NORTH-WEST UNIVERSITY
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The impact of fiscal policy on economic growth in Malawi.

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Dissertation submitted in partial fulfillment of the requirements for the degree of Master's in Economics at the North-West University, Mafikeng Campus

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NOVEMBER 2015

Abstract

This study investigates the impact of fiscal policy on economic growth Malawi. In order to achieve the outcomes of this study, time series data from the year 1981-2014 has been used. VAR model has been used in order to capture the linear interdependence among multiple time series. The results of this study confirm that proper budget structure leads to growth of the economy both in short-run and long run. Thus, the expenditure on Education, Science and Technology will have more value provided that the Agriculture and Food Security is kept intact as it is the main source of revenue for the country. It has been noted that the deficit gap can only be closed if the country widens its source of revenue as reliance on agriculture is becoming unstable due to climate change. The government has to put much emphasis on Energy, Industrial Development, Mining and Tourism as its main sources of revenue though the projection in 2016-2017 has seen a decrease between 4% and 2% respectively.

Key words: Fiscal Policy, VAR, Growth, Government Expenditure

Acknowledgements

I thank almighty God for guiding me through all the work I have done in this dissertation which addresses the effect of fiscal policy on economic growth in Malawi from 1981 to 2014.

I am grateful for the support, material or otherwise, provided by my supervisor, Professor David Daw and Hinaunye Eita and the entire Department of Economics at the North-West University, Mafikeng Campus.

I thank the SANZAF bursary scheme officers for the monetary support they gave towards my study. It is your support which made me achieve this work.

Sayeed Aboobakr Milanzi

Declaration and copyright

I, Sayeed Aboobakr Milanzi, the undersigned, hereby declare that this thesis is my own work and that has not been submitted by someone else at any university. This thesis has not been presented at any other institution for a degree award. All the sources used in this study are solemnly acknowledged.

Signature..... Date.....

Dedication

Without God's mercy and blessings nothing is possible. It is his presence which makes us achieve whatever we get in life. I dedicate this thesis to my parents Mr. and Mrs. Milanzi, and all other relatives who took part in motivating me to work hard.

List of abbreviations

GDP	Gross Domestic Product
MGDS	Malawi Growth and Development Strategy
VAR	VECTOR AUTOREGRESSION
FRDP	Fiscal Restructuring and Deregulation Programme
RBM	Reserve Bank of Malawi
ASEAN	Association of Southeast Asian Nations
PRC	People's Republic of China
OECD	The Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
GMM	General Methods of Moments
EU	European Union
ARDL	Autoregressive Distribution Lag
PMG	Pooled Mean Group
LSDV	Least Squares Dummy Variables
USA	United States of America
AIK	Alkaike Information Criteria
SIC	Schwarz Information Criteria
LR	Linear Regression
LM	Lagrange Multiplier
ARMA	Auto-regression Moving Average

ADF	Augmented Dickey Fuller Test
HQ	Hannan-Quinn Information Criteria

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CHAPTER ONE

INTRODUCTION

1. STUDY BACKGROUND

There are few strategies sought after in connection with Malawi's monetary strategy changes. As a developing nation, Malawi picked parity to surplus and decrease in the general spending plan shortage to allow a lessening of residential obligation as its monetary arrangement. Because of devaluation of the cash and high swelling rate, costs of products and administrations escalated.

Indeed every administration buys products and administrations and raises duties and obtains trusts to fund their use. It is this current government's obligation to deal with its financial plan proficiently. The nation's macroeconomic surroundings were characterised by high expansion rate and overwhelmed with devaluation of the swapping scale which put the nation's financial plan underweight amid the period 2012 and 2013. Malawi has been reliant on created accomplices to meet the expanded requirement for assets for the nation to convey sensible levels of open administration. In this way in 2013, the nation's administration consumption on social administrations, products and administrations were executed by outer stipends. The nation recuperated US$675 million as awards. This measure of cash included US$203 million in spending plan support.

As from 2005, the financial year 2006, the nation's income augmentation encouraged aggregate consumption and net giving in the nation. In 2012, the nation's financial position crumbled because of an expansionist monetary arrangement sought after and a shortage in benefactor back and charge income. The nation was not able to back its consumption because of an absence of stores. Factually, Malawi conceded to have 5.5% setback that is from 7.5% in 2011. Charge income tumbled from 20.8% to 18.8% that year. Because of this poor execution, the nation's monetary shortages ascended from 2.8% in 2011 to 6.8% in 2012. Net residential obligation stock got raised from 14.7% of GDP to 19.5% because of an increment in net household account.

The economy demonstrated recuperation after the nation embraced remedial monetary strategy conformity measures for the financial year 2012-2013. With that sombre measure the nation figured out how to restore financial restraint taught on expert divisions. 70% of the financial

backing assignment on that year was coordinated to Malawi Growth and Development Strategy (MGDS II) need ranges including the social division and sustenance security. Income measure was hence helped.

In 2013, the insight gained demonstrates that the nation needed to fund much of its financial plan shortage in 2005. In 2010, the nation's economy grew by 0.2%. The monetary year 2011 and 2012, saw the deficit ascend by - 0.2% and –7.0% separately. Around the same time much change was seen with just - 1.1% fall in spending plan deficiency. The shortfall is relied upon to rise again in 2015 by - 3.9%.

The financial aspects challenge in 2012/2013 setting was because of a normal macroeconomic test. For example, the kwacha's deterioration coin, high expansion rate and high intrigue rate. The typical cost for basic items rose up and the pay bills expanded due to the need to support common hireling's compensations against the impact of downgrading. In any case, financial weight was anticipated in 2013, and the spending plan execution enhanced uniquely throughout 2012.

Expanded venture spending would diminish the national obligation as a rate of its GDP, lessens government spending plan deficiency and enhances the monetary strength of the nation. Along these lines a low obligation to GDP proportion demonstrates an economy that delivers a lot of merchandise and benefits and in all likelihood benefits that are sufficiently high to pay back obligations.

Correspondingly, government consumption augmentation can take advantage of the economy by influencing the level of salary and its dispersion. Subsequently this can impact individuals' compensation and comes back to capital consequently influencing sparing and speculation, conceivably boosting monetary development. In any case, expanded spending deciphers a more prominent obligation which would not be over the long haul if the administration builds its spending, it may need to either decrease spending in future or build charges with a specific end goal to come back to its unique obligation to GDP proportion.

Government fiscal use and levy can get influenced through government conduct, speculation and sparing towards its guide. Government utilization or current use tends to raise development of the economy. Concerning Cherish and Eagerness (2004) study, and taking into account Malawi monetary totals in the period 1970-2000, it is proposed that guide can have critical effects on

financial totals and budgetary arrangements. Malawi as an area-bolted nation has poor monetary execution. It is subject to help support and holds the monetary execution on track. VAR was utilized as a part of this study with the end goal being to determine some conclusion. The variables were dealt with endogenously as the information was in time arrangement structure.

One of the considerable issues influencing the economy of Malawi is the extreme of local and outside obligations. This makes the adjustment of macroeconomic arrangements troublesome. In investigating the issue, the circumstance has been seen to be expanding since it has been dealt with in seclusion in the previous decades from whatever is left of macroeconomic administration in the vast majority of the creating nations. This continuous obligation increment has for the most part impacted by poor financial money related and adjustments of instalments (Magalasi 2011). An expansionary financial arrangement for occasion could raise interest rates and swelling rates cost of open obligations. It is subsequently noticed that an approach level, obligation administration is incorporated into a general macroeconomic methodology suitable for the nation.

With an expanded spending plan shortage, residential obligation stays costly and devours an extensive portion of GDP and this wonder has extraordinary effect in Malawi as well as for the greater part of sub-Saharan Africa. As the business sectors stay wasteful financing through residential obtaining however is more essential choice now than any time in recent memory in perspective of worldwide budgetary emergency concessions and item value decay.

A local obligation just means government household obtaining including express and certain unexpected liabilities which could have an effect on the monetary allowance. Instruments in household obligations incorporate treasury securities and bills, promissory notes, unfulfilled obligations to suppliers or workers of any huge term, obligations coming about because of profits of benefits framework or monetary division government overdrafts with the national bank on loaned or ensure obligations. In the mid-2001 and 2004domestic obligation expanded because of exogenous stuns, for example, powerless use control in all parts, frail determining of the pay charge and of the interest charge, poor foresight of benefactor spending plan backing to the nation and absence of instrument to adapt up to the event of these stuns including both budgetary misfortunes by household parastatals and effect of outer climate stuns towards horticultural yields.

It has been noticed that the crucial reason for the financial emergency in Malawi is because of government's failure to control consumption and to line inside of its methods, the effect of monetary indiscipline was exacerbated by the instability in benefactor payment of stores and the outer's effect stuns, for example, surges, dry seasons and fuel costs.

In the monetary survey done by Nicco Asset Managers (2001) highlight that Malawi's GDP was determined to be 5.8% in the budgetary year 2014 which indicates awesome change as from 2013. The development is an aftereffect of an increment in tobacco fares and recuperation help contributor's backing.

Swapping scale was relied upon to keep on acknowledging because of tobacco yield change. It was additionally seen that the coin may devalue over the long haul because of exchange parity.

Expansion was diminished to 19.6% in 2014 from a normal of 28.6% in 2013. Then again the monetary shortages expanded as open use trekked than incomes because of decision related spending as the administration anticipated that would have got lower than anticipated income from stipends as contributor.

Malawi has an immense scope of financial conditions which should be met so that monetary strategy must be effectively met. This incorporate financial development enhancements in value and destitution lessening impartial and manageable advancement in monetary conditions implies that the advantages of improvement are shared over the populace and that the example of development serve as levelling capacity.

The principle essence of ordering this study is to survey on whether there still advancement in balancing out the macroeconomic advantages. The nation has seen to be reliant on tobacco item as the primary trading merchandise. It is the required of the state to keep full scale financial conditions stable lower interest rates and controlled swelling rate. The financial irregular characteristics in the nation are once in a while political related.

2. STATEMENT OF THE PROBLEM

This study addresses the impact of fiscal policy on economic growth in Malawi from the fiscal year 1981-2014. In addressing the issue the following questions are answered:

- Is the government adjustment on its expenditure and tax rates influencing the growth of the economy and financial stability?

- To what extent does the government need to spend in order to avoid the country's inflation rate which has been the major problem in the fiscal year 2013?

- Does the government expenditure cover the country's budget deficit which has been in existence in the past few years?

- As the country is experiencing high unemployment and high consumer spending and poor revenue accrued on investments, are there strong policies on which it can rely unlike from donor support?

The government needs to increase its spending which later will be followed by an increase in consumer demand and this will result into a decrease in the value of money. By following John Maynard Keynes' assumptions on expenditure government have to be increasing tax so that the economy gets stimulated. But excess expenditure results in inflation.

3. OBJECTIVES OF THE STUDY

The main objective of this study is to assess the effect of fiscal policy on economic growth in Malawi during the period 1990-2013. With regard to the above mentioned objective this study focuses on:

- Determining the long-run relationship on the government expenditure, tax charges, internal and external debts and budget deficits towards economic growth.

- Determining the solutions on how the government could adjust its expenditure, its tax rates so that it has a great influence on the growth of the economy.

4. HYPOTHESIS OF THE STUDY

This study has been outlined in consideration of the following hypothesis setting:

H0: fiscal policy does affect economic growth

H1: fiscal policy does not affect economic growth

5. SIGNIFICANCE OF THE STUDY

This study has been carried out with the aim of assessing the impact of fiscal policy on economic growth in Malawi. The country lags behind compared to other developing countries due to high expenditure which is mostly dependent on donors. The country experiences increased budget deficit if there are poor yields on the staple tobacco crop and if there is inefficient donor support. Malawi is an agro based economy and as such a poor tobacco yield as a main export product shrinks the economy's performance.

The country experienced high inflation rate in the period 2012 and 2013 due to expansionary policy which the country pursued. The policy led to high tax charges and high unemployment was noticed due to increased budget deficit that the country experienced. It is due to these exogenous shocks that the country faces a crippled fiscus. Even though, that was the case, the problem has been seen to be significantly dependent on the available policies and political imbalance.

The government has to formulate and implement policies locally and nationally on taxation and public spending management. These polices has major effect on economic growth, income distribution and poverty and thus tend to be at the centre of economic and political debate. Unlike other factors growth of any economy is dependent on the government quality of public expenditure and structure of taxation on growth.

Internationally, the country has to adopt some of the policies that other rapidly growing economies are pursuing in terms of fiscal policy adjustment with the view of poverty reduction, income distribution and alleviation of unemployment. In this study, special interest has been shown on public finance systems management across the country with regard to overall size of expenditure, revenue accrued and patterns of fiscal adjustment over time. Detailed government on infrastructure, education, health and social services are all essential instruments for defining

fiscal prudence. The revenue side of the budget and in particular and an important issue on taxation is covered in this study.

This study is valuable in sense that it will guide the society correct ways of fiscal adjustment polices as a small and being agro based economy. Malawi is a small economy with vast growing population such that its expenditure on different sectors of the economy leaves the country onto deficit

6. ETHICAL CONSIDERATIONS

No ethical consideration issues have been applied in this study. As per protection of human rights and policy considerations, not any declaration is going to be applied.

7. LIMITATIONS

This study is based on time series data collected on Quantic website. As it is the case no questionnaires are going to be used for data collection and analysis. Data inappropriateness and lack of control on data quality are some of the envisaged problems in conducting this study.

Secondary data may provide a vast amount of information but quality is not synonymous with appropriateness. The inappropriateness might be that the data collected might represent the whole country while the aim of study at hand is based on a particular region of the country. On the other hand, government and other official institutions often provide guarantee of quality of data but it is not always the case. For this reason quality issues of data needs to be taken into consideration.

8. LAYOUT OF THE DISSERTATION

The study has been presented as follows: the first chapter comprises of full explanation on the effect of fiscal policy on economic growth as an introductory chapter. This chapter has laid out a foundation of the study in that problem statement, objectives of the study and the hypothesis at hand have been defined. Significance of the study and the literature including the methodology followed is as well outlined in the same chapter. Chapter two is based on the overview of the entire study. In this chapter, much emphasis has been put on critical insights on the Malawi's fiscal policies since 1981-2015. Exchange rate structure of the country and its expenditure as well as the effects of interest rates charges on other consumer goods and debts gets affected with change of the policies in the country. Chapter three interrogates the empirical and theoretical

literatures of the study. Methodology and its theoretical framework are presented in chapter three. The chapter also outlines the model specifications and data source as well as estimation technique fallowed. Chapter four provides the results of the study. Lastly, conclusion and policy recommendation is presented in chapter five.

9. SUMMARY

In this area of chapter one, the main gist was to give an explanation of the study background. This has included the introduction of the study, main statement problem and its objectives to be achieved. The hypothesis of the study is stated at the onset of the study. The significance has been included in order to provide the importance of the study and to provide the emerging policy towards the study area domestically and internationally. It has been stated that not any ethical considerations applied in this study.

CHAPTER TWO

An overview of fiscal policy on economic growth in Malawi

2.1 Introduction

The main purpose of this chapter is to provide an overview of fiscal policy on economic growth in Malawi. This section is divided into three parts. Firstly, the discussion on Malawi's fiscal policy from 1990-2015, secondly, few explanations on exchange rate strategies, government expenditure structure, taxation and taxation procedures and indebtedness of the country. In the country fiscal policy management has been a problem before and after independence due to exogenous shocks the country faces.

2.2 Malawi's fiscal policies since 1990 -2015

Malawi as one country striving for the best, different fiscal policies have been pursued with the main intention of gaining economic growth and exchange rate stability. Malawi's economy is basically dependent on outside influences in order to adjust. In so doing according to Keynesian school of thought, two basic fiscal policies have to take place. This is basically whether or not the government has planned to maintain steady prices, an employment level and a growing economy.

Table 2.1: Fiscal policies pursued in Malawi

Fiscal Year	**Policy**	**Results**	**GDP growth %**
1990-2000	Expansionary (fiscal restructuring and deregulation programme)	Two digits inflation rate	7.4 % per annum
2001-2004	Expansionary(macroeconomic stabilisation low interest rate and controlled inflation)	High inflation rate	1.6% per annum
2005-2009	Expansionary(macroeconomic stabilisation low interest rate and	Average growth	6.7 % per annum

	controlled inflation)		
2010-2015	Expansionary(macroeconomic stabilisation low interest rate and controlled inflation)	Average growth	8.3% per annum

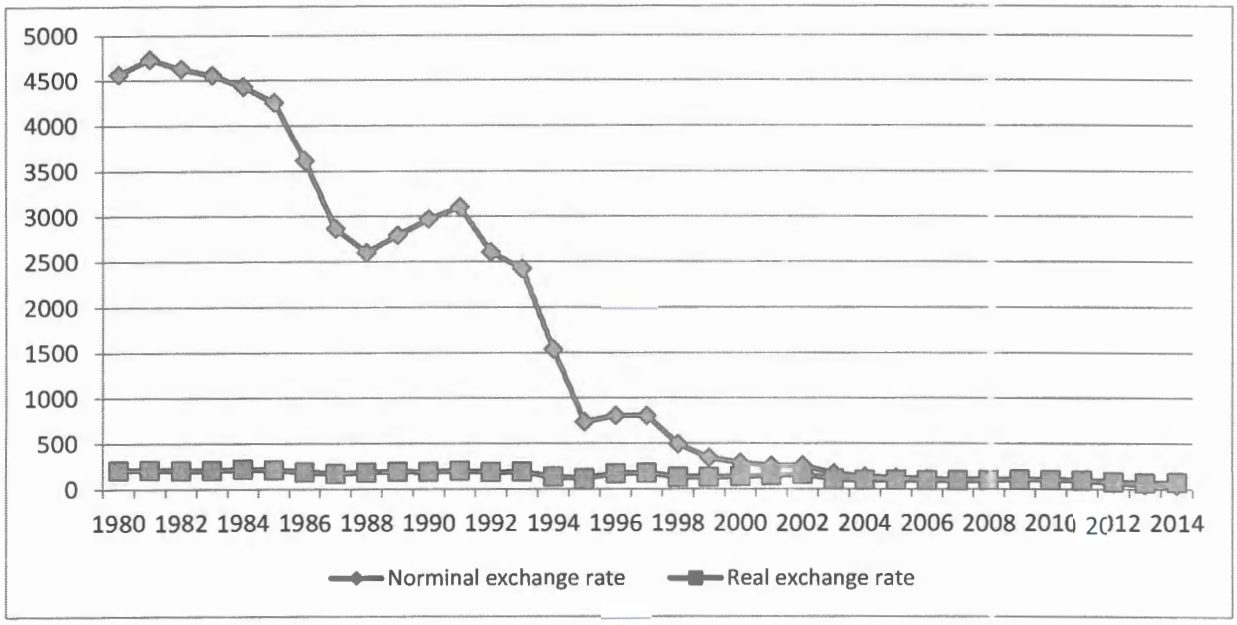
Source: Reserve Bank of Malawi 2015

From the year 1990 -2015 much effort has been put on maintaining government spending and enhancing tax control strategies in order to stimulate the growth of the economy. Particularly, expansionary policy has been applied which normally leaves the country into deficit. Though this is the case exchange rate plays great role in having such deficit on the demand side. Thus government increased government expenditure was automatically not outbalancing the revenue due to lower tax charges. It has been noticed that the wider gap of deficit is mostly occurs when the country has not achieved maximum agricultural outputs. Similarly, the fiscal year 1991/92, 1993/94 and 1994/95 was commonly affected by droughts.

