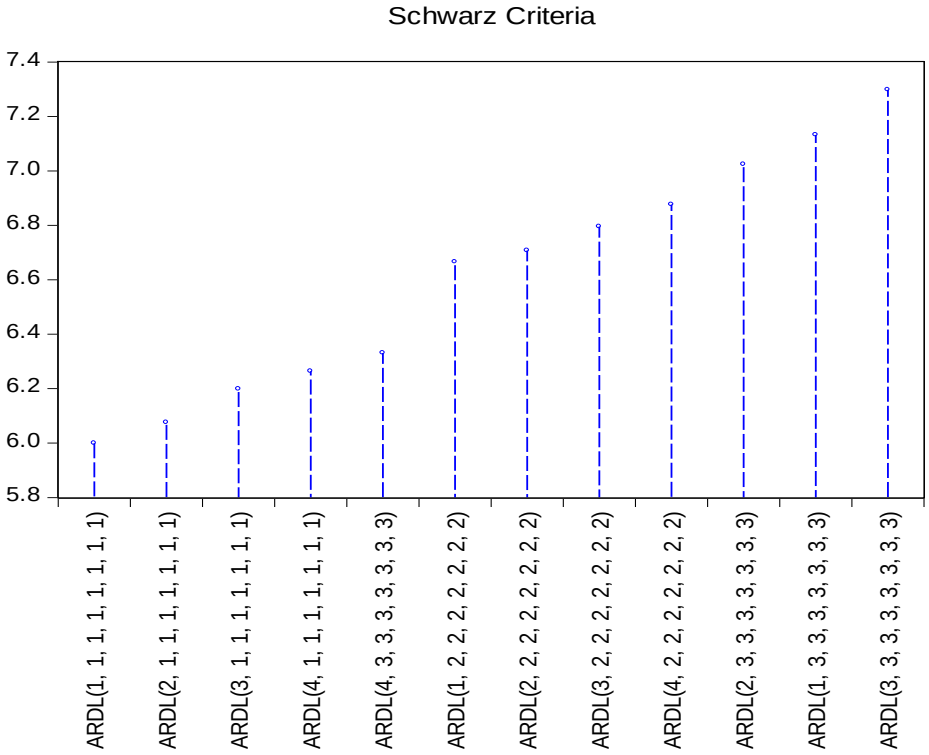
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID)
Method: Least Squares
Date: 09/18/18 Time: 19:07
Sample (adjusted): 1981 2017
Included observations: 185 after adjustments

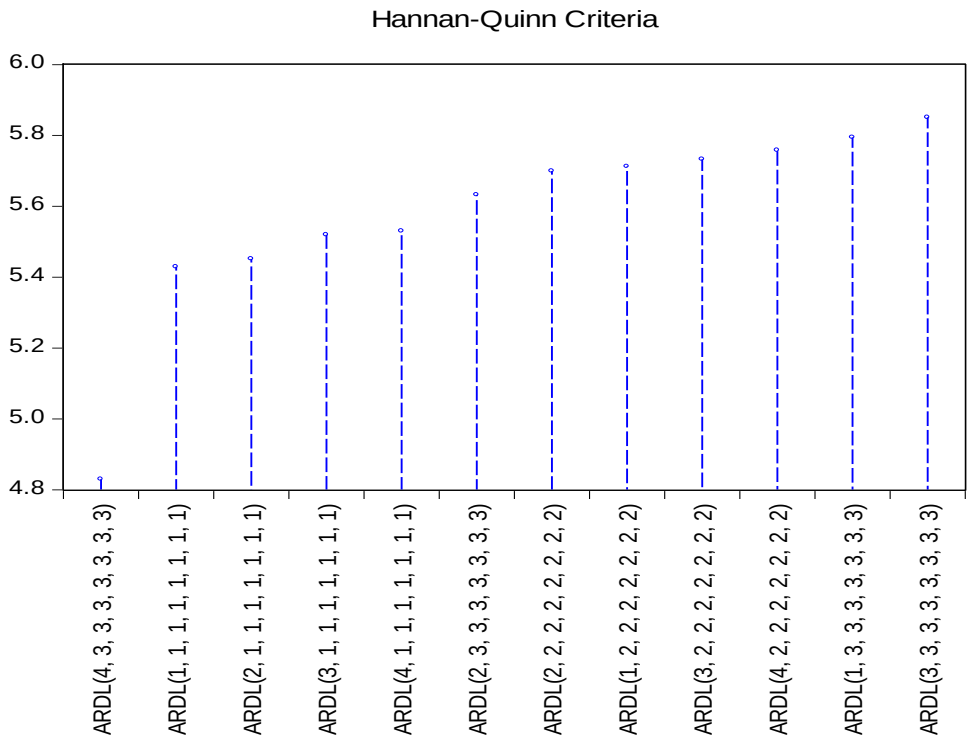
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.750451	0.070200	-10.69020	0.0000