2.3 Exchange rate

With the push of external factors Malawi's exchange rate has been unstable. It has been characterized by the behavior of the economy. Recently the country adopted floating exchange rate regime due to the devaluation of the currency that increase prices of foreign exchange by about 50%. Continued depreciation of the exchange rate and drought induced increases in local food prices pushed inflation rate above its envisaged path. The depreciation had the effect of slowing growth in import demand somewhat, as a result of which international reserves were expected to increase somewhat and to be sufficient to cover two months of imports by the end of 2006. It is official policy to operate a more transparent and flexible exchange-rate regime.

Figure 2.1: Nominal and real exchange rate from the year 1980-2014.



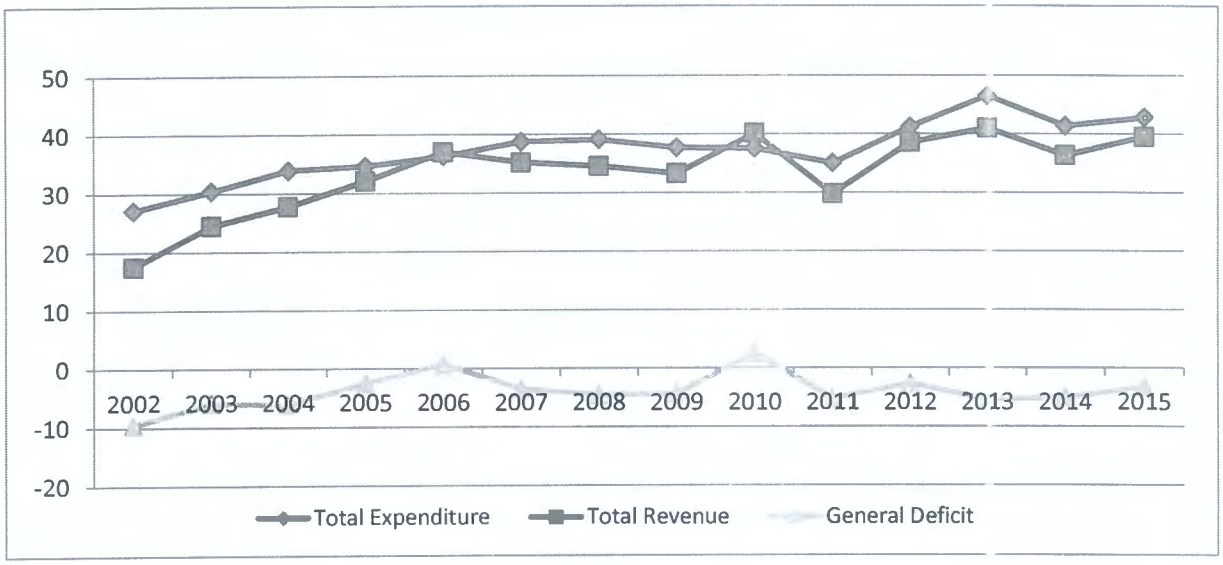
Source: Quantic 1980-2014.

The nominal exchange rate simply states how much of one currency can be traded for a unit of another currency. The real exchange rate, on the other hand, describes how many of a good or service in one country can be traded for one of that good or service in another country. Table 2 above simply shows that from 1980-2002, the rate at which foreign currency can be traded with Malawi kwacha decreased drastically. Thus the exchange of goods and service with foreign countries remained unchanged. A nation with a trade deficit experiences a reduction in its foreign exchange reserves, which ultimately depreciates the value of its currency. A cheaper currency renders the nation's exports more affordable in the global market while making imports more expensive.

2.4 Government expenditure structure

Malawi's budget is structured with regard to the interest of donor support provided to the country. The countries budget allocation comprises of Health, Education, Roads public works and transport sector, agriculture irrigation and water development and natural resource energy and mining sector. It has been noticed that in the fiscal year 2014/2015 the country spend much on health followed by education.

Figure 2.2: General government revenue, Expenditure and Deficit.



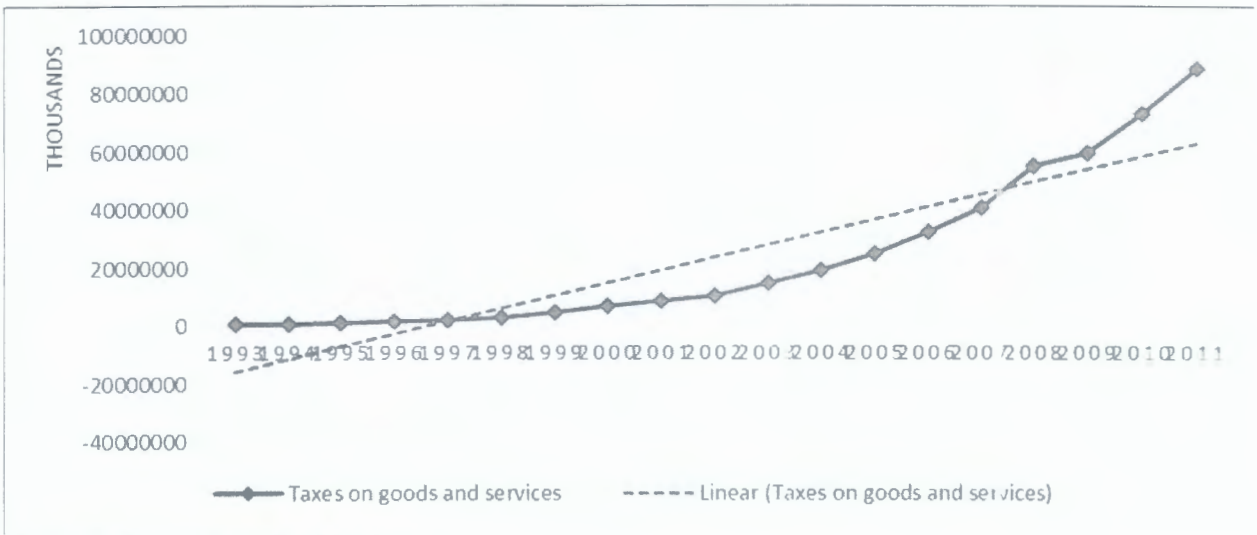
Source: Quantec 2002-2015 fiscal years

2.5. Tax charges

Malawi's government expenditure is always above its revenue and this makes taxation to be more sensitive political and economic tool to be relied on (Simwaka 2010).It has been noticed that tax burden in Malawi has ranged from 11% in the 1970's to around 16% in 2010. Simwaka's shows that a percentage decreases in tax burden would raise economic growth by 0.8% in the country. Thus tax hiking reduces consumption ability both privately and publicly thus hindering government savings rate and therefore widening the deficit gap in the economy.

Taxes on goods and services include all taxes and duties levied by central governments on the production, extraction, sale, transfer, leasing, or delivery of goods and rendering of services, or on the use of goods or permission to use goods or perform activities. These include general sales taxes, turnover or value added taxes, excise taxes, and motor vehicle taxes. Data are shown for central government only and are in current local currency.

Figure 2.3: Tax increase in Malawi



Source: Reserve bank of Malawi

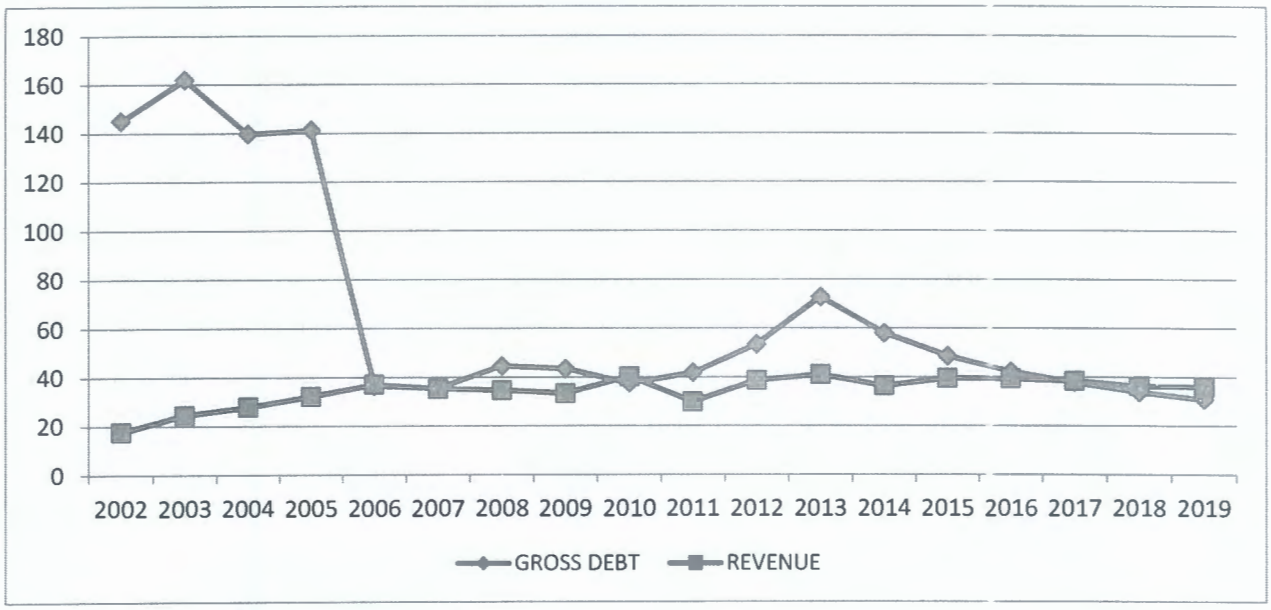
Generally studies shows that taxation instruments under endogenous growth theories into distortionary which discourage investment and human capital. From the year 2002 up to date tax has been on an increase though the countries revenue doesn't give any surplus on the demand side. The country has always been on deficits due to lack of foreign currencies in the country which affect exchange rate pattern. The country rely much on agricultural inputs tobacco being the main export product making the economy venerable when unfavourable seasons comes. The trend shows the possible tax rate if the country might have possible substitutes in its exports to cover up the existing deficits in the economy.

2.6 Internal and external debts crisis

A debt fund is nothing but a pool of investments in which the core portfolio comprises fixed income investments. These would be a mix of short, medium or long term bonds, money market instruments, securitized products and floating rate debt. Domestic public debt or internal debt is not a new phenomenon for developing countries. In the face of budget deficits, against a backdrop of drying up of concessional lending and reduction in development assistance due to the impact of the global financial crisis among other factors, borrowing from domestic markets becomes a viable option. Magalasi (2011) emphasize that the situation occurred as a result of poor attention paid on domestic debt policy development discussions. Much attention was given to external debts due to highly indebted poor countries and multilateral relief initiative programs. This made macroeconomics management policy and stabilization policies difficult. It is advised

to limit external debts as it leads implications for private investment, fiscal sustainability and ultimate economic growth and poverty reduction. When government borrows from the domestic market, they use up domestic private savings that should otherwise be available for private sector lending. Since this leaves fewer resources for the private sector, the cost of the funds rises and in turn private investment demand declines hence fall in capital accumulation, growth and welfare. Most developing countries including Malawi use domestic debt to finance primary deficits and implement monetary policies. Due to lack of foreign reserves the country fails to manage its deficits by using internal funds. As such the country borrows outside which further widen its deficits gap.

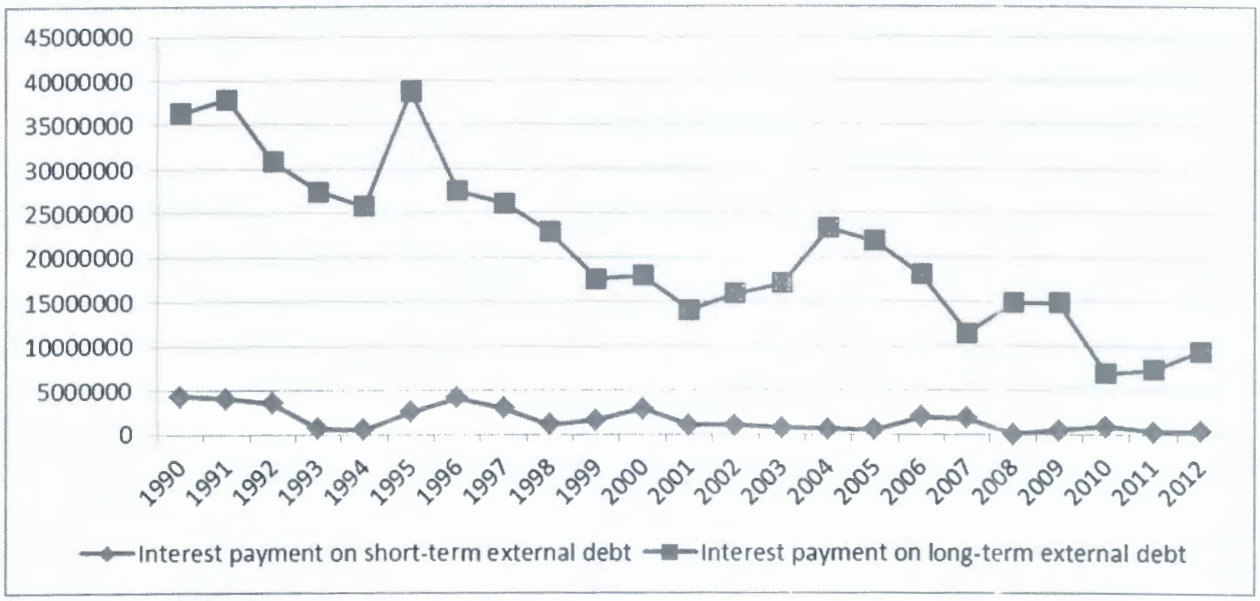
Figure 2.4: Government debt and current budget.



Source: Quantec 2002-2019.

In the Table 5 above in just simplify that from fiscal year 2002 – 2005 Malawi has huge amount of external debt due to droughts in the country which resulted due to unfavourable harvests. The country recovered some of its debts in 2005. It has been noticed that there was no much gap between domestic borrowing and foreign debts. Though this was the case there was still much deficit since the total government debts were correlated to current government budget in those fiscal years.

Figure 2.5: Interest charges on debts.



Source: world Bank

As seen on the Table 6 above the country spend much on long-run interest payment than on the short-run for the debts the country has externally. The returns from the debt mutual funds are influenced by several factors like interest rates, currency fluctuations, inflation rates, and current account deficit of the government, and credit risk. The prices of fixed income securities are governed by the interest rates prevailing in the market. Interest rates and prices of fixed income securities are inversely proportional. If the interest rates increase from the current level, the prices of fixed income securities decrease. Similarly, if the interest rates decrease, the prices of fixed income securities increase.

2.7. Budget structure

In Malawi the budget structure is always formulated in order for a country to meet its goals based on its expenditure strategy. The Financial Statement summarizes the financial outturn of the Government expenditures and inflows for the preceding Financial Years. It also briefly discusses the relationship between the expenditures of Government and key policy documents for instance, the Economic Recovery Plan and the Malawi Growth and Development Strategy (MGDS) II. Likewise, 2013/2014 financial statement shows that budget formulation is sometimes based on whether the world economy is growing or not. For instance 2011/2012 fiscal year was formulated against the expectation of world economy growth backdrop. In Malawi the expenditure is allocated as follows: department of Health department, department of Education,

department of Agriculture, irrigation and water development, department of roads, public works and transport and department of natural resources, energy and mining. Table below shows aggregate percentages of this expenditure.

Table 2.2: Malawi government expenditure estimates and projections

MGDS Priority Area	2014-15 Estimates	2015-16 Projections	2016-17 Projections
Agriculture and Food Security	12%	11%	10%
Transport Infrastructure and Nsanje World Inland Port	7%	6%	6%
Energy, Industrial Development, Mining and Tourism	4%	6%	2%
Education, Science and Technology	18%	18%	20%
Public Health, Sanitation, Malaria and HIV/AIDS Management	8%	11%	12%
Integrated Rural Development	5%	4%	2%
Green Belt Irrigation and Water Development	7%	4%	1%
Child Development, Youth Development and Empowerment	1%	1%	1%

Malawi government 2014-15 budget in brief: citizens' budget

As seen in the table 2.2 above the government allocate its budget more on agriculture and education. Fiscal year 2014-2015 shows that the government spent 12% its expenditure on agriculture and 18% on education. The projections also highlights that the government is going to continue allocating more funds in those fields. That is it has been projected that in the fiscal year 2014-2015 , 11% of the funds is going to be allocated to Agriculture and Food Security and Public Health, Sanitation, Malaria and HIV/AIDS Management and 18% to the department of Education, Science and Technology. This is going to empower the citizen with more knowledge and advance in technology as well as health country.

2.8. Summary

The main focus on this chapter two was to provide a wide overview of the study. In so doing the focus was put on analysing the fiscal policies the country adopted and its impacts on the growth of the economy in Malawi as a developing nation. Furthermore, exchange rate strategies and interest rate charges on domestic and external debts has been analysed in the process. It has been seen that the country has more amount on external debts unlike domestic which puts the country into jeopardy on interest rate payment on those debts including its repayment.

CHAPTER THREE

Literature review

3.1. Introduction

The main aim of this chapter is to provide both theoretical and empirical literature review. The theoretical literature comprises of the theory of endogenous growth, Growth models, neoclassical theory and theory of transmission mechanism. Empirically, the study has focused on the research literature done in sub-Saharan Africa

3.2. Theoretical literature

This section of the study entails the theories behind fiscal policy and economic growth. In this study various models or theories behind the effect of fiscal policy on economic growth are presented below.

3.2.1. New and old growth model

The old and new growth model represents one of the Keynesian greatest economic achievements in 1962 as Nicolas (1962) details in his study. The model later model differs from the earlier with regard to the following findings: Firstly, the study gives clear overview and recognition to the fact that technical progress in fuelled into the economy system through technical progress which is dependent on the creation of new equipment. Secondly, profitability of installed plant has to continually diminish in time owing to the competition of equipment of superior efficiency. Though the installed equipment diminish its profitability after time, it operative life-time is determined by a complex of economic factors which govern the rate of obsolescence and not by physical breakdown. The model avoids the notion of a quantity of capital and the rate of capital accumulation, as variables of the system; it operates solely with the value of current gross investment and its rate of change in time. The macro-economic notions of income, income per head on the other hand are retained. The Keynesian model also assumes that savings in the economy are passive. The level of investment the government can take is dependent on the volume of investments decision made by the government and it's independent of the propensities to save. This is achieved by the profits generated in the economy. On the other hand the model relates an isolated economy with continuous technical progress with a steady rate of increase in the working population which is determined by exogenous factors in the long-run. Similarly, the

model assumes that investment or capital government expenditure is primarily induced by the growth in population itself and that the underlying conditions are such that growth equilibrium necessarily carries with it a state of continuous full employment.

3.2.2. Endogenous growth theory

Endogenous growth theory holds that economic growth is primarily the result of endogenous and not external forces. Endogenous growth theory holds that investment in human capital, innovation, and knowledge are significant contributors to economic growth in any firm. The theory also focuses on positive externalities and spillover effects of a knowledge-based economy which will lead to economic development. With regard to recent studies favoured a model that replaced the exogenous growth variable that is unexplained technical progress, with a model in which the key determinants of growth were explicit in the model (Barro and Salai and Martin (1995).

3.2.3. Neoclassical theory

Neoclassical theory was developed by Solow and Swan (1956).The theory outlines how a steady economic growth rate will be accomplished with the proper amounts of the three driving forces: labour, capital and technology. This theory emphasizes that technology change has a major influence on economic growth, and that technological advances happen by chance. The theory argues that economic growth will not continue unless there continues to be advances in technology. The theory states that by varying the amounts of labour and capital in the production function, an equilibrium state can be accomplished. When a new technology becomes available, the labour and capital need to be adjusted to maintain growth equilibrium.

3.2.4. Ricardian equivalence theory

The theory was formulated by David Ricardo (1771-1823). The theory provides much explanation on the relationship between tax or debt use in financing. Seater (1993) provides clear explanation on Ricardian equivalence theory. The theory provides justification on government expenditure, tax charges on goods and services matters in the long-run growth of the economy. Thus debt and tax mix is regarded irrelevant because debt implies future taxes with a present value equal to the value of the debt. This is derived from the assumption drawn from traditional theory which shows that an increase in deficit is regarded as a short-term stimulus to output and employment, thus raise in interest rates and crowding out effect. Thus consumers will respond to

tax cut by saving the rest of the income equivalent to tax cut. Intuitively, the tax cut is financed by internal and external debts thus holding future spending fixed, this implies high future taxes to finance the money borrowed.

3.3. Empirical literature

3.3.1. Introduction.

In this section various empirical literature based on the impact of fiscal policy on economic growth is analysed. Amin (1998) articulates that unlike Malawi economy, Cameroon economy was basically agricultural dependent coupled with petroleum production. Time series data from 1961-1994 was utilised. The key indicators was noticed to have declined

3.3.2. Studies done in Malawi

Chiumia and Simwaka (2012) express that Malawi as other developing countries aims at improving economic standards continues to operate with revenue below expenditure and taxation. The study was successful with the use of 1970-2010 time series data and Engel and Yoo's three steps estimation was used. The study points out that reduction in tax burden and reversal in donor funding is more potent in influencing economic growth than fine tuning the proportion in which income and consumption taxes are collected in Malawi. Government expenditure management and taxation has become the major tools for revenue generation and economic growth. In Malawi tax operations is grouped into two groups. Those that are levied on expenditure, that is PAYE and VAT of respective company profits, earnings of employers, import duties and excise duties form the Malawian tax base, in the country. Though the tax collection is too slim in the country, the objective remains that of raising revenue fairly, to ensure that growth and equity are met.

Mangani (2010) suggest that the trends in the performance of Malawi economy are influenced by many factors, Agriculture productive volatility international economy developments, International relative and domestic policy. This trend of factors attributes to shift in economy management and improved domestic relative as well as rain fed agriculture layouts, Agriculture output remain the main target in the country as other resources like mining sector SHILL in the country Reserve Bank of Malawi (RBM) and Malawi's growth and development strategy (MGDS). All these play a great role in stimulating expansionary policy and enhancing growth and poverty reduction through economic diversification and wealth creation among other notable

goal. Malawi stared at an economic growth target of 6% per annum as set by MDGS. This growth is estimated through outcome from agriculture, manufacturing and service sector in the country. The study followed VAR estimation process thus Granger causality and block exogenity tests were carried out and Monthly data from January 1994 to March 2009 were used in the process.

3.3.3. Studies done in sub-Saharan Africa

Amin (1998) places significant emphasis on the Cameroon economy. The study used time series data from the year 1961-1994.The country is agro-based, like the economy of Malawi. Though much improvement was achieved in the year 1998, the economy had high budget deficit as its major weakness. Public expenditure was planned to be reduced with the hope of increasing revenue. With regard to the Cameroon's economy, it is important to note that the effectiveness of private sector depends on the stability of predictability of the public incentive framework which automatically promotes or crowds in private investment. It has been noted that the effectiveness of private sector productivity depends on the performance or quality of government spending in the economy.

Akanbi (2013) recommends the above mentioned scenario but further clarifies the effectiveness of public expenditure in reference to the South African economy. The study was successful with the use of time series data collected from the year 1970-2011 and Engle and Granger (1987) two-step estimation technique was adopted in the process. The study results suggest that fiscal policy actions are more effective in an economic environment with limited or no supply constraints. Fiscal expansion or consolidation that comes more from government spending changes will be more effective in an economic environment where structural supply constraints are absent while tax revenue changes will be more effective in an economic environment where there exist major structural supply constraints. The country has embedded with structural supply constraints. Thus Keynesian theories remain the major tools in stabilising the economy in the short-run. The economy's major finance comes from tax revenue, thus 95% of its expenditure is tax financed and only 30% comes from government expenditure. The study shows that fiscal policy which put much effect on an increase in public expenditure is more effective in an economic environment where there is absence of structural supply constraints while more tax charges will be effective only in the environment where there exist huge structural supply constraints

3.3.4. Studies done in Asian countries

Tang et.al (2013) contrasts like effectiveness of fiscal policy in Indonesia, Malaysia, the Philippines, Singapore and Thailand by using VAR model. The study used quarterly data from mostly 1990:1 to 2009:4 for the five main ASEAN countries (Indonesia, Malaysia, the Philippines, Singapore and Thailand) and it was collected from various sources such as the CEIC database, the World Bank's World Development Indicators and websites of national statistical offices or central banks. It has been noted that government spending is found to have weak and largely insignificant impact on output, while taxes are found to have outcomes contrary to the theory. The study also emphasize that standard Keynesian multiplier denotes to be greater than one unlike neoclassical school which signifies its multiplier to be less than one. The intuition of multiplier being greater than one does not always hold due to other factors like degree of monetary policy, exchange rate regime, economic openness and extent of financial development. It has also been noted that the multiplier could be less than one only in flexible exchange rate regime, where high interest rates caused by higher government spending leads to an appreciation of the domestic currency thus increasing imports at the expenses of exports. Unlikely the openness of the economy leads to government spending hiked through high imports could be high thus leading to small multiplier.

Jha (2014) examines discretionary fiscal policy effectiveness to stimulate the country's output. The study was conducted in Asia and VAR model was utilised. Quarterly data for 10 emerging Asian economies that is People's Republic of China (PRC), Hong Kong, China; India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan; and Thailand were used. The study shows that government expenditure has not only have an impact on its fiscal size but as well its composition, that tax cuts and government spending. Public spending has seen to be mainly focused on government direct purchase of goods and service which includes spending on public work and infrastructure for instance roads and power plants. Fiscal policy has to be less counter-cyclical in developing countries that in high income countries. The study further demonstrates that emerging market policies are predominantly pro-cyclical and thus excavate rather than moderate business cycle. Furthermore, low income countries automatically stabilisers are pro-cyclical due to institutional failure and lack access to finance during economic downturns. Lastly developing countries has seen to be not active in pursuing restrict fiscal policies compared to developed states.

Katsaiti (2013) indicates that current world affairs and economic performance in different countries are associated by natural resource allocation, corruption and bad economic performance. The study followed VAR model and panel data from 79 countries were utilised in analysing the outcomes from the year 1984-2008. The study generalises that better governance, stronger democratic institutions such as research and developments units and transparent budget improve fiscal performance leading to high growth rate.

3.3.5. Studies done in OECD region

Kneller (1999) shows that the neoclassical growth model does not provide any evidence on the issue whether the share of government expenditure in output or the composition of expenditure and revenue affect the long-run growth rate. The study used a panel data from 22 OECD countries from the year 1970-1995. Pooled OLS estimation was used in this study. The study shed lights that tax and public expenditure measures influence the saving rate or incentive to invest in physical or human capital ultimately affect the equilibrium factor ratios rather than the steady state growth rate. Distortionary taxation reduces growth and productive government expenditure enhances growth. That is taxation on income and profits, social security contribution, payroll and man power and property. The productive expenditure refers to general public service expenditure, defence, education, health and transport and communication expenditure.

3.3.6. Studies done in Europe

Baldacci and Hillman (2004) show that sustained reductions in government budget deficits increase GDP or growth of real income levels to expansionary fiscal contractions. The study shows that private investment is regarded as the main transmission channel through which fiscal policy affects growth in high income countries. Unlike low-income countries, fiscal policy performance is easily traced through good governance, strategic management application and other considerations relevant in the growth of the economy. The findings prove that factor productivity in low-income countries is more effective that investment as a channel for increasing growth through fiscal policy effectiveness. Empirical results reported in this paper confirm this expectation which shows that in low-income countries the factor productivity is more effective than investment as a channel for increasing growth through fiscal policy. Although the private investment response to fiscal contraction may be minor, high-deficit low-income countries can nonetheless benefit by reducing unsustainable fiscal deficits because of

governance-related productivity responses that increase growth. Similarly, a standard Keynesian macroeconomic model proves that fiscal policy tightens private sector investment by enhancing domestic demand. In poor governance economics, corruption has a great impact on fiscal policy and this reduces the effectiveness of capital spending.

Gallo and Sagales (2013) emphasize that distributive fiscal policy strategy has become crucial in achieving a broad based stable path of economic growth as economic inequalities get reduced and determination of its effects on economic growth rate are made feasible. The study used unbalanced panel data on 21 high-income OECD countries from the year 1972-2006. The study followed OLS Estimation technique. The results show that distributive expenditures and direct taxes may produce significant reductions in GDP growth and net income inequality reflecting the standard efficiency–equity trade-off associated to certain fiscal policy measures. Finally, the results also indicate that the most adequate fiscal policy strategy in a context of fiscal consolidation is to cut non distributive expenditure, since this could increase GDP growth while reducing income inequality Fiscal policy vary across countries as such some nation may pursue low tax rate while others progressive fiscal spending system depending on the performance of the economy. The study highlights that choice of different public policies in different nations may be the outcome of the economic interest of those nations.

Nijkamp (2004) indicates that the main areas at which fiscal policies are mostly concerned are government, consumption, tax rates, education expenditure, defence and public infrastructure. The study covered 93 published studies, yielding 123 meta-observations in examining the robustness of the evidence regarding the effect of fiscal policy on growth countries and meta-analysis technique was applied in assessing the results of the study. The study was achieved by using data from the year 1983-1998.The evidence on the analysis shows to be weak based on the variables used. Expenditure on education and infrastructure was rather recognised to be robust.

Teles and Musolini (2004) demonstrate that the level of public debts to gross domestic product (GDP) ratio should be negatively skewed towards the effect of fiscal policy on economic growth. Government indebtedness is regarded as the main cause of that negativity as a portion of young people's savings gets extracted to pay interests on debts. The study applied unbalanced panel data from the year 1972-2004. OLS and GMM estimation techniques were used in analysing the study findings. The study proposes a theoretical model of endogenous growth that demonstrates that the level of the public debt-to gross domestic product (GDP) ratio should negatively impact

the effect of fiscal policy on growth. This effect occurs because government indebtedness extracts a portion of young people's savings to pay interest on the debts. Therefore, the payment of debt interest requires an allocation exchange system across generations that are similar to a pay as you go pension system, which results in changes in the savings rate of the economy. The payment of debt interest requires an allocation exchange system across generation that is similar to pay as you go, pension system which results in the savings rate of the economy. Lastly the effect of public debt varies according to the nature and composition as well assize of six burden charged.

Giavazzi et.al (2000) shows that the expenses of natural saving to fiscal policy may be non-linear. By using OECD and developing countries time series data set from the year 1960 – 1995 sourced from world Penn tables, the study shows the presence of non-linearity effects. Thus an increasing in net taxes has no effect on national saving during large fiscal contractions while it has a positive effect in less pronounced contractions. A fiscal contraction often reduces interest rate, raising the market value of stocks, bonds and real estate in the country, thus stimulating aggregate demand in the economy. The situation can also change people's view of the future and thus the valuation of their human capital. It has been shown that due to high or rapidly growing debt the outcome of consolidation is more likely to be expansionary similarly fiscal impulse of private sector behaviour depends on the size and persistence of the impulse in that period. Lastly the private sector response may differ depending on whether the budget as cut by public sector wages and reducing social security benefits or by increasing taxes and cutting public investment.

Garmignani (2008) confirm that larger fiscal deficits tend to penalise growth even though public spending on certain items for instance education, health and infrastructure has positive dynamic effect. VAR model was used in analysing the study results. Unbalanced panel data from the period 1990–2003 was used in analysing the results of the study and results show that public expenditure on certain social economic items effectively promotes better social outcomes in transition economies. The results of the study shows that fiscal policy has Keynesian effects in transition countries and non-Keynesian effects in high-income OECD economies, but only outside normal times, secondly, the study further shed light that public health and social protection expenditure improve social outcomes, and lastly, the study shows that there is evidence of electoral business cycle of fiscal policy in both transition and high-income countries

Sacchi and Salotti (2015) acknowledge that the adoption of fiscal discipline in the public sector strengthen fiscal performance. The study took place in 21 OECD countries over the 1985–2012 periods. Annual panel data was used in the process and one and two step GMM was used. The study highlights that the aggressive use of discretionary fiscal policy, particularly of government consumption items, leads to higher volatility of output and, to a lesser extent, inflation. However, when strict fiscal rules are introduced, discretionary policy becomes output-stabilising rather than destabilising. This result can be more easily achieved by rules on balanced budgets, rather than on expenditures, revenues, or debt. On the other hand, fiscal rules are unable to affect the inflation destabilising nature of discretionary policy, if any, probably because of the higher importance of central banks in that respect Both budget deficit and political failure may affect the growth of the economy .Poor policies may results into high public expenditure on unnecessary sectors thereby resulting into high deficits which may lead to indebtedness. Similarly, poor, fiscal policy may results into inflation and output destabilisation.

Castro (2011) confirm that an increase in debt-GDP ratio could force interest rate upwards which could increase the burden of government debts in other countries and would force them to follow more restrictive fiscal policies to stabilise their debt-GDP ratio as in the case of EU region .The study was done on 15 European Union countries and 8 OECD countries over the period 1970–2005 to analyse this issue. Panel estimations using fixed-effects, pooled mean group and system-GMM estimators were applied. The study shows that the improvement of budgetary balances in Europe was the results of a high economic growth rather than active policy adjustment. Therefore, good economic performance may results into an improvement in budgetary position in the log-run.

Carrera and Verga (2012) suggest that fiscal sustainability is achieved when the public sector debt-GDP ratio is stationary and constant with overall demand both domestically and internationally. The study used VAR model and quarterly data for the period 1999–2007 in assessing the robustness of the results. The study also denotes that real exchange rate also affect fiscal sustainability not only through the change in value of the foreign currency denominated public debt but also because a high debt to GDP ratio leads to high interest rate and to low potential GDP growth rate, changing the path of primary balances consistent with fiscal sustainability. The fiscal adjustment required after devaluation increases with the size of the devaluation, the length of the adjustment period, the effect on interest rates and growth, and the share of public debt denominated in foreign currency. Domestic currency denominated debt may

also affect policy sustainability as it requires real devaluation of the currency as this brings trade shocks and other economic disturbances.