R-squared	0.383074	Mean dependent var	-0.039073
Adjusted R-squared	0.383074	S.D. dependent var	4.069248
S.E. of regression	3.196177	Akaike info criterion	5.167178
Sum squared resid	1879.660	Schwarz criterion	5.184586
Log likelihood	-476.9640	Hannan-Quinn criter.	5.174233
Durbin-Watson stat	2.041156		

APPENDIX 5: OPTIMAL LAGS SELECTION FOR THE DEPENDENT AND INDEPENDENT VARIABLES RESULTS






Hannan-Quinn Criteria
6.0
5.8
5.6
5.4
5.2
5.0
4.8
ARDL(4, 3, 3, 3, 3, 3, 3, 3)
ARDL(1, 1, 1, 1, 1, 1, 1, 1)
ARDL(2, 1, 1, 1, 1, 1, 1, 1)
ARDL(3, 1, 1, 1, 1, 1, 1, 1)
ARDL(4, 1, 1, 1, 1, 1, 1, 1)
ARDL(2, 3, 3, 3, 3, 3, 3, 3)
ARDL(2, 2, 2, 2, 2, 2, 2, 2)
ARDL(1, 2, 2, 2, 2, 2, 2, 2)
ARDL(3, 2, 2, 2, 2, 2, 2, 2)
ARDL(4, 2, 2, 2, 2, 2, 2, 2)
ARDL(1, 3, 3, 3, 3, 3, 3, 3)
ARDL(3, 3, 3, 3, 3, 3, 3, 3)

APPENDIX 6: LONG AND SHORT RUN PANEL AUTO REGRESSION DISTRIBUTED LAGS ESTIMATES

LONG RUN COEFFICIENTS

Dependent Variable: D(RGDP)
Method: ARDL
Date: 09/18/18 Time: 19:21
Sample: 1984 2017
Included observations: 170
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (3 lags, automatic): LGEXP LGREV LPINV LINR LINF LER LM2
Fixed regressors: C
Number of models evalulated: 12
Selected Model: ARDL(4, 3, 3, 3, 3, 3, 3)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
	Long Run Equation			
LGEXP	2.470549	0.452050	5.465218	0.0000
LGREV	0.269042	0.252323	1.066260	0.2911
LPINV	-0.073300	0.006242	-11.74338	0.0000
LINR	-1.094526	0.079505	-13.76682	0.0000
LINF	1.859188	0.178411	10.42081	0.0000
LER	-2.798533	0.114331	-24.47736	0.0000
LM2	1.578238	0.265482	5.944813	0.0000
	Short Run Equation			
COINTEQ01	-0.542559	0.087932	-6.170211	0.0000
D(RGDP(-1))	0.000524	0.470576	0.001113	0.9991
D(RGDP(-2))	0.375118	0.395416	0.948665	0.3471
D(RGDP(-3))	0.268271	0.292977	0.915674	0.3640
D(LGEXP)	-4.101646	6.089099	-0.673605	0.5035
D(LGEXP(-1))	-16.39889	8.424163	-1.946650	0.0569
D(LGEXP(-2))	-6.181414	4.419424	-1.398692	0.1677
D(LGREV)	4.027245	3.813331	1.056096	0.2957
D(LGREV(-1))	5.909264	5.418415	1.090589	0.2804
D(LGREV(-2))	-6.962414	9.257311	-0.752099	0.4553
D(LPINV)	-0.068601	0.046793	-1.466047	0.1485
D(LPINV(-1))	-0.093707	0.082094	-1.141464	0.2588
D(LPINV(-2))	-0.063336	0.062883	-1.007201	0.3184
D(LINR)	0.751311	0.423398	1.774480	0.0817
D(LINR(-1))	0.500609	0.384454	1.302128	0.1985
D(LINR(-2))	0.180804	0.488087	0.370434	0.7125
D(LINF)	2.899386	1.583439	1.831069	0.0727
D(LINF(-1))	-2.487694	0.894969	-2.779643	0.0075
D(LINF(-2))	1.209706	1.759535	0.687515	0.4948
D(LER)	-13.97873	6.629965	-2.108417	0.0397
D(LER(-1))	8.573882	9.443700	0.907894	0.3680
D(LER(-2))	-2.764322	11.36423	-0.243248	0.8088