Carrere and Melo (2012) extrapolate the fiscal spending and economic growth by using data from 140 OECD countries of which 118 are developing and 22 fully developed states from the period 1972–2005. The study followed Probit and Tobit estimation process. The study shows that capital expenditure as well as spending on education, health and transport and communication can be favourable to growth of the economy when the government budget constraint is simultaneously taken into considerations in the overall equations if resource are allocated accordingly in the budget layout, not shocks are encountered in the economy. Proper policy layout shapes the direction of the government expenditure.

Engen and skinner (1992) deduce that one of the government views towards fiscal policy is that of shift of dynamic economic growth achievement through the distortion effects of taxation and inefficient government spending. The study used data from the year 1970-1985 and OLS estimation was used. With regard to this study government expenditure is basically measured by following three general approaches. Firstly, introduction of average level of government spending or tax rate in the overall country regression on growth rate. Secondly, fiscal policy can have a permanent impact on equilibrium steady-state growth path provided that the distortions on taxation towards output growth rate far exceeds that of traditional measure. Lastly, the approach relies on equilibrium conditions to derive empirically tractable estimation equations. This implies that, though fiscal policies are far from steady-state. In equilibrium the ration is constant over time.

Tanzi (2004) define fiscal policy as all policies related to taxes and expenditure. The study infer that Keynesian revolution changed fiscal policy from tax or revenue side of the budget to include both revenue and government expenditure. Keynesian defined fiscal policy as the manipulation of tax and public spending to influence aggregate demand in the society

3.3.7. Studies done in USA

Aghion (2014) emphasize that industrial growth is dependent on fiscal policy outline. The study shows that the effects of fiscal policy on industrial growth is basically constrained in short-run macroeconomic policy which possibly undertaken in the aim of smoothing business cycle. The study was done on 25 OECD countries and difference in difference methodology in panel data

from the year 1980-2005 was used. The results of the study shows that industries with a relatively heavier reliance on external finance or lower asset tangibility tend to grow faster in terms of both value added and of labour productivity growth in countries that implement fiscal policies that are more countercyclical. It has been noted that industries which rely on the external finance (external debts) experience countercyclical fiscal policy. The robustness of the results was derived from financial developments, inflation and variable fiscal deficits.

Martinez-Vazquez (2003) affirm that though fiscal decentralisation may lead to high economic growth, there still exist a doubts on whether this may be successful due to other factors like consumer efficiency, producer efficiency , the geographical distribution of resources , macroeconomic stability and corruption. The study was done within OECD region. Therefore, the study could not find any proper solution on whether the mentioned variables could results into effectiveness of growth. The assumption shows that decentralisation implementation will improve growth, equality or macroeconomic stability.

Catao (2005) suggests that persistent deficits are inflationary due to expansionary policy in the long-run. Panel data was used on 105 countries from the period 1960-2001. The study followed autoregressive distributed lag (ARDL). The study shows that show a strong positive association between deficits and inflation among high-inflation and developing country groups, but not among low-inflation advanced economies. The study highlights that fiscal deficits on inflation is dependent on the countries level of financial markets and more credible policy commitment to low inflation, deeper financial markets and more credible central banks in advanced economies tend to facilitate debt stock and the need for inflating the debt away.

Gupta (2005) support the view that budgetary position is generally associated with high economic growth both in the short-run and long-run terms. Panel data from 31 low-income countries was used in the period of 1990-2000. The study used Generalized Method of Moments (GMM), a pooled mean-group estimator (PMG) and a Least Squares Dummy Variable (LSDV) estimator in order to assess robust results of the study. The study demonstrate that expenditure on wages may lead to lower growth unlike allocation of high shares to capital, in which faster growth in output is easily recognised . The findings of the study show that strong budgetary positions are generally associated with higher economic growth in both the short and long terms. The composition of public outlays also matters that is countries where spending is concentrated on wages tend to have lower growth, while those that allocate higher shares to capital and

nonwage goods and services enjoy faster output expansion. Finally, initial fiscal conditions also have a bearing on the nexus between fiscal deficits and growth. Similarly, a reduction in budget deficit results into an increase in per capita growth.

Woo (2011) take into considerations the effect of fiscal volatility towards economic growth and income distribution. The study used annual panel data from the period 1960-2000 and OLS was used in analysing the study results. The study presents evidence that there exist negative relationship between initial income distributions towards long-run economic growth.

3.4. Assessment of the Literature

The study has been outline with the aim of assessing some of theoretical and empirical literature behind the effect of fiscal policy on economic growth in Malawi based on the studies done worldwide. Theoretically, new and old growth model, endogenous theory of growth, transmission mechanism and neoclassical theory has been used. Empirically, studies done from various areas worldwide have been used. That is studies done in Malawi, Europe, USA, Asia and Sub-Saharan Africa.

3.5. Summary

Various literatures from different countries have been used in this study in order to gain critical outlook of this study empirically and theoretically. Theoretically, the study has focused on the relationship of the economic achievement in the country with regard to the findings of Nicolas (1962) on the new growth models. (Barro and Sala-i-Martin (1995) add on by expressing the effect of technology change on economic growth under endogenous growth model. Solow and Swan (1956) put much emphasis on capital accumulation

CHAPTER FOUR

Methodology

4.1 Introduction

This section of study comprises the analysis and techniques applied in this study. The first part of this section will cover the model specification which comprises the variables used and its definition. Estimation technique and data source will be followed.

4.2 Theoretical framework

Theoretically the study follows VAR modelling process as indicated in the studies done by Gupta (2005), Carmignani(2008), Mangani (2010), Castro (2011), Woo(2011), Carrera and Verga (2012), Tang et al. (2013), Anshary (2013), Jha et al (2014). Brooks (2008) shows that Vector autoregressive models (VARs) were popularised in econometrics by Sims (1980) as a natural generalisation of univariate autoregressive models. The study basically tries to expand effect of multivariate.

4.3 Model specification

In this study the model has been specifies with regard to the intuition that the long run relationship of the variables are easily noticed by the application Engel-Granger cointegration model. This study adapts the study done by Gupta (2005) and Mangani (2010). The study done by Gupta et al. presented VAR Model in the following format:

Model 1 was based on budget components. Revenue and expenditure is measured as share of GDP in the process. The equation was presented as follows:

$$g_{i,t} = \alpha + \sum_{l=1}^{k} \beta_l Y_{ilt} + \sum_{h=1}^{q} \beta_h \mathrm{XGDP}_{iht} + u_{it} \qquad 1$$

Whereby *g i,t* represents the growth rate of real per capita, *Yilt* is the vector of non independent variables in the equation, that is GDP per capita, private investment ration,terms of trade , labour force and initial level of primary and secendary enrollment rates. Lastly XGDP *iht* is the vector of independent fiscal policy variables aimed at capturing the effect dof the composition of the budget.

Model 2 assess the fiscal balance as share of GDP and expenditure composition by economic category. The model was presented in the format below;

$$g_{i,t} = \alpha + \sum_{l=1}^{k} \beta_l Y_{ilt} + \sum_{h=1}^{q} \beta_h \mathrm{XBALEXP}_{iht} + u_{it}$$

In the equation above , the first and second varibale is explained in the eqation 1. The variable XBALEXP *iht* represents vector of independent fiscal variables aimes at apturinf the effect of the budget balance and composion if expenditurres.

Model 3, represented as shown below;

$$g_{i,t} = \alpha + \sum_{l=1}^{k} \beta_l Y_{ilt} + \sum_{h=1}^{q} \beta_h \mathrm{XFINEXP}_{iht} + u_{it}$$

3

In the model above the XFINEXP *iht* represents domestic and external financing calculated in percentages of GDP.

In this study the model has been specified as follows;

GDP = f (XRATE, INFL, INTRATE, TAX, GOVEX, CPI, DEBT)

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The function simply shows that GDP, XTRATE, INTRATE, TAX, GOVEX and CPI are positively related to budget change. INFL and DEBT seem to have negative effect towards budget as it can lead to budget deficit as the country becomes indebted or high cost of living due to high inflation rate. With regard to the above function the following model has been produced:

GDP =α+XRATE+INFL+INTRATE+TAX+GOVEX+CPI+DEBT+μ

A in the equation simply represents the constant and μ unexplained variables which can as well affect budget change.

4.4 Definition of variables

The variables used in this equation are defined according to how it was calculated and the values each variable adds towards the budget outline. In this study the variables are defined as follows.

GDP: representing the economic performance in the country from the year 1990-2014.

XRATE: represents exchange rate changes in the country with regard to appreciation and depreciation of other currencies in neighbouring countries and its trading partners.

INFL: represents inflation rate changes in the country either due to expansionary policy pursued by the country or other exogenous cause.

INTRATE: represents interest rate charges the country follows.

BDFCT: this is the budget deficit of the country .It represents the difference between the Country's revenue and its total expenditure and it is calculated annually.

TAX: This is the taxation which is levied on all consumable goods and service charges in the Country. This comprises all sorts of tax in which the country uses in order to accrue income

GOVEXP: This represents all sorts of expenditure the government makes in order to meet all the needs of the country. It represents all expenditure it makes in different sectors of country's economy.

CPI: This accounts for measures changes in the price level of a market basket of consumer goods and services purchased by households. The CPI is a statistical estimate constructed using the prices of a sample of representative items whose prices are collected periodically. The data under this category was extracted from World Bank.

GDEBT: Government debt which is also known as public debt, national debt and sovereign debt is the debt owed by a central government. In government state, government debt may also refer

to the debt of a state or provincial, municipal or local government. By contrast, the annual government deficit refers to the difference between government receipts and spending in a single year that is the increase of debt over a particular year.

4.5. Data source

In this study time series data from the year 1981-2014 is used. The data was collected from Quantec. The study has Malawi Real interest rate calculated in percentages as used in this study. Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans. It is the gross amount of government liabilities reduced by the amount of equity and financial derivatives held by the government. Because debt is a stock rather than a flow, it is measured as of a given date, usually the last day of the fiscal year. Data are in current local currency.

4.6. Estimation technique

4.6.1. VAR Modelling

The effectiveness of this study lies on the analysis of VAR. It is a systems regression model that is there is more than one dependent variable that can be considered a kind of hybrid between the univariate time series models and the simultaneous equations models. VARs have often been advocated as an alternative to large-scale simultaneous equations structural models as other literatures indicates. VAR Model is basically used to capture the linear interdependence among multiple time series. The Model generalise the univariate autoregressive model by allowing for more than more evolving. All the variables in a VAR MODEL are treated systematically in a structural sense; each variable has an equation explaining its evolution based on its lags and the lags of the other model variables. VAR modelling does not require as much knowledge about the forces influencing a variable as do structural models with simultaneous equations. The only prior knowledge required is a list of variable which can be hypothesised to affect each other inter-temporally.

VAR model can simply be presented in the equation format as follows as in the case bivariate, that is only two variables are included in the equation, this can be Y1 and Y2.

$$Y1 = \alpha 1 + \alpha 1 Yt + \alpha 1 Yt\text{-}k + \beta 1 Y2t\text{-}1 + \mu t$$

$Y2=\alpha 2+\alpha 2Y2t+\alpha 2Y2t\text{-}1+\beta 2Y2t\text{-}1+\mu 2t$

The above equation can be transposed into matrices format as follows:

$$\begin{pmatrix} Y1 \\ y2 \end{pmatrix} = \begin{pmatrix} \propto 1 \\ \propto 2 \end{pmatrix} + \begin{pmatrix} \propto 1Yt \\ \propto 2Y2t \end{pmatrix} + \begin{pmatrix} \propto 1Yt-1 \\ \propto 2Yt-1 \end{pmatrix} + \begin{pmatrix} \propto 1Y2t-1 \\ \propto 2Y2t-2 \end{pmatrix} + \begin{pmatrix} \mu 1 \\ \mu 2 \end{pmatrix}$$

Thus μ1 and μ2 representing white noise disturbance in the equation.

4.6.1.1. Advantages of VAR Modelling

VAR modelling is more valuable in application in comparison to univariate time series models. There is no need for variable specification in running out the analysis. All variables included are treated as endogenous. Simultaneous equations structural models to be estimated in all equations in the system are identified. Essentially, this requirement boils down to a condition that some variables are treated as exogenous and that the equations contain different RHS variables. However, in practice theory will be at best vague in its suggestions of which variables should be treated as exogenous and endogenously. This gives a hint in which variable is being estimated and being compared to. This leaves the researcher with a great deal of discretion concerning how to classify the variables. On the other hand the Hausman-type tests are often not employed in practice when they should be, the specification of certain variables as exogenous, required to form identifying restrictions, is likely in many cases to be invalid. Sims termed these identifying restrictions 'incredible'. VAR estimation, on the other hand, requires no such restrictions to be imposed. Secondly, VAR model depend on more than just own lags or combination of white noise terms, thus makes it flexible than univariate AR models. VAR modelling offers rich structure in sense that it captures more features of the data. It enables the use of ordinary least squares (OLS) separately on each equation. Lastly, the model provides better results on forecasting than traditional structural models.

4.6.1.2. Disadvantages of using VAR Modelling

Though VAR is regarded to be good in forecasting, there some other limitations relative to other estimation tools. VAR is mostly known theoretically as it shows limited correlation between the variables specified in the study. Valid exclusion restrictions that ensure identification of equations from a simultaneous structural system will inform on the structure of the model. Thus VAR provide limited strength to theoretical analysis as well as policy prescriptions. It is as well

indication that it's often not clear how the VAR coefficient estimates should be interpreted. VAR works perfectly provided many parameters are used and all components of the VAR are supposed to be stationary.

4.6.2. Lag structure

This comprises choosing of lags on which the model should base on. There are various ways of choosing lag structure. One of the ways is called Akaike information criteria model. In this model we find that the lower the AIC value the better the model.

4.6.2.1 AR table and AR graph

Autoregressive table and graph simply shows the stationary of the system. That is the corresponding modulus for the roots given must be less than 1 for the system to be stationary. The bigger the modules values in the system the more non-stationary the system comes.

4.6.2.2. Granger-causality and Block Exogeneity test

Brooks (2008) emphasize that granger –causality and block exogeneity test shows since VAR tests consists of many lags of variables, it is difficult to see which sets of variables have significant effects on each dependent variables and which doesn't . In dealing with the scenario mentioned test is conducted that restrict all of the lags of the particular variable to zero. Thus, in a set of equations if change in X1 causes changes in X2, that is lags of X1 should be significant in the equation for X2. If this is the case and not vice versa, it would be noted that X1 granger cause X2 or that there exist unidirectional causality from X1 to X2. If both sets of the equations find to be significant, the results is said to be bi-directional causality or bidirectional feedback. If the variables granger cause but not vice versa it is said variable X1 is strongly exogenous. If neither of the lags are not statistically significant in the equation for the variables, it would be concluded that X1 and X2 are independent. Causality in this study simply means correlation between the current value of one variable and the past value of others.

4.6.2.3. Lag length criteria

There are various lag criteria in testing using VAR model. That is firstly sequential modified LR test statistics which is basically acceptable at 5% of significance level. The final prediction error has to be significant as well. Akaike information criteria and Schwarz information is the most important among all the criterion. That is the criterion is selected based on the autocorrelation of

the values of the smallest values given in the system. So the lag which is corresponded to the smallest value in the system is regarded to be the chosen lag to be used. Lastly the Hannan-Quinn information criterion is also used but not commonly applicable in many studies.

4.6.2.4. Residual tests

4.6.2.4.1. Correlogram

This area shows the partial autocorrelation and autocorrelation functions values up to the number of specified lags. Thus if the correlogram in the system resembles the corellogram of a white noise time series the time series is said to be stationary. This measure simply is commonly used for checking randomness in a data set. The randomness of the data is basically is ascertained by computing autocorrelations for data values at varying time lags. Such autocorrelations are said to be near zero for any and all time-lag separations.

4.6.2.4.2. Autocorrelations LM tests / serial correlation

Autocorrelation is also known as serial correlation or cross-autocorrelation. It is the cross-correlation of a signal with itself at different points in time that is what the cross stands for. Informally, it is the similarity between observations as a function of the time lag between them. This test is an alternative method to the Q-statistics for testing serial correlation. The test belongs to the class of large sample tests known as Lagrange multiplier (LM) tests. Unlike the Durbin-Watson statistic for AR(1) errors, the LM test may be used to test for higher order ARMA errors, and is applicable whether or not there are lagged dependent variables. Therefore, we recommend its use whenever you are concerned with the possibility that your errors exhibit autocorrelation. The null hypothesis of the LM test is that there is no serial correlation up to lag order p, where p is a pre-specified integer. The local alternative is ARMA(r, q) errors, where the number of lag terms $p = \max\{r, q\}$.The alternative includes both AR (p) and MA (p) error processes, and that the test may have power against a variety of autocorrelation structures.

4.6.2.4.3. White heteroscedasticity

Heteroscedasticity is a situation in which the variance of the regression error term conditional on the repressors is not constant, (Stock & Watson, 2012). The White Heteroscedasticity test was

developed by White in 1980, this helps to test for heteroscedasticity in the residuals where least squares estimates are

4.6.3. Cointegration tests

Cointigration basically shows that a combination of two or more series variables makes it stationary. Thus if the individual series are first order integrated (I (1)) but some vector of coefficients exists to form a stationary in linear combination of them. Gujarati (2009) shows that there are two cointegration test methods. That is AD and ADF. Thus both test deals with the relationship among a group of variables where unconditionally each has unit root or non-stationary.

4.6.4. Impulse response and variance decomposition

In this test block F-tests and examination of causality in a VAR will suggest which of the variables in the model will be statistically significant I pacts on the future values of each of the variables in the system. Thus, F-test results will not give more information in explaining the sign of the relationship or how long these effects require to take place. That is, F-test results will not reveal whether changes in the value of a given variable have a positive or negative effect on other variables in the system, or how long it would take for the effect of that variable to work through the system. Such information will, however, be given by an examination of the VAR's impulse responses and variance decompositions. Impulse responses trace out the responsiveness of the dependent variables in the VAR to shocks to each of the variables. So, for each variable from each equation separately, a unit shock is applied to the error, and the effects upon the VAR system over time are noted.

4.6.5. Miscellaneous tests

4.6.5.1. Unit root testing

Unit root testing is basically employed in this study in order to check whether the time series data is stationary or not under the assumption of autoregressive model. Since autoregressive model is defined as the model in which the explanatory variables are lags of the dependent variables.When testing for unit root, the non-stationary time series variables on which we focus on are those time series containing unit root. These time series are the one containing stochastic

trend. Therefore if we difference these time series the resulting time series will be stationary. For this reason we say the time series are differenced stationary.

4.6.5.2. Diagnostic checking

In doing diagnostic tests, the error term *t* statistics is assumed to follow the assumptions of stationary univariate process. The residuals are expected to be white noise that is it has to be independent when their distributions are normal. The process is achieved by drawing conclusions from the fact that the white noise is met if time series mean and variance is constant.

4.6.5.2.1. Normality test

Under this technique histogram and descriptive statistics of the residuals including Jarque-Bera statistics for normality test is used. So if the given residuals are normally distributed, the histogram should be bell-shaped and the Jarque-Bera statistics should not be significant. So the Jarque-Bera statistics has an X^2 distribution with two degrees of freedom under null hypothesis of normally distributed.

4.6. Summery

In this chapter methodology has been explained with regard to VAR model analysis. Estimation technique has been presented and diagnostic estimation technique has applied in order to check whether fiscal policy on economic growth data are normally distributed or does not have serial correlation and heteroscedasticity. Cointegration as well as impulse response and variance decomposition has been used.

CHAPTER FIVE

Results and conclusion

5.1 Introduction

This section comprise of results of this study. The results have been outlined with regard to the VAR requirements. The system stationarity has been shown by unit root test, autoregressive table and graph, correlogram as well as visual unit root graphs.

5.2. VAR Results

The results shown in table 5.1 show the coefficients followed by the standard error and T-value of each variable. The exogenous variables in VAR model is explained by the endogenous variables provided. The results reveal that not all variables are significant to the lagged values of the endogenous variables explained by the coefficient provided in them. VAR results presented in the table below shows that GDP, tax charges on total debts and government expenditure shows not to be significant to either of the coefficients under endogenous variables to explain the endogenous variables. Inflation shows to be significant by the first lag of country's total debts and interest rate charged on borrowing. Secondly in the same period interest rate charged on debts shows to be significant to the second lag of inflation rate. Thus exchange rate is significant to a first lag of gross domestic product. Lastly the country's total debts are significant to the first lag of general tax charges as one of a source of the countries revenue.

Table 5.1: VAR results

		GDP	**INFL**	**LNDTAX**	**LNGOVEX**	**LNINTRATE**	**LNXTRATE**	**LNDEBT**
GDP(-1)	P-value	**0.0353***	0.3921	0.6669	0.3664	0.5660	**0.0501***	0.2391
	T-stat	**-2.1291***	-0.51884	1.86180	0.63332	0.52633	1.02993	0.66047

GDP(-2)	P-value	0.4267	0.4361	0.3710	0.8548	0.4619	0.2768	0.3180
	T-stat	0.85897	1.52307	1.04517	0.30298	0.48731	1.09342	1.16373
INFL(-1)	P-value	0.5842	0.6048	0.9256	0.3522	0.3878	0.8688	0.6555
	T-stat	0.43147	0.09359	-0.66411	0.09154	-0.39242	-0.83838	-0.20283
INFL(-2)	P-value	0.6555	0.0665	0.2413	0.9508	**0.0106***	0.1107	0.1782
	T-stat	-0.90660	-0.93391	-1.25733	-0.71915	-0.49899	-0.21241	-0.61831
LNDTAX(-1)	P-value	0.3559	0.9046	0.0651	0.2981	0.5079	0.2111	**0.0368***
	T-stat	0.57555	-0.86675	**2.11134***	-1.69098	-0.11592	-1.67987	-1.49248
LNDTAX(-2)	P-value	0.2094	0.4585	0.8275	0.6489	0.4867	0.0694	0.8929
	T-stat	-1.97957	0.16556	-1.26210	2.10054	-0.89499	1.38491	-1.17201
LNGOVEX(-1)	P-value	0.3004	0.8273	0.2741	0.5277	0.7624	0.9272	0.4735
	T-stat	1.18330	0.44728	0.74379	0.94928	0.80963	-0.15077	-1.85663
LNGOVEX(-2)	P-value	0.0935	0.0378	0.3444	0.1577	0.3715	0.0908	0.8806
	T-stat	0.7976	1.85176	-0.2184	1.42190	-0.65003	0.85732	-0.27179

		7		5				
LNINTRATE(-1)	P-value	0.9652	**0.0318***	0.2996	0.9556	0.5996	0.6269	0.6955
	T-stat	0.78147	-1.17749	-0.45646	-0.89709	0.48740	-2.08870	-1.77307
LNINTRATE(-2)	P-value	0.6187	0.9079	0.3726	0.4198	0.5169	0.6269	0.4764
	T-stat	-0.89801	-0.06181	0.69774	1.70518	-0.71439	-0.25107	-1.83388
LNXTRATE(-1)	P-value	0.6439	0.6821	0.9796	0.5959	0.2629	0.3051	0.2764
	T-stat	-0.18339	**2.59649***	1.83209	0.15051	-0.46342	**4.27449***	0.23752
LNXTRATE(-2)	P-value	0.4035	0.8322	0.0956	0.1687	0.8804	0.3930	0.0389
	T-stat	0.73806	-1.60714	0.13496	0.04374	0.41067	-0.70643	0.91999
LNDEBT(-1)	P-value	0.8022	**0.0000***	0.4813	0.4964	0.5235	0.7034	0.5102
	T-stat	-1.09243	1.35447	-1.04012	**2.17217***	-0.02556	0.68233	1.90630
LNDEBT(-2)	P-value	0.2469	0.8396	0.5376	0.1382	0.2435	0.0658	0.7863
	T-stat	-1.00279	-0.92686	0.21859	-1.04188	0.53179	0.63981	0.62832

*** indicates significance of the coefficient of the endogenous variable to explain the exogenous variable.**

5.3 Lag Structure

This area comprises the explanation and representation of AR tables and graph with respect to the data available from the year 1981- 2014 on fiscal policy on economic growth in Malawi.

5.4. AR Tables and Graphs

The results under this area show whether the VAR system is stationary or non-stationary. The results in the table below reveals that the Modules corresponding to each root on the table is less than 1 thus providing a sound proof of stationarity.

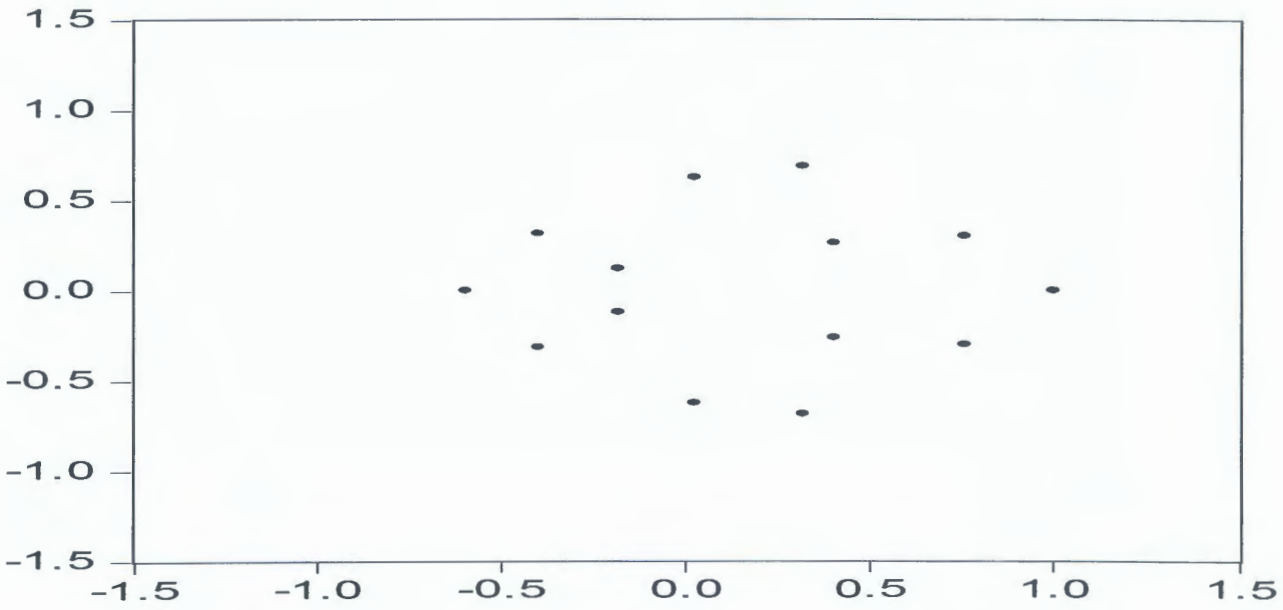
Table 5.2: AR Table results

ROOT	MODULES
1.002953	1.002953
0.761070 - 0.301573i	0.818642
0.761070 + 0.301573i	0.818642
0.319835 - 0.687341i	0.758111
0.319835 + 0.687341i	0.758111
0.025935 - 0.626206i	0.626743
0.025935 + 0.626206i	0.626743
-0.595573	0.595573
-0.398497 - 0.314995i	0.507958
-0.398497 + 0.314995i	0.507958
0.404783 - 0.261560i	0.481936

0.404783 + 0.261560i	0.481936
-0.180721 - 0.121351i	0.217683
-0.180721 + 0.121351i	0.217683

Consequently, the inverse roots of AR characteristic polynomial seems to be scattered within the table circle thus providing the proof of data significance and proof of data stationarity.

Figure 5.1: AR Root graph.



5.6. Granger Causality /Block Exogeneity Test Results

The results in the figure 5.4. Below shows that all null hypothesis in this analysis are accepted at 5% level of significance level. The result shows the existence of short-run causality at the 5% significance in the study. There is causality running from GDP towards inflation and from government expenditure to GDP and tax charged on total debts. This has been followed by causality which runs from debts tax to interest rate charged on debts and exchange rate. Lastly, unidirectional causality runs from exchange rate to tax and interest rate charges. Table 5.3 below shows the aggregate summary of the above block exogeneity test explanation.

Table 5.3: Granger causality results.

Null Hypothesis	**F-Statistics**	**Probability**	**Decision**
INFL does not Granger Cause GDP	1.59483	0.2215	Accept
GDP does not Granger Cause INFL	4.74223	0.0172	Reject
LNDTAX does not Granger Cause GDP	1.42478	0.2581	Accept
GDP does not Granger Cause LNDTAX	0.62506	0.5428	Accept
LNGOVEX does not Granger Cause GDP	3.19781	0.0567	Reject
GDP does not Granger Cause LNGOVEX	0.17100	0.8437	Accept
LNINTRATE does not Granger Cause GDP	0.73597	0.4884	Accept
GDP does not Granger Cause LNINTRATE	1.00505	0.3793	Accept
LNXRATE does not Granger Cause GDP	0.87527	0.4282	Accept
GDP does not Granger Cause LNXRATE	0.33756	0.7165	Accept
LNDEBT does not Granger Cause GDP	0.91726	0.4117	Accept
GDP does not Granger Cause LNDEBT	0.23270	0.7940	Accept
LNDTAX does not Granger Cause INFL	1.16552	0.3270	Accept
INFL does not Granger Cause LNDTAX	1.13814	0.3353	Accept
LNGOVEX does not Granger Cause INFL	1.41262	0.2609	Accept
INFL does not Granger Cause LNGOVEX	0.40993	0.6678	Accept
LNINTRATE does not Granger Cause INFL	0.14111	0.8690	Accept
INFL does not Granger Cause LNINTRATE	0.04258	0.9584	Accept
LNXRATE does not Granger Cause INFL	14.2562	6.E-05	Accept

INFL does not Granger Cause LNXRATE	1.87602	0.1726	Accept
LNDEBT does not Granger Cause INFL	0.86292	0.4332	Accept
INFL does not Granger Cause LNDEBT	0.62543	0.5426	Accept
LNGOVEX does not Granger Cause LNDTAX	3.00717	0.0662	Reject
LNDTAX does not Granger Cause LNGOVEX	1.98779	0.1565	Accept
LNINTRATE does not Granger Cause LNDTAX	0.54365	0.5868	Accept
LNDTAX does not Granger Cause LNINTRATE	4.32138	0.0235	Reject
LNXRATE does not Granger Cause LNDTAX	7.22141	0.0031	Reject
LNDTAX does not Granger Cause LNXRATE	3.28792	0.0527	Reject
LNDEBT does not Granger Cause LNDTAX	1.52422	0.2359	Accept
LNDTAX does not Granger Cause LNDEBT	0.13432	0.8749	Accept
LNINTRATE does not Granger Cause LNGOVEX	0.89345	0.4210	Accept
LNGOVEX does not Granger Cause LNINTRATE	1.88774	0.1709	Accept
LNXRATE does not Granger Cause LNGOVEX	1.02249	0.3732	Accept
LNGOVEX does not Granger Cause LNXRATE	0.22499	0.8000	Accept
LNDEBT does not Granger Cause LNGOVEX	2.18118	0.1324	Accept
LNGOVEX does not Granger Cause LNDEBT	0.62409	0.5433	Accept
LNXRATE does not Granger Cause LNINTRATE	3.15050	0.0589	Reject
LNINTRATE does not Granger Cause LNXRATE	2.20364	0.1299	Accept
LNDEBT does not Granger Cause LNINTRATE	0.99988	0.3811	Accept
LNINTRATE does not Granger Cause LNDEBT	0.26696	0.7677	Accept

LNDEBT does not Granger Cause LNXRATE	0.52603	0.5969	Accept
LNXRATE does not Granger Cause LNDEBT	1.27268	0.2964	Accept

Numbers of lags (2) and 32 observation were used. 10% significance level

5.7 Lag Length Criteria

The study opted lag 2 as a significant lag structure of the study. The lag was chosen by following sequential modified LR test at 5% significant level. Final prediction error shown the same lag structure as well as Akaike information criteria and Schwarz information criteria. Lastly Hannan –Quine information criteria showed the same lag structure. Figure below shows the summery of lag structure chosen in this study.

Table 5.4: Lag structure.

Lag	**LR**	**FPE**	**AIC**	**SC**	**HQ**
1	NA	0.035723	16.53303	16.53302	16.63930
2	259.1257*	1.69*	8.798618*	11.36366*	9.648855*
3	48.51148	3.36	9.007501	13.81695	10.60170

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

5.8 Residual Tests Results

5.8.1. Corellogram

In testing correlation within the variables, VAR cross-correlations analysis was used based on the lags of the system. As indicated in the results lag 2 was opted in and then we fail to reject the null hypothesis of no correlation in the residuals given. In this study corellogram presentation below is trying to shed light on whether the data used in this study are auto correlated. Thus partial autocorrelation shows the correlations between the variables given with its lag values. With regard to the results given in the table below the endogenous variable are positively correlated while others show negative correlations with the exogenous variables given. Full information based on the results was given in the table below.

Table 5.5: Corellogram results

	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LN
GDP	1.000000	-0.222190	0.181400	-0.411893	0.358754	-0.221737	0.2
INFL	-0.222190	1.000000	0.156714	-0.039938	-0.088453	0.712668	-0.0
LNDTAX	0.181400	0.156714	1.000000	-0.438097	0.110513	0.033417	-0.0
LNGOVEX	-0.411893	-0.039938	-0.438097	1.000000	-0.058253	-0.001261	0.0
LNINTRATE	0.358754	-0.088453	0.110513	-0.058253	1.000000	-0.259373	-0.2
LNXRATE	-0.221737	0.712668	0.033417	-0.001261	-0.259373	1.000000	-0.1
LNDEBT	0.214900	-0.008850	-0.081197	0.066638	-0.235918	-0.191193	1.0
GDP(-1)	-0.068478	-0.001737	-0.237809	0.201552	-0.132922	-0.005640	0.0
INFL(-1)	0.307139	-0.108429	0.229617	-0.051151	0.210025	-0.161478	0.0
LNDTAX(-1)	0.160869	-0.061496	-0.051475	-0.027731	-0.075719	-0.247331	0.0
LNGOVEX(-1)	0.151596	-0.110468	0.207563	-0.282827	0.259584	-0.105399	-0.0
LNINTRATE(-1)	0.017772	0.064057	-0.041157	0.001009	-0.058274	0.012529	0.0
LNXRATE(-1)	0.127446	-0.052931	0.305533	-0.173233	0.191579	-0.097408	-0.1
LNDEBT(-1)	-0.083706	0.091131	-0.069888	0.058600	-0.062109	0.047196	-0.0

GDP(-2)	-0.074729	-0.103953	-0.079416	-0.109235	-0.008888	0.053659	-0.0
INFL(-2)	-0.032204	-0.117133	-0.139130	0.150918	-0.198619	-0.099451	0.2
LNDTAX(-2)	0.231786	-0.113891	-0.016308	-0.127040	0.346206	-0.039115	0.0
LNGOVEX(-2)	-0.057902	0.133365	0.078057	0.014826	-0.185110	-0.069592	0.0
LNINTRATE(-2)	0.073870	-0.098825	0.096889	-0.048324	-0.179710	-0.087473	0.0
LNXRATE(-2)	-0.195551	0.119789	-0.039277	0.097930	-0.172265	0.133818	0.0
LNDEBT(-2)	-0.011162	0.047483	0.158278	-0.007207	-0.183278	0.079014	-0.0

5.8.2 Autocorrelation / Serial Correlation Test

The results under autocorrelation or serial correlation show positive results. Since two lags were opted in this analysis the first and second probabilities has not been displayed as such * sign has been indicated on those areas. We fail to reject the null hypothesis in this case as all probability values are less than 5% level of significance. Thus, the result proves the absence of serial correlation in the data set.