D(LM2)	-2.756493	8.255784	-0.333886	0.7398
D(LM2(-1))	-6.389087	3.669117	-1.741314	0.0874
D(LM2(-2))	3.903544	6.572679	0.593905	0.5551
C	-8.311324	3.852377	-2.157453	0.0355

Mean dependent var	-0.012734	S.D. dependent var	4.045186
S.E. of regression	2.079123	Akaike info criterion	3.403602
Sum squared resid	229.1059	Schwarz criterion	5.744878
Log likelihood	-186.3422	Hannan-Quinn criter.	4.352019

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

SHORT RUN COEFFICIENTS FOR SOUTH AFRICA

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.392732	0.015248	-25.75623	0.0001
D(RGDP(-1))	-0.727925	0.036338	-20.03232	0.0003
D(RGDP(-2))	-0.373272	0.022083	-16.90292	0.0005
D(RGDP(-3))	-0.234650	0.023788	-9.864331	0.0022
D(LGEXP)	3.480481	135.7736	0.025634	0.9812
D(LGEXP(-1))	48.95415	210.2223	-0.232868	0.8308
D(LGEXP(-2))	10.10293	148.8897	-0.067855	0.9502
D(LGREV)	2.165970	94.47494	0.022926	0.9831
D(LGREV(-1))	9.111717	65.88085	0.138306	0.8988
D(LGREV(-2))	3.065083	35.69444	-0.085870	0.9370
D(LPINV)	-0.051332	0.002290	-22.41586	0.0002
D(LPINV(-1))	0.002760	0.003506	0.787072	0.4887
D(LPINV(-2))	0.024986	0.001287	19.42002	0.0003
D(LINR)	-0.586937	0.359538	-1.632478	0.2011
D(LINR(-1))	-0.541689	0.245619	-2.205398	0.1146
D(LINR(-2))	-1.437797	0.331527	-4.336897	0.0226
D(LINF)	-0.658107	1.763193	-0.373247	0.7338
D(LINF(-1))	-3.275959	1.152766	-2.841825	0.0655
D(LINF(-2))	-2.019092	1.139552	-1.771829	0.1745
D(LER)	-7.254561	11.46172	-0.632938	0.5717
D(LER(-1))	1.831874	8.929063	0.205159	0.8506
D(LER(-2))	1.471298	20.59122	0.071453	0.9475
D(LM2)	23.63092	78.08695	0.302623	0.7819
D(LM2(-1))	-5.136236	61.64701	-0.083317	0.9388
D(LM2(-2))	-13.62108	145.4284	-0.093662	0.9313
C	-3.774481	2.512072	-1.502537	0.2300