Table 5.6: VAR Residual Portmanteau Tests for Autocorrelations results.

LAGS	Q-STAT	PROBABILITY	ADJ Q-STAT	PROBABILITY

1	26.14108	NA*	26.98434	NA*
2	60.38084	NA*	63.50675	NA*
3	104.3824	0.0000	112.0602	0.0000
4	148.0630	0.0008	161.9809	0.0001
5	189.7471	0.0101	211.3842	0.0004
6	229.1604	0.0524	259.8930	0.0015
7	265.7648	0.1729	306.7465	0.0045
8	319.7679	0.1445	378.7507	0.0006
9	356.4074	0.2978	429.7275	0.0010
10	381.1936	0.6427	465.7800	0.0060
11	403.5906	0.8988	499.9088	0.0272
12	425.9062	0.9831	535.6137	0.0756

VAR residual serial correlation results shows to be significant. The p-values under this test is smaller than the significant level of 5%. Thus we fail to reject the null hypothesis of no serial correlation in the VAR model. This result tells us that the first of order of the VAR model is significant up to the 12th order. Table 5.7 below shows the

Table 5.7: Serial correlation results

Lag	**LM-statistics**	**P-value**

1	65.74256	0.0553
2	44.50489	0.6557
3	67.09531	0.0439
4	35.80820	0.9202
5	60.03370	0.1342
6	57.22027	0.1964
7	66.05695	0.0525
8	74.53899	0.0108
9	83.77011	0.0014
10	78.66625	0.0046
11	46.50790	0.5747
12	53.03121	0.3215

5.8.3 White Heteroscedasticity

Under this test, the probability value is significant at 5% level of significance. Therefore we reject the null hypothesis of homoscedasticity. The VAR model follows heteroscedasticity standard.

Table 5.8: White heteroscedasticity results

Chi-square	**Probability**
807.5410	0.2724

5.8.4. Cointegration

In this test, we reject the null hypothesis of no cointegration in the VAR MODEL. Thus the significance of the P-values under trace and Eigenvalue statistics has been seen to be cointegrated of order. The cointegration results have been tested by the Johansen's Trace and Maximum Eigenvalue test. The trace test indicates the existence of one cointegration equation at 5%. The maximum eigenvalue test makes the confirmation of these results. Thus the seven variables of this study have long-run equilibrium relationship between them.

Table 5.9: Cointegration results

Hypothesized number of cointegrating equations	**Eigen value**	**Trace statistics**	**Critical value at 5% (p-value)**	**Maximum Eigen statistics**	**Critical value at 5% (p-value)**
P=0*	0.938330	274.3751	125.6154(0.0000)	86.36464	46.23142(0.0000)
p≤1*	0.891740	188.0105	95.75366(0.0000)	68.91978	40.07757(0.0000)
p≤2*	0.782656	119.0907	69.81889(0.0000)	47.31451	33.87687(0.0007)
p≤3*	0.723275	71.77622	47.85613(0.0001)	39.82672	27.58434(0.0008)
p≤4*	0.553641	31.94950	29.79707(0.0278)	25.00556	21.13162(0.0135)
p≤5	0.200407	6.943936	15.49471(0.5842)	6.933238	14.26460(0.4971)
p≤6	0.000345	0.010699	3.841466(0.9173)	0.010699	3.841466(0.9173)

* denotes rejection of the hypothesis at the 0.05 level.

5.8.5. Impulse Response

An impulse response refers to the reaction of any dynamic system in response to some external change. In both cases, the impulse response describes the reaction of the system as a function of time or possibly as a function of some other independent variable that parameterizes the dynamic behaviour of the system. In this case the impulse response function may show positive or negative reaction depending on the period lag given. The results given below shows how the change of standard deviation of one variable will affect other variables in the period of ten years since this study has used annual time series data.

Table 5.10: GDP impulse response results

Response of GDP:							
Period	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	4.138507	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	-2.411974	0.202051	0.492870	0.956324	1.544616	0.223819	-0.872656
3	0.776870	-0.617651	-2.485031	0.836797	-1.619824	1.316079	-0.327047
4	-1.319858	-0.304995	-0.442241	0.524176	1.611594	-0.701001	0.334833
5	0.556125	-0.250858	0.054979	0.785964	0.066961	-0.391870	0.135720
6	-0.057965	0.105173	0.461071	-0.029727	-0.042483	-0.593130	0.542058
7	0.609513	-0.333806	-0.049020	0.053196	0.049082	0.285408	-0.188318
8	-0.087941	-0.213448	-0.221558	-0.001051	0.100654	0.080946	-0.159800
9	-0.159184	0.071272	-0.145526	0.031473	0.200016	0.135269	-0.088960
10	-0.135395	0.180017	-0.025713	-0.010867	0.007412	0.042283	0.057396

The table 5.9 above clearly shows that a shock in GDP shows positive reactions on the first, third, fifth and seventh period. It is expected to show negative reactions in the second, fourth, sixth, eighth, ninth and tenth period under GDP trend. A change in INFL which if the inflation rate in the period show no any reaction in the first period on GDP. Thus positive results were seen in the second, sixth, ninth and tenth period the rest of the periods under inflation shows to be negatively towards GDP. An impulse on LNDTAX, that is the aggregate tax collect in the economy, will affect GDP growth positively in the second, fifth and sixth. Any external shock to LNGOVEX, which government expenditure in the economy will affect GDP from first to fifth period, seventh and eighth period. A negative impact from government expenditure is noticed in period six, eight and ten. Any external shock on LNINTRATE, which is the interest rate charged on debts, will affect GDP negatively on the third and sixth period keeping the rest of the period's positive. An impulse applied on LNXRATE, which is the aggregate exchange rate will affect

GDP negatively in the period four, five and six, resulting into positive outcome in the rest of the periods. Lastly, a shock in LNDEBTS, which represents the aggregate domestic and external borrowing gin the economy will only affect the GDP negatively on the second, third, seventh, eighth and ninth period.

Table 5.11: INFL impulse response results

Response of INFL:							
Period	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	-2.081991	9.136111	0.000000	0.000000	0.000000	0.000000	0.000000
2	-4.623129	4.856496	-3.727199	0.471761	-6.253175	3.960149	2.449789
3	0.293933	-2.626633	-7.973230	0.469850	-9.756624	1.174691	1.601132
4	-4.129732	-0.642647	-1.392138	0.229776	-2.901321	-3.609677	2.105937
5	-2.107994	2.182030	1.306897	-0.000306	-2.239513	-1.274445	0.671546
6	-0.610046	1.749694	1.140711	-0.623558	-1.748220	0.112452	0.666016
7	0.956434	-0.617803	0.060113	0.297534	-0.635807	0.435578	-0.353170
8	0.166971	-0.978858	-0.003010	0.751685	0.480875	-0.453530	-0.349703
9	0.033692	-0.458753	0.195384	0.826253	1.481381	-0.266273	-0.359884
10	0.376563	-0.441220	0.120580	0.742017	1.507941	-0.099854	-0.246940

In the table 5.10 above shows the response to inflation rate can have if one of the endogenous variables gets to be shocked. Thus an impulse to GDP caused inflation rate to respond positively in the first sixth period leaving the other four periods being negatively related. A shock to inflation rate itself causes it to respond positively only four periods that are first, second, fifth and sixth period. The rest showed to be negatively affected. A change in tax charges might cause inflation rate to respond negatively in the period two, three, four and eighth. The rest shows to respond positively. Government expenditure shock causes inflation rate to respond negatively on two periods, that is period five and six respectively. Similarly a shock to interest rate on debts shows to respond negatively except in the period eight, nine and ten. Exchange rate has a negative response on the period four, five, eight, nine and ten. Lastly, government debts have positive effect in the first six periods and negatively in the last four periods in the process.

Table 5.12: LNDTAX impulse response results

Response of LNDTAX:							
Period	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	0.032543	0.036252	0.172661	0.000000	0.000000	0.000000	0.000000
2	0.055550	0.057180	0.093508	0.012738	-0.031387	0.083649	-0.036018

3	0.025109	0.036076	-0.028952	0.026993	-0.022513	0.134697	-0.029822
4	-0.013550	0.016758	-0.104167	0.047704	-0.048862	0.118685	-0.015349
5	-0.058890	0.052141	-0.101770	0.032738	-0.105588	0.073949	0.034840
6	-0.067636	0.087398	-0.082583	0.002866	-0.167231	0.068227	0.058405
7	-0.069511	0.101321	-0.080427	-0.024099	-0.230205	0.077372	0.063520
8	-0.085142	0.110726	-0.084556	-0.039220	-0.263891	0.086511	0.058587
9	-0.103725	0.124829	-0.085738	-0.042980	-0.277818	0.092775	0.054227
10	-0.112808	0.136160	-0.082597	-0.040735	-0.285053	0.093862	0.056086

In the table 5.11 shows the results on an impulse on tax charges. If GDP is shocked, tax charges is going to be affected positively in the first three periods. A change in inflation rate results into positive response on tax charges. A shock in government expenditure results into negative results in the last four periods. Tax has shown negative results in response to change in interest rate charges on debts. Alternatively, tax is positively related to exchange rate shock. Thus lastly, a shock in debts resulted into negative results in the first four periods.

Table 5.13: LNGOVEX impulse response results

Response of LNGOVEX:							
Period	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	-0.021844	-0.007150	-0.018522	0.044059	0.000000	0.000000	0.000000
2	-0.002439	-0.002790	-0.033993	0.011063	-0.026580	-0.008050	0.022236
3	-0.003908	-0.009425	-0.010022	0.007407	0.007953	-0.006903	0.008218
4	-0.000115	-0.004007	-0.006530	0.002782	-0.016718	-0.006183	0.003944
5	-0.009271	0.007733	0.001062	-0.006347	-0.008119	-0.001949	0.005689
6	-0.001517	0.005249	-0.001885	-0.003661	-0.007916	0.006792	-0.001689
7	-0.004474	0.004571	-0.001928	-0.003125	-0.010367	0.001990	0.001865
8	-0.003110	0.004117	-0.000589	-0.001585	-0.007654	0.001630	0.001489
9	-0.002539	0.003511	-0.000499	-0.000879	-0.007375	0.001364	0.001379
10	-0.001790	0.002496	-0.001032	-0.000349	-0.006114	0.001663	0.001099

In the table 5.12 above shows the response to government expenditure if either of the independent variables. A shock to GDP affect government expenditure negatively both in short and long-run. Inflation rate shock affects government expenditure positively in the last six periods. Thus a change in interest rate charged on debts affects government expenditure positively only two periods, that is first and third period respectively. Exchange rate affects government expenditure negatively in the first five periods and only period six under debts.

Table 5.14: LNINTRATE impulse response results

Response of LNINTRATE:							
Period	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	0.105114	-0.002627	0.014384	0.037191	0.270558	0.000000	0.000000
2	0.049207	-0.065904	-0.023072	0.053407	0.057975	-0.027435	-0.001446
3	0.029146	-0.057791	-0.054677	-0.012932	-0.029789	-0.038894	0.033658
4	-0.019684	-0.025008	-0.009734	-0.025731	0.049487	-0.022838	-0.010584
5	-0.014952	0.010966	0.009743	-0.026986	0.007275	-0.015100	-0.006996
6	-0.011089	0.020397	0.030133	-0.032930	0.008259	-0.018901	0.005636
7	0.017733	-0.003874	0.028203	-0.019474	0.006776	-0.014931	-0.004935
8	0.013746	-0.016359	0.026376	-0.010943	0.020243	-0.023066	-0.008238
9	0.014820	-0.020779	0.023708	-0.001022	0.045061	-0.018827	-0.016173
10	0.016896	-0.024341	0.021860	0.006328	0.061005	-0.019443	-0.017309

In the table 5.13 shows the results on interest rate if one of the variables get shocked in the process. I t has been shown that a change in GDP will affect interest rate charged on debts positively except period four, five and six where the response. Inflation rate shock results into positive results in the period five and six. Tax to tax response shows to be negatively related in the second, third and fourth period leaving behind the rest into negative response. A shock to exchange rate leaves interest rate into negative response. An impulse to debts results into positive results in interest rate in the period three and six respectively.

Table 5.15: LNXRATE impulse response results

Response of LNXRATE:							
Period	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	-0.035974	0.110388	-0.010763	-0.004692	-0.029305	0.108834	0.000000
2	-0.050008	0.099725	-0.098704	-0.023532	-0.165933	0.134018	0.021367
3	-0.066073	0.082399	-0.113508	-0.029334	-0.222527	0.093612	0.054838
4	-0.100933	0.109171	-0.083611	-0.036397	-0.251630	0.066859	0.061381
5	-0.107691	0.139487	-0.069603	-0.049407	-0.283867	0.078704	0.066045
6	-0.104658	0.138641	-0.072929	-0.050159	-0.291969	0.092359	0.058821
7	-0.102867	0.128075	-0.077711	-0.039619	-0.292319	0.090220	0.054818
8	-0.106645	0.125423	-0.074228	-0.029584	-0.279761	0.083267	0.054600
9	-0.101292	0.121993	-0.071816	-0.020678	-0.267126	0.082338	0.053383
10	-0.094230	0.114228	-0.072266	-0.013777	-0.256646	0.080853	0.052555

In the table above 5.14 above a shock in GDP results into negative response to exchange rate in all periods. Thus a shock in inflation rate, interest rate charged on debts and total debts in the economy results into positive response to exchange rate in the economy. On contrary, negative results is noticed on shocking of GDP, tax, government expenditure and interest rate charges on debts.

Table 5.16: LNDEBT impulse response results

Response of LNDEBT:							
Period	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	0.046916	0.008710	-0.029090	0.029956	-0.076490	-0.077731	0.178181
2	0.025484	-0.001092	-0.080338	-0.083419	-0.172351	-0.024326	0.080331
3	-0.058433	0.035357	-0.083310	-0.114359	-0.198904	0.032514	0.035335
4	-0.132502	0.104120	-0.057025	-0.115395	-0.186180	0.043777	0.009295
5	-0.116025	0.137624	-0.010549	-0.096286	-0.185470	0.034068	0.033561
6	-0.068213	0.107103	0.017847	-0.068677	-0.180258	0.013992	0.039380
7	-0.029870	0.058158	0.019113	-0.040211	-0.155334	0.003315	0.029017
8	-0.023411	0.026282	0.009630	-0.014427	-0.093798	0.005127	0.006233
9	-0.019644	0.011254	-0.001028	0.008427	-0.036428	0.010004	-0.007527
10	-0.011713	0.001798	-0.003354	0.022998	0.001627	0.005009	-0.006580
Cholesky Ordering: GDP INFL LNDTAX LNGOVEX LNINTRATE LNXRATE LNDEBT							

In the table 5.15 above, shows the results on total debts when one of the variables are changed. A shock in GDP, results positive results on total debts in the first and second periods only. A shock in inflation rate results in positive results in total debts except period two. Tax charges shock shows to have positive influence on total debts in period six, seven and eight. A change in government expenditure causes total debts to respond positively in the first, ninth and tenth period. Interest rate shock causes total debts to respond positively only in the tenth period. An impulse in exchange rate results into negative response to debts in the first two periods and thus similarly any external shock to total debts affects itself in the last two periods.

5.8.6. Variance Decomposition

The variance decomposition indicates the amount of information each variable contributes to the other variables in the auto-regression. It determines how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables. That is how much the shock or change in endogenous variables is going to cause the exogenous variable to fluctuate in a given period of time. The interpretation in this area are based on period three in the

short-run and period ten in the long-run. Cholesky order of variables has been used in this results presentation. The tables given under this test shows the aggregate results of such decomposition.

Table 5.17: GDP Variance decomposition results

Variance Decomposition of GDP:								
Period	S.E.	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	4.138507	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	5.228826	83.92222	0.149319	0.888499	3.345045	8.726352	0.183225	2.785335
3	6.297944	59.36951	1.064735	16.18164	4.071152	12.63023	4.493130	2.189606
4	6.720881	55.98910	1.140883	14.64212	4.183166	16.84052	5.033320	2.170899
5	6.807325	55.24356	1.247892	14.27913	5.410667	16.42521	5.237682	2.155864
6	6.871317	54.22651	1.248185	14.46466	5.312229	16.12452	5.885688	2.738213
7	6.915381	54.31450	1.465330	14.28594	5.250665	15.92472	5.981255	2.777585
8	6.925828	54.16689	1.555895	14.34521	5.234838	15.89784	5.976884	2.822448
9	6.934400	54.08576	1.562615	14.35380	5.223964	15.94176	6.000169	2.831933
10	6.938483	54.06019	1.628089	14.33829	5.218062	15.92311	5.996822	2.835443

In the table 5.16 above shows the results on GDP variance decomposition. The results portray outcomes on the shot-run and long-run of the variation in the endogenous variables. In the first quarter, that is period three an innovation to GDP will results into 59.4% fluctuations in GDP itself and 54.06 in the long-run. Thus innovations to inflation rate will results into 1.06% in GDP and 1.62 in the long-run. Tax charges amendment will results into 16.1% in GDP fluctuations and 14.3% in the long-run and government expenditure might cause GDP to fluctuate by 4.07% followed by 5.22% in the long-run. Interest rate adjustment might cause GDP to fluctuate by 12.6% and 15.92% in the long-run. Changes in exchange rate will cause GDP to fluctuate by 4.49% and 5.99% in the long-run. Lastly, adjustment to debts rules will cause GDP to fluctuate by 2.19% in the short-run and 2.84% in the long-run.