SHORT RUN COEFFICIENTS FOR LESOTHO

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.505275	0.012244	-41.26798	0.0000
D(RGDP(-1))	-0.778898	0.017746	-43.89103	0.0000
D(RGDP(-2))	-0.402686	0.018904	-21.30187	0.0002

D(RGDP(-3))	-0.530108	0.026301	-20.15534	0.0003
D(LGEXP)	-10.36817	11.75776	-0.881815	0.4428
D(LGEXP(-1))	-5.806651	17.49595	-0.331885	0.7618
D(LGEXP(-2))	1.239639	15.69001	0.079008	0.9420
D(LGREV)	4.895610	15.57158	0.314394	0.7738
D(LGREV(-1))	-5.593984	12.91224	-0.433231	0.6941
D(LGREV(-2))	-10.80306	12.32111	-0.876793	0.4451
D(LPINV)	-0.113596	0.006351	-17.88720	0.0004
D(LPINV(-1))	0.000566	0.010206	0.055495	0.9592
D(LPINV(-2))	0.026106	0.006655	3.922530	0.0295
D(LINR)	0.085748	0.071055	1.206792	0.3140
D(LINR(-1))	0.072251	0.079651	0.907090	0.4312
D(LINR(-2))	0.504529	0.054237	9.302262	0.0026
D(LINF)	7.460731	3.388012	2.202097	0.1149
D(LINF(-1))	-0.714913	1.684606	-0.424380	0.6999
D(LINF(-2))	6.567625	4.275700	1.536035	0.2221
D(LER)	-14.99021	12.20996	-1.227703	0.3071
D(LER(-1))	5.370917	16.40946	0.327306	0.7649
D(LER(-2))	-13.34206	14.48609	-0.921025	0.4250
D(LM2)	9.428666	9.261162	1.018087	0.3836
D(LM2(-1))	-5.655799	13.46650	-0.419990	0.7028
D(LM2(-2))	14.77233	13.58113	1.087710	0.3563
C	-2.997587	1.652819	-1.813621	0.1674

SHORT RUN COEFFICIENTS FOR SWAZILAND

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.600717	0.111625	-5.380238	0.0000
D(RGDP(-1))	0.889724	0.000422	2106.626	0.0000
D(RGDP(-2))	0.875162	0.000440	1986.864	0.0000
D(RGDP(-3))	0.663409	7.20E-05	9216.240	0.0000
D(LGEXP)	2.661417	0.311247	-8.550813	0.0034
D(LGEXP(-1))	5.916219	0.146455	-40.39623	0.0000
D(LGEXP(-2))	19.89853	0.106089	-187.5653	0.0000
D(LGREV)	3.758823	0.123216	30.50594	0.0001
D(LGREV(-1))	-0.639409	0.232751	-2.747177	0.0709
D(LGREV(-2))	16.48456	0.106120	155.3384	0.0000
D(LPINV)	-0.050569	0.000115	439.4746	0.0000
D(LPINV(-1))	-0.132793	7.55E-05	-1758.633	0.0000
D(LPINV(-2))	-0.226470	3.99E-05	-5675.626	0.0000
D(LINR)	1.396698	0.012998	107.4507	0.0000
D(LINR(-1))	0.427563	0.004867	87.84065	0.0000
D(LINR(-2))	0.717466	0.001830	391.9884	0.0000
D(LINF)	2.561909	0.061413	41.71587	0.0000
D(LINF(-1))	-3.586984	0.027858	-128.7597	0.0000
D(LINF(-2))	3.423874	0.032833	104.2799	0.0000
D(LER)	-36.22129	0.357075	-101.4389	0.0000
D(LER(-1))	29.23887	0.258642	113.0477	0.0000
D(LER(-2))	-39.49001	0.253207	-155.9595	0.0000
D(LM2)	-14.32119	0.544225	-26.31486	0.0001
D(LM2(-1))	-3.198768	0.248514	-12.87159	0.0010
D(LM2(-2))	-17.61933	0.316892	55.60048	0.0000
C	-10.83940	4.385048	-2.471901	0.0899