Table 5.18: INF Variance decomposition results

Variance Decomposition of INFL:								
Period	S.E.	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	9.370337	4.936820	95.06318	0.000000	0.000000	0.000000	0.000000	0.000000
2	14.41052	12.37967	51.55180	6.689688	0.107173	18.82963	7.552031	2.890002
3	19.43134	6.831561	30.18014	20.51619	0.117411	35.56728	4.518993	2.268435
4	20.56497	10.13177	27.04218	18.77491	0.117307	33.74450	7.115434	3.073897
5	20.99813	10.72588	27.01785	18.39567	0.112518	33.50415	7.193267	3.050665
6	21.20277	10.60262	27.17982	18.33172	0.196847	33.54036	7.057895	3.090731

7	21.25241	10.75568	27.13751	18.24700	0.215528	33.47338	7.066972	3.103926
8	21.30200	10.71181	27.22246	18.16214	0.339044	33.36867	7.079436	3.116441
9	21.37996	10.63408	27.07035	18.03828	0.485928	33.60586	7.043414	3.122090
10	21.45575	10.58989	26.92173	17.91423	0.602104	33.86281	6.995909	3.113319

In the table 5.17 above a change in GDP in the short-run lead to inflation fluctuation by 6.8% in the first quarter and 10.5% in the long-run. Thus a shock to inflation itself in the short-run might lead to 30.2% in fluctuations and 26.92% in the long-run. That is decomposition in tax charges leads to fluctuations of 20.52% in the short-run and 17.91% in the long-run. An innovation in government expenditure might lead to fluctuations of about 0.12% in the short-run and 0.60% in the long-run. An adjustment in interest charges on government debts might lead to fluctuations of about 35.57% in the short-run and 33.86% in the long-run. Similarly, exchange rate adjustment caused inflation rate to fluctuate by 4.52% in the short-run and 6.99% in the long-run. Lastly, a change in government debts might cause inflation rate to fluctuate by 2.27% in the short-run and 3.11% in the long-run.

Table 5.19: LNDTAX Variance decomposition results

Variance Decomposition of LNDTAX:								
Period	S.E.	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	0.179402	3.290597	4.083254	92.62615	0.000000	0.000000	0.000000	0.000000
2	0.238172	7.306946	8.080515	67.96801	0.286040	1.736629	12.33495	2.286910
3	0.282425	5.986886	7.378307	49.38762	1.116879	1.870472	31.51848	2.741357
4	0.331759	4.505529	5.602236	45.65009	2.877002	3.524711	35.63970	2.200725
5	0.381459	5.791304	6.105900	41.64737	2.912700	10.32797	30.71592	2.498826
6	0.447867	6.481846	8.237541	33.61247	2.117069	21.43468	24.60305	3.513344
7	0.534553	6.240969	9.375166	25.85851	1.689347	33.59229	19.36548	3.878249
8	0.628092	6.358049	9.898483	20.54238	1.613564	41.98423	15.92409	3.679202
9	0.720257	6.908920	10.53101	17.03850	1.583131	46.80508	13.76867	3.364688
10	0.807296	7.452057	11.22728	14.60930	1.514766	49.72412	12.31156	3.160917

In this table 5.18 above shows the results on variation in TAX changes due to innovation in the endogenous variables. Thus an innovation in gross domestic product (GDP) might cause the tax to fluctuate by 5.99% in the short-run and 7.45% in the long-run. Inflation rate adjustment might cause tax to be fluctuated by 7.38% in the short-run and 11.23% in the log-run. Adjustment to government expenditure might cause tax collected to fluctuate by 1.12% in the short-run and 1.51% in the long-run. Interest rate charged on debts adjustment might cause tax to be adjusted

by 1.87% in the short-run and 49.72% in the long-run. Exchange rate adjustment account for 31.52% fluctuation in tax in the short-run and 12.31% in the long-run. Lastly, government debts adjustments accounts for 2.74% fluctuations in tax in the short-run and 3.16% in the long-run.

Table 5.20: LNGOVEX Variance decomposition results

Variance Decomposition of LNGOVEX:								
Period	S.E.	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	0.053034	16.96559	1.817809	12.19814	69.01847	0.000000	0.000000	0.000000
2	0.073280	8.996721	1.097072	27.90717	38.42865	13.15626	1.206846	9.207273
3	0.076209	8.581410	2.543988	27.53282	36.47617	13.25337	1.936401	9.675849
4	0.078788	8.029039	2.638830	26.44692	34.25200	16.90235	2.427519	9.303344
5	0.080602	8.994598	3.441686	25.28682	33.34719	17.16448	2.377918	9.387309
6	0.081579	8.815037	3.773718	24.73811	32.75459	17.69746	3.014413	9.206677
7	0.082610	8.889675	3.986321	24.17886	32.08512	18.83314	2.997632	9.029261
8	0.083171	8.910093	4.177766	23.85902	31.69034	19.42701	2.995782	8.939997
9	0.083638	8.902995	4.307481	23.59672	31.34826	19.98797	2.989002	8.867580
10	0.083948	8.882795	4.364101	23.43782	31.11879	20.37098	3.006182	8.819332

Table 5.19 above shows the decomposition of government expenditure with regard to innovations to the endogenous variables. The innovation made to GDP results into 8.58% din government expenditure in the short-run and 8.88% in the long-run. An innovation or adjustment to inflation rate may cause government expenditure to fluctuate by 2.54% in the short-run and 4.36% in the long-run. Tax adjustment in this results shows that government will be fluctuated by 27.53% in the short-run and 31.11% in the long-run. Interest rate innovations will cause government expenditure to fluctuate by 36.48% in the short-run and 31.12% in the long-run. Exchange rate reform might cause government expenditure to fluctuate by 1.94% in the short-run and 3.00% in the long-run. Lastly, government debts adjustment leads government fluctuations by 9.68% in the short-run and 8.82% in the long-run.

Table 5.21: LNINTRATE Variance decomposition results

Variance Decomposition of LNINTRATE:								
Period	S.E.	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	0.292997	12.87043	0.008038	0.240998	1.611191	85.26935	0.000000	0.000000
2	0.316406	13.45511	4.345369	0.738358	4.230733	76.47653	0.751809	0.002088
3	0.333154	12.90164	6.928509	3.359460	3.966719	69.78005	2.041057	1.022569
4	0.340358	12.69570	7.178153	3.300541	4.372114	68.97124	2.405809	1.076436

5	0.342550	12.72428	7.189059	3.339337	4.936982	68.13651	2.569423	1.104415
6	0.346885	12.51044	7.356240	4.010996	5.715566	66.50089	2.802484	1.103382
7	0.349466	12.58383	7.260270	4.603253	5.941971	65.55982	2.943779	1.107082
8	0.352715	12.50492	7.342220	5.078044	5.929244	64.68681	3.317443	1.141321
9	0.358147	12.29973	7.457836	5.363402	5.751581	64.32265	3.493933	1.310875
10	0.366148	11.98101	7.577397	5.487990	5.532833	64.31820	3.624881	1.477690

Table 5.20 conveys results on interest rate decomposition in interest rate in response to change in the endogenous variables. GDP accounts to 12.90% in interest rate fluctuation in the short-run and 11.98% in the long-run. An innovation to inflation rate will results into 6.93% fluctuation in interest rate in the short-run and 7.58% in the long-run. An adjustment to tax charges results into 3.36% fluctuation in interest rate in the short-run and 3.49% in the long-run. Adjustment to government expenditure may results into 3.97% fluctuations in interest rate in the short-run and 5.53% in the long-run. Thus an interest rate own shock results into 69.78% fluctuations in the short-run and 64.31% in the long-run. An adjustment to exchange rate results to fluctuations interest rate by 2.04% in the short-run and 3.62% in the long-run. Lastly, debts reform may cause interest rate to be affected by 1.02% in the short-run and 1.48% in the long-run.

Table 5.22: LNXRATE Variance decomposition results

Variance Decomposition of LNXRATE:								
Period	S.E.	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	0.162238	4.916724	46.29558	0.440148	0.083642	3.262710	45.00120	0.000000
2	0.308244	3.994120	23.29185	10.37565	0.605962	29.88236	31.36954	0.480520
3	0.425679	4.503551	15.96012	12.55080	0.792611	42.99650	21.28488	1.911539
4	0.532146	6.479322	14.42139	10.49977	0.974983	49.87242	15.19845	2.553656
5	0.642383	7.256792	14.61145	8.379319	1.260612	53.75156	11.93081	2.809457
6	0.740203	7.464665	14.51291	7.281677	1.408633	56.04202	10.54265	2.747449
7	0.824068	7.580819	14.12473	6.764260	1.367654	57.79873	9.704611	2.659195
8	0.894851	7.849263	13.94308	6.424554	1.269148	58.79060	9.095921	2.627440
9	0.955234	8.012701	13.86703	6.203224	1.160629	59.41304	8.725305	2.618073
10	1.007461	8.078293	13.75209	6.091276	1.062115	59.90225	8.488177	2.625792

Table above 5.21 highlights the results on the exchange rate variations in response to change in endogenous variables in the chain. GDP adjustment accounts to 4.5% fluctuations in exchange rate and 1.01% in the long-run. Inflations rate amendments causes exchange rate to fluctuate by 15.96% in the short-run and 13.75% in the long-run. Tax rate changes may results into fluctuations to exchange rate by 12.55% in the short-run and 6.09% in the long-run. Government

expenditure changes results into 0.79% fluctuations in the short-run and 1.06% in the long-run. A reform to interest rate results into 43.00% fluctuation in exchange rate in the short-run and 60% in the long-run. Exchange rate own reform results into variation of 21.28% in the short-run and 8.49% in the long run. Lastly, government debts reform may cause exchange rate to fluctuate by 1.91% in the short-run and 2.62% in the long-run.

Table 5.23: LNDEBT Variance decomposition results

Variance Decomposition of LNDEBT:								
Period	S.E.	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
1	0.218317	4.618202	0.159170	1.775519	1.882805	12.27557	12.67684	66.61189
2	0.313807	2.894688	0.078249	7.413430	7.977724	36.10616	6.736530	38.79322
3	0.406235	3.796327	0.804212	8.629430	12.68526	45.51897	4.660447	23.90535
4	0.496647	9.657773	4.933158	7.091903	13.88566	44.50756	3.895044	16.02891
5	0.570201	11.46729	9.568028	5.414487	13.38579	44.34572	3.311948	12.50674
6	0.616869	11.02062	11.18959	4.709929	12.67650	46.42864	2.881228	11.09349
7	0.641690	10.40122	11.16213	4.441328	12.10748	48.76616	2.665313	10.45637
8	0.649745	10.27474	11.05069	4.353854	11.85844	49.64850	2.605861	10.20791
9	0.651335	10.31562	11.02667	4.332877	11.81736	49.71923	2.616748	10.17150
10	0.651912	10.32965	11.00793	4.327860	11.92092	49.63192	2.618023	10.16369
Cholesky Ordering: GDP INFL LNDTAX LNGOVEX LNINTRATE LNXRATE LNDEBT								

In the table 5.22 above shows the results on the decomposition of government debts resulting from the innovations done to the endogenous variables presented in the table above. A reform in GDP results into fluctuations in GDP by 3.80% in the short-run and 10.33% in the long-run. Similarly, an innovation in inflation rate may results into debts fluctuations by 0.80% in the short run of period three and 11.01% in the long-run in period ten. Tax reform causes debts to fluctuate by 8.63% in the short-run and 4.33% in the long-run. Government expenditure according to the results above, May leads total governments debts to fluctuate by 12.68% in the short-run and 11.92% in the long-run. A change in interest rate may results into 45.52% fluctuations in total government debts and 49.63% in the long-run. Exchange rate reform results into 4.66 fluctuations in debts and 2.62% in the long-run. Lastly, debts own shock results into 23.90% fluctuations in the short-run and 10.16% in the long-run in period three and ten respectively.

5.8.7. Unit Root Test

The main concern of this is firstly to determine the order of integration of each of the seven variables used in this study. Philips-perron and Augmented Dickey-Fuller unit root test has been applied and the results of those particular tests have been presented in table 5.10 below. It has been shown clear that the null hypothesis of non-stationary for all the time series being rejected at level, first and second in other variables. The rejected has been opted since the ADF test statistic value are less that the critical value at 1%,5% and 10% level of significance in all stages. Therefore the variables used in this study are stationary and integrated of order I (0), I (1) and I (2).

Table 5.24: Unit root test results

		\ Philips-Perron Test			Augmented Dickey Fuller Test		
Order f integration	Variable	Intercept	Trend and intercept	None.	intercept	Trend and intercept	None.
Level	LGDP	-7.496503***	-8.647202***	-5.066184***	-7.589862***	-7.822727***	-1.917971*
1st Diff.	DGDP	-44.94108***	-46.24231***	-34.17599***	-12.98934***	-12.77869***	-13.18120***
2nd Diff.	DGDP	-64.33696***	-76.00130	-64.52730***	-8.632781***	-8.505944***	-8.791344***
Level	LLNGOVEX	-	-	1.098853	-	-	0.453147

		3.009477 **	3.961039 *		3.117270 **	3.961039	
1st Diff.	DLNGOVEX	-12.90319 ***	-12.72859 ***	-10.94862 ***	-8.340720 ***	-8.200574 ***	-8.432733 ***
2nd Diff.	DLNGOVEX	-49.94428 ***	-49.69462 ***	-50.92283 ***	-7.670133 ***	-7.515055 ***	-7.515055 ***
Level	LINFL	-3.263512 **	-3.220100	-1.457478	-3.369439 **	-3.344606 *	-0.728208
1st Diff.	DINFL	-11.85887 ***	-11.84594 ***	-12.04409 ***	-7.078512 ***	-6.957877 ***	-7.192680 ***
2nd Diff	DINFL	-18.18227 ***	-17.74829 ***	-18.63477 ***	-6.419790 ***	-6.287978 ***	-6.541890 ***
Level	LLNINTRATE	0.507069	-3.522744 *	-3.211861 ***	1.050554 ***	-3.626476 **	-1.583182 **
1st Diff.	DLNINTRATE	-7.050507 ***	-8.857752 ***	-5.505845 ***	-5.537592 ***	-5.792973 ***	-5.527916 ***

2nd Diff.	DLNINTRATE	-9.773139 ***	-10.13746 ***	-9.967503 ***	-7.079900 ***	-6.896567 ***	-7.259326 ***
Level	LLNTAX	-0.287882	-1.670041	2.721321	-0.412309	-2.021931	1.593300
1st Diff.	DLNTAX	-3.807690 ***	-3.739207 **	-2.444828 **	-3.860698 ***	-3.795002 **	-2.444828 **
2nd	DLNTAX	-14.87625 ***	-14.86410 ***	-15.15107 ***	-6.683341 ***	-6.557317 ***	-6.806085 ***
Level	LLNXRATE	-0.287882	-1.670041	2.721321 **	-0.243336	-2.021931	1.593300
1st Diff.	DLNXRATE	-3.807690 **	-3.739207 **	-2.444828 **	-3.860698 ***	-3.795002 *	-2.444828 **
2nd Diff.	DLNXRATE	-14.87625 ***	-14.86410 ***	-15.15107 ***	-6.683341 ***	-6.557317 ***	-6.806085 ***
Level	LLNDEBT	-2.024815	-1.946019	0.605101	-1.938652	-1.845587	0.609542

1st Diff.	DLNDEBT	-4.710534***	-4.609829***	-4.739643***	-4.775401***	-4.705250***	-4.800052***
2nd Diff.	DLNDEBT	-15.51504***	-16.10907***	-16.00871***	-7.947946***	-4.476640***	-8.078151***
Level	LLNCPI	-0.636383	-1.217612	2.192239	-0.966782	-2.113209	0.444075
1st Diff	DLNCPI	-3.100006**	-3.109085	-1.151939	-3.198701**	-3.213783**	-0.588957
2nd Diff	DLNCPI	-10.95126***	-10.74726***	-11.18837***	-7.121274***	-6.986722***	-7.246294***

5.8.8. Residual Diagnostic Test

5.8.8.1. Normality Test

The result in the table 5.11 below shows that both the kurtosis and jarque-bera is significant. Therefore we fail to reject the null hypothesis of normally distribution. Therefore the VAR system is normally distributed.

Table 5.25: VAR normality test results.

COMPONENT	SKEWNESS	KURTOSIS	JARQUE-BERA
1	-0.275467	2.981440	0.405164

2	0.774604	5.044133	8.771362
3	-0.012494	3.257319	0.089117
4	0.074031	2.113142	1.077920
5	0.101216	4.515013	3.114991
6	-0.692532	4.864168	7.191368
7	-0.070734	2.701468	0.145512
8	0.044098	2.923299	0.018215

The VECM results shown under the appendix, shows to be significant. The estimated error-correction tern in the GDP equation is statistically significant and has a negative sign. This confirms that there is not only any problem in the long-run equilibrium relationship of the variables at 10% level of significance, but its value -0.561673 for Malawi shows the rate of convergence to the equilibrium state per year. The speed of adjustment of any disequilibrium towards a long-run equilibrium is about 5.6 % of the disequilibrium of GDP per year.

5.9. Summery

This study comprises of results of this study area. The main focus in this area was to interpret the VAR results based on its lag structure selection. Granger causality has been applied in order to check the long-run interdependence of the variables. Corellogam, unit root test has been used to check the stationary of the data. The long run relationship of the data has been checked by coitegration test. The variance has been found to be constant over time by white heteroscedasticity test. Impulse response and variance decomposition are some of the test used to check what happens after some time when the endogenous variables are innovated or changed in the system.

CHAPTER SIX

Policy recommendations and Conclusion

6.1 Introduction

This chapter of the study comprises of the conclusion to the study and the policy recommendations.

6.2 Conclusion

In section one, the principal substance was to give clarification of the study foundation. This has incorporated the study's presentation, articulation of fiscal issues and its targets relative to the economy in Malawi. The study's theory was foregrounded in a bid to incorporate into the study the developing strategy towards fiscal sanity in Malawi. The fundamental spotlight on part two was to give a wide review of the literature pertinent to this study. In this manner the emphasis was put on breaking down the monetary arrangements the nation received and its effects on the economy's development in Malawi as a developing country. Moreover, conversion scales procedures and an interest rate charge on household and outside obligations has been investigated simultaneously. It has been seen that the nation has more sum on outer obligations not at all like residential imperatives which puts the nation into danger on interest rate instalment on those obligations including its reimbursement.

Section three delved into the different written works from diverse nations and these have been utilized as a part of this study with a specific end goal to broaden viewpoints on the Malawi case both in practical and hypothetically. Hypothetically, the study has concentrated on the relationship of the financial accomplishment in the nation as to the discoveries of Nicolas (1962) on the new development models. Barro and Sala-i-Martin (1995) add on by communicating the impact of innovation change on financial development under endogenous development model. Solow and Swan (1956) put much accentuation on capital amassing and how such practices impact upon the national fiscus.In part four approaches have been examined under the VAR model examination. Estimation method has been introduced and demonstrative estimation system has connected to check whether monetary strategy on financial development information are ordinarily conveyed or does not have serial relationship and heteroscedasticity. Cointegration and additionally drive reaction and change decay has been utilized.

Section five of this study offered clarification and after-effects of this fiscal challenge as they related to Malawi. The primary objective was to decipher the VAR results in light of its slack structure choice. Granger causality has been connected so as to check the long-run association of the variables. Corellogam, unit root test has been utilized to check the trajectory of the economy. The long run relationship of the information has been checked by cointegration test. The difference has been observed to be steady after some time by white heteroscedasticity test. Drive reaction and fluctuation decay are a test's portion used to check what happens after some time when the endogenous variables are developed or changed in the framework. Clearly, the indebtedness of the country which results due to poor budget structure and government overspending slacks down the country's growth.

The VECM results shows speed of adjustment of any disequilibrium towards a long-run equilibrium of about 5.6 % of the disequilibrium of GDP per year in the country.

6.3 Policy recommendations

Malawi's economy is characterised by high government expenditure and high inflation rate as noted in this study. Though this is the case the country's revenue is slim compared to its expenditure which leaves the country with a wide budget deficit. The economy's health is dependent on combination of decrease government expenditure, an increase in taxes, or a decrease in transfer payments. This fiscal policy alternative is intended to restrain the economy by decreasing aggregate expenditures and aggregate demand. It is primarily aimed at reducing inflation rate in the country.

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Appendix

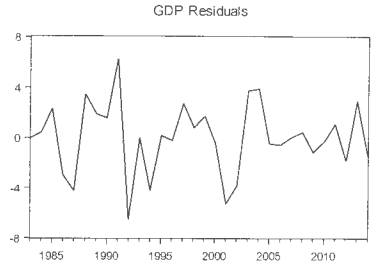
1. VAR RESULTS

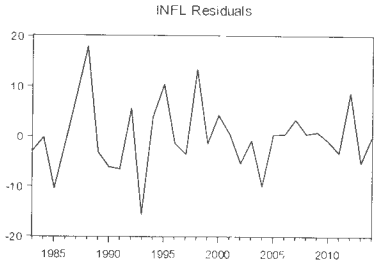
	GDP	INFL	LNDTAX	LNGOVEX	LNINTRATE	LNXRATE	LNDEBT
GDP(-1)	-0.539974	-0.297937	0.020469	0.002058	0.009450	0.010240	0.008836
	(0.25362)	(0.57423)	(0.01099)	(0.00325)	(0.01796)	(0.00994)	(0.01338)
						[1.02993]	[0.66047]
GDP(-2)	0.209332	0.840404	0.011041	0.000946	0.008408	0.010446	0.014961
	(0.24370)	(0.55178)	(0.01056)	(0.00312)	(0.01725)	(0.00955)	(0.01286)
	[0.85897]	[1.52307]	[1.04517]	[0.30298]	[0.48731]	[1.09342]	[1.16373]
INFL(-1)	0.046707	0.022939	-0.003116	0.000127	-0.003007	-0.003558	-0.001158
	(0.10825)	(0.24510)	(0.00469)	(0.00139)	(0.00766)	(0.00424)	(0.00571)
	[0.43147]	[0.09359]	[-0.66411]	[0.09154]	[-0.39242]	[-0.83838]	[-0.20283]
INFL(-2)	-0.099236	-0.231455	-0.005966	-0.001009	-0.003867	-0.000911	-0.003570
	(0.10946)	(0.24784)	(0.00474)	(0.00140)	(0.00775)	(0.00429)	(0.00577)
	[-0.90660]	[-0.93391]	[-1.25733]	[-0.71915]	[-0.49899]	[-0.21241]	[-0.61831]
LNDTAX(-1)	3.884109	-13.24386	0.617665	-0.146237	-0.055382	-0.444422	-0.531327
	(6.74857)	(15.2800)	(0.29255)	(0.08648)	(0.47778)	(0.26456)	(0.35600)
	[0.57555]	[-0.86675]	[2.11134]	[-1.69098]	[-0.11592]	[-1.67987]	[-1.49248]
LNDTAX(-2)	-10.37809	1.965204	-0.286828	0.141119	-0.332188	0.284627	-0.324132
	(5.24259)	(11.8702)	(0.22726)	(0.06718)	(0.37116)	(0.20552)	(0.27656)
	[-1.97957]	[0.16556]	[-1.26210]	[2.10054]	[-0.89499]	[1.38491]	[-1.17201]
LNGOVEX(-1)	21.36347	18.28389	0.582119	0.219625	1.034866	-0.106706	-1.768261
	(18.0542)	(40.8781)	(0.78264)	(0.23136)	(1.27820)	(0.70776)	(0.95241)
	[1.18330]	[0.44728]	[0.74379]	[0.94928]	[0.80963]	[-0.15077]	[-1.85663]
LNGOVEX(-2)	16.49600	86.70687	-0.195837	0.376820	-0.951723	0.695037	-0.296503
	(20.6803)	(46.8240)	(0.89648)	(0.26501)	(1.46412)	(0.81071)	(1.09094)
	[0.79767]	[1.85176]	[-0.21845]	[1.42190]	[-0.65003]	[0.85732]	[-0.27179]
LNINTRATE(-1)	4.168276	-14.22038	-0.105543	-0.061318	0.184055	-0.436743	-0.498896
	(5.33387)	(12.0769)	(0.23122)	(0.06835)	(0.37763)	(0.20910)	(0.28137)
	[0.78147]	[-1.17749]	[-0.45646]	[-0.89709]	[0.48740]	[-2.08870]	[-1.77307]

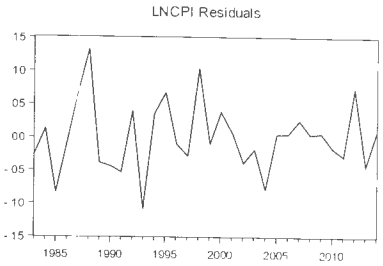
LNINTRATE(-2)	-4.543332	-0.708020	0.153028	0.110553	-0.255889	-0.049796	-0.489452
	(5.05935)	(11.4553)	(0.21932)	(0.06483)	(0.35819)	(0.19834)	(0.26689)
	[-0.89801]	[-0.06181]	[0.69774]	[1.70518]	[-0.71439]	[-0.25107]	[-1.83388]
LNXRATE(-1)	-1.441391	46.20672	0.624219	0.015160	-0.257872	1.317044	0.098479
	(7.85973)	(17.7959)	(0.34071)	(0.10072)	(0.55645)	(0.30812)	(0.41462)
	[-0.18339]	[2.59649]	[1.83209]	[0.15051]	[-0.46342]	[4.27449]	[0.23752]
LNXRATE(-2)	8.552307	-42.16545	0.067791	0.006495	0.336904	-0.320901	0.562364
	(11.5876)	(26.2364)	(0.50231)	(0.14849)	(0.82037)	(0.45426)	(0.61127)
	[0.73806]	[-1.60714]	[0.13496]	[0.04374]	[0.41067]	[-0.70643]	[0.91999]
LNDEBT(-1)	-4.897566	13.74884	-0.202140	0.124792	-0.008114	0.119919	0.450837
	(4.48318)	(10.1507)	(0.19434)	(0.05745)	(0.31740)	(0.17575)	(0.23650)
	[-1.09243]	[1.35447]	[-1.04012]	[2.17217]	[-0.02556]	[0.68233]	[1.90630]
LNDEBT(-2)	-4.588378	-9.602309	0.043357	-0.061090	0.172269	0.114765	0.151661
	(4.57561)	(10.3600)	(0.19835)	(0.05863)	(0.32394)	(0.17937)	(0.24137)
	[-1.00279]	[-0.92686]	[0.21859]	[-1.04188]	[0.53179]	[0.63981]	[0.62832]
C	156.5406	-77.54371	13.58633	-0.204104	22.71607	4.266793	52.00125
	(285.234)	(645.823)	(12.3647)	(3.65519)	(20.1940)	(11.1818)	(15.0468)
	[0.54881]	[-0.12007]	[1.09880]	[-0.05584]	[1.12489]	[0.38159]	[3.45596]

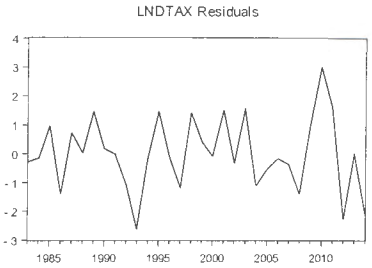
R-squares = GDP=0.629293 INFL= 0.789194 LNDTAX=0.995688 LNGOVEX= 0.632915 LNINTRATE=0.868528 LNXRATE= 0.996088 LNDEBT=0.860022

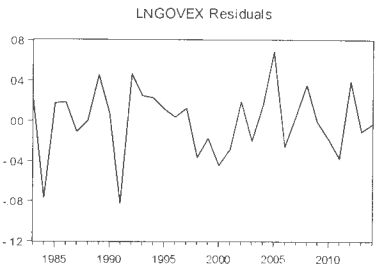
2. RESIDUAL GRAPHS

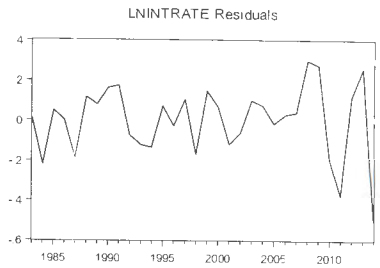


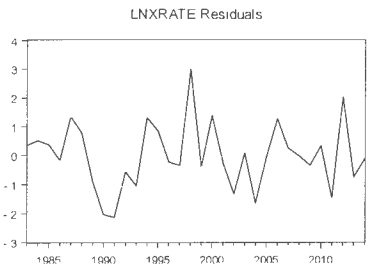


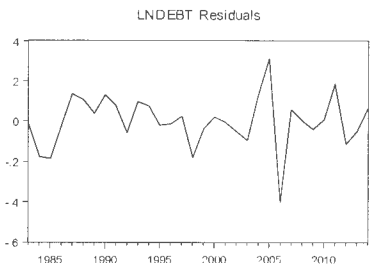




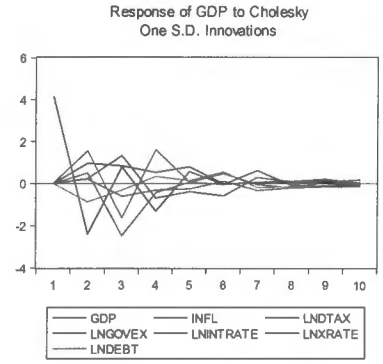


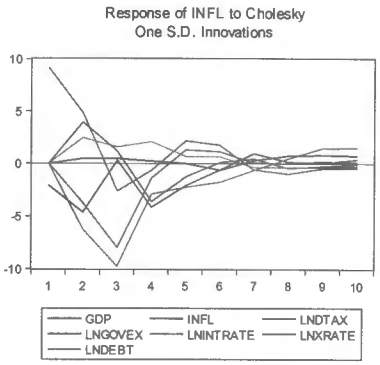


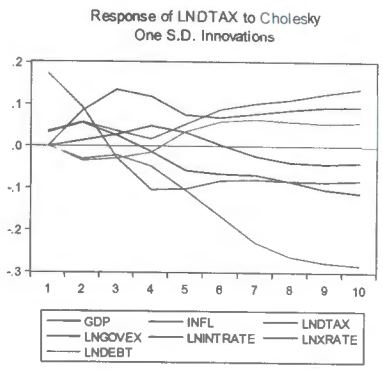


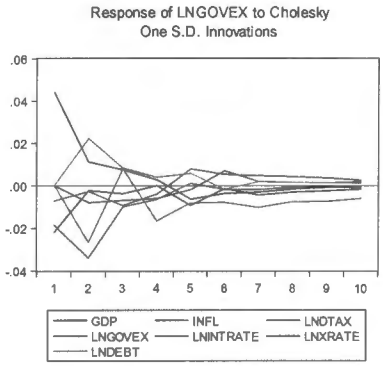


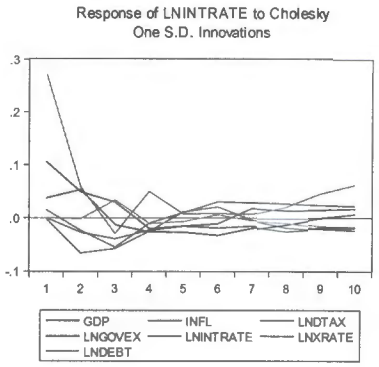
3. MPULSE RESPONSE GRAPHS

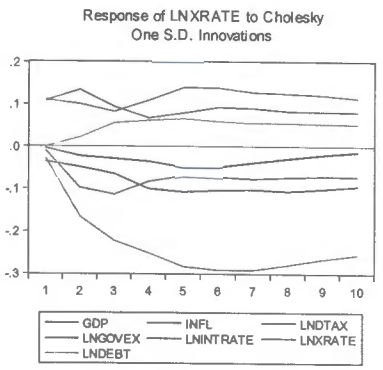


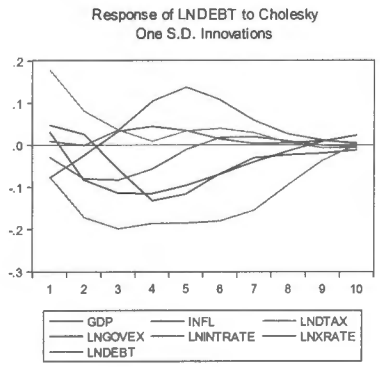












4. VECTOR ERROR CORRECTION MODEL ESTIMATES

CRITARIA: The first row is coefficient, () p-value and [] T-statistics.

INDEPENDENT VARIABLE.	D(GDP)	D(INFL)	D(LNDTAX)	D(LNGOVEX)	D(LNINTRATE)	D(LNXRATE)	D(LNDEBT)
EC	-0.561673 (0.21623) [-2.59752]	-1.764219 (0.48221) [-3.65858]	-0.009566 (0.00852) [-1.12287]	0.000313 (0.00241) [0.13000]	0.007275 (0.01233) [0.58995]	0.004425 (0.00714) [0.61990]	0.010496 (0.01119) [0.93814]
D(GDP(-1))	-0.416700 (0.18768) [-2.22023]	0.101814 (0.41854) [0.24326]	0.014684 (0.00739) [1.98583]	0.000203 (0.00209) [0.09730]	-0.003111 (0.01070) [-0.29063]	-0.002134 (0.00620) [-0.34443]	-0.006921 (0.00971) [-0.71271]
D(INFL(-1))	0.088045 (0.08344) [1.05519]	-0.108150 (0.18608) [-0.58121]	-0.004131 (0.00329) [-1.25651]	-5.39E-05 (0.00093) [-0.05805]	-0.001099 (0.00476) [-0.23100]	-0.003073 (0.00275) [-1.11568]	-0.002327 (0.00432) [-0.53909]
D(LNDTAX(-1))	3.869561 (4.41921) [0.87562]	-22.41934 (9.85508) [-2.27490]	0.335028 (0.17411) [1.92420]	-0.099142 (0.04922) [-2.01433]	-0.162452 (0.25201) [-0.64461]	-0.380480 (0.14589) [-2.60797]	-0.384572 (0.22866) [-1.68185]
D(LNGOVEX(-1))	-5.261254 (20.5869) [-0.25556]	-83.72343 (45.9098) [-1.82365]	0.337030 (0.81110) [0.41552]	-0.499347 (0.22928) [-2.17786]	1.378854 (1.17401) [1.17449]	0.016156 (0.67963) [0.02377]	-0.982128 (1.06521) [-0.92200]
D(LNINTRATE(-1))	-0.889963 (4.45156) [-0.19992]	-20.81238 (9.92722) [-2.09650]	0.017762 (0.17539) [0.10128]	-0.058140 (0.04958) [-1.17269]	-0.274366 (0.25386) [-1.08078]	-0.109022 (0.14696) [-0.74186]	-0.009748 (0.23033) [-0.04232]
D(LNXRATE(-1))	13.77065 (7.40397) [1.85990]	43.65885 (16.5113) [2.64419]	0.832879 (0.29171) [2.85516]	-0.011872 (0.08246) [-0.14397]	0.081447 (0.42223) [0.19290]	0.487882 (0.24443) [1.99603]	0.306562 (0.38310) [0.80022]
D(LNDEBT(-1))	1.357399 (4.56635) [0.29726]	30.28914 (10.1832) [2.97442]	-0.051619 (0.17991) [-0.28691]	0.096114 (0.05086) [1.88989]	0.159723 (0.26041) [0.61336]	0.067104 (0.15075) [0.44514]	0.010942 (0.23627) [0.04631]