SHORT RUN COEFFICIENTS FOR BOTSWANA

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.672237	0.133373	-5.040278	0.0003
D(RGDP(-1))	1.384253	0.080693	17.15461	0.0004
D(RGDP(-2))	1.658089	0.088087	18.82340	0.0003
D(RGDP(-3))	1.081681	0.069501	15.56352	0.0006
D(LGEXP)	-23.35291	50.56611	-0.461829	0.6756
D(LGEXP(-1))	-4.679395	68.74217	-0.068072	0.9500
D(LGEXP(-2))	5.244702	93.57148	0.056050	0.9588
D(LGREV)	-7.294995	5.054221	-1.443347	0.2446
D(LGREV(-1))	1.262016	2.877285	0.438614	0.6906
D(LGREV(-2))	1.998609	3.605488	0.554324	0.6180
D(LPINV)	-0.221763	0.006898	-32.14927	0.0001
D(LPINV(-1))	-0.397094	0.008527	-46.57165	0.0000
D(LPINV(-2))	-0.205861	0.007412	-27.77386	0.0001
D(LINR)	1.352260	0.154749	8.738429	0.0032
D(LINR(-1))	1.767124	0.163126	10.83286	0.0017
D(LINR(-2))	1.415615	0.166907	8.481444	0.0034
D(LINF)	5.425219	6.173643	0.878771	0.4442
D(LINF(-1))	-4.779802	7.752056	-0.616585	0.5811
D(LINF(-2))	-3.017688	15.30530	-0.197166	0.8563
D(LER)	-15.75226	75.52633	-0.208567	0.8481
D(LER(-1))	28.14834	53.54478	0.525697	0.6355
D(LER(-2))	28.17413	61.24088	0.460054	0.6768
D(LM2)	-13.10363	22.11363	-0.592559	0.5952
D(LM2(-1))	-20.01283	30.87646	-0.648158	0.5631
D(LM2(-2))	-10.24988	21.57586	-0.475062	0.6672
C	-22.33589	22.59516	-0.988526	0.3958

SHORT RUN COEFFICIENTS FOR NAMIBIA

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.221833	0.007614	-29.13509	0.0001
D(RGDP(-1))	-0.764534	0.037787	-20.23297	0.0003
D(RGDP(-2))	0.118296	0.084718	1.396354	0.2570
D(RGDP(-3))	0.361026	0.056384	6.403031	0.0077
D(LGEXP)	12.39378	42.27936	0.293140	0.7885
D(LGEXP(-1))	-16.63806	72.77777	-0.228615	0.8339
D(LGEXP(-2))	-7.389954	33.25663	-0.222210	0.8384
D(LGREV)	16.61082	302.2473	0.054958	0.9596
D(LGREV(-1))	25.40598	588.1082	0.043199	0.9683
D(LGREV(-2))	-39.42710	312.7321	-0.126073	0.9076
D(LPINV)	-0.006883	0.001427	-4.821970	0.0170
D(LPINV(-1))	0.058026	0.001235	46.96715	0.0000
D(LPINV(-2))	0.064563	0.001531	42.16811	0.0000
D(LINR)	1.508785	0.173659	8.688224	0.0032
D(LINR(-1))	0.777795	0.163016	4.771274	0.0175
D(LINR(-2))	-0.295792	0.143463	-2.061792	0.1313
D(LINF)	-0.292825	2.451314	-0.119456	0.9125

D(LINF(-1))	-0.080814	1.366691	-0.059131	0.9566
D(LINF(-2))	1.093813	2.098713	0.521183	0.6383
D(LER)	4.324664	18.70964	0.231146	0.8321
D(LER(-1))	-21.72059	22.68448	-0.957509	0.4089
D(LER(-2))	9.365029	40.16816	0.233146	0.8307
D(LM2)	-19.41723	30.76491	-0.631149	0.5728
D(LM2(-1))	2.058197	35.40951	0.058126	0.9573
D(LM2(-2))	10.99701	21.45881	0.512471	0.6437
C	-1.609255	0.797835	-2.017028	0.1370

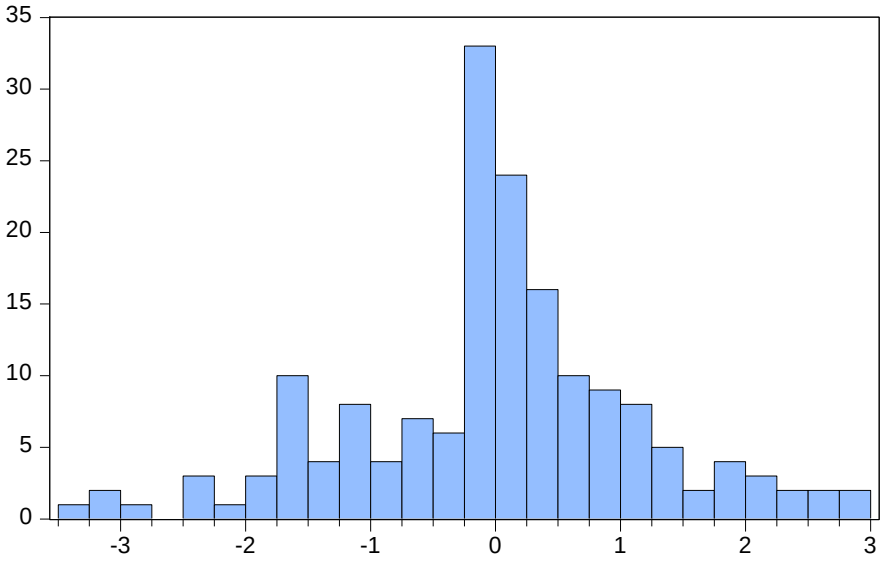
APPENDIX 7: GRANGER CAUSALITY TEST RESULTS

Pairwise Granger Causality Tests
Date: 09/19/18 Time: 01:57
Sample: 1980 2017
Lags: 4

Null Hypothesis:	Obs	F-Statistic	Prob.
LGEXP does not Granger Cause RGDP	170	4.43185	0.0128
RGDP does not Granger Cause LGEXP		0.59687	0.6654
LGREV does not Granger Cause RGDP	170	0.35953	0.8371
RGDP does not Granger Cause LGREV		1.83743	0.1242
LPINV does not Granger Cause RGDP	170	0.75065	0.5589
RGDP does not Granger Cause LPINV		0.25901	0.9038
LINR does not Granger Cause RGDP	170	3.04817	0.0187
RGDP does not Granger Cause LINR		1.00738	0.4054
LINF does not Granger Cause RGDP	170	3.43265	0.0101
RGDP does not Granger Cause LINF		1.08249	0.3670
LER does not Granger Cause RGDP	170	2.09809	0.0835
RGDP does not Granger Cause LER		0.22337	0.9251
LM2 does not Granger Cause RGDP	170	0.61162	0.6549
RGDP does not Granger Cause LM2		1.84605	0.1226

APPENDIX 8: RESIDUALS DIAGNOSTIC TESTS RESULTS

Normality Test



Series: Residuals
Sample 1980 2017
Observations 170

Mean	9.67e-16
Median	0.024479
Maximum	2.975564
Minimum	-3.486025
Std. Dev.	1.164326
Skewness	-0.194882
Kurtosis	3.566883
Jarque-Bera	3.352346
Probability	0.187089

Cross Independence Tests

Cross-Section Dependence Test
Series: RESIDUALS
Null hypothesis: No cross-section dependence (correlation)
Sample: 1980 2017
Periods included: 34
Cross-sections included: 5
Total panel observations: 170
Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	17.95869	10	0.0557
Pesaran scaled LM	0.661582		0.5082
Bias-corrected scaled LM	0.585825		0.5580
Pesaran CD	1.051292		0.2931