THE DIRECTION OF CAUSALITY BETWEEN FINANCIAL

DEVELOPMENT AND ECONOMIC GROWTH IN TANZANIA AN

EMPIRICAL ANALYSIS

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A THESIS SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS

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CERTIFICATION

The undersigned certifies that he has read the and hereby recommends for acceptance by the Open University of Tanzania a thesis titled**, "The Direction of Causality between Financial Development and Economic Growth in Tanzania, An Empirical Analysis"** in fulfillment of the requirements for the degree of Master of Arts in Economics of the Open University of Tanzania.

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Date

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DECLARATION

I, **Erasmus Bernald Hyera,** do hereby declare that this thesis is my original work and has never been submitted to any other higher learning academic institution for similar award or any other degree award.

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Signature

………………………

Date

DEDICATION

I dedicate this thesis to my beloved mother the late *Vestina Komba* who passed away when I was still very young, may her soul rest in eternal peace. I also dedicate to my beloved father Mr. *Bernarld Erasmus Hyera* for his good care and tireless support, brothers and sisters. I have nothing special that I can give to the levels of your satisfaction but rather I love you all.

ACKNOWLEGMENTS

ABSTRACT

The main objective of this study was to examine causality relationships between financial development and economic growth in Tanzania. In time series context, recently econometric techniques were used; namely Augmented Dickey and Fuller test (ADF) for unit roots, Johansen test for Co-intergration test, Vector Error Correction Model, Granger causality test under VAR framework used to establish direction of causality, and Variance decomposition (VD) applied for validating strengths of findings outside the estimated sampling period. The overall empirical findings can be summarized as follows. Firstly, there is long-run relationship between financial development and economic growth. Secondly, granger causality test suggests economic growth causes financial development in a short-run when broad money to nominal GDP and liquidity liabilities to nominal GDP used, however when credit to private sector to nominal GDP was used findings confirmed evidence of bidirectional causality, and in long run causality run only from financial development to economic growth even in outside the estimated sampling period. Thirdly, financial sector in Tanzania has been effective in promoting economic growth in a short run only. Lastly, capital accumulation channel via gross domestic investments to nominal GDP links financial development and economic growth in a short run, suggesting long-term financial infrastructures necessary for successful promoting investments for spurring economic growth are still remain weak in Tanzania. In view of feedback effect results, study recommend more efforts should be devoted to the deepening of financial sector by enhancing competition, improving business environment, investing on human resources and legal environment.

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ADF	Augmented Dickey Fuller
Credit pvt sect/GDP	Credits provided to private sector to Gross Domestic Products
DOL	Dynamic Ordinary Least Square
ECM	Error Correction Model
GDP	Gross domestic product
IFS	International financial statistics
IMF	International Monetary Fund
I/GDP	Gross domestic investments' to Nominal Gross Domestic Product
LN	Logarithms
LQL/GDP	Liquidity Liabilities to Nominal Gross Domestic Product
M2/GDP	Broad money supply to Nominal Gross Domestic Product
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Square
S/GDP	Gross savings to Nominal Gross Domestic Product
SOL	Static Ordinary Least Square
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
WB	World Bank
WEO	World Economic Indicators

CHAPTER ONE

INTRODUCTION

1.1   Introduction

The Link between financial development and economic growth has been examined by numerous empirical and theoretical studies and it is generally well recognized that, financial sector is crucial for economic development (Levine, 1997 and Eita et al., 2007; Hussain, 2012). It improves productivity and economic growth through functions which are part of financial system such as, allocating capital, evaluation and monitoring borrowers, reducing risk and mobilizing savings through either effects of capital accumulation (rate of investment) and technological innovation. Greater financial development leads to greater mobilization of savings and its allocation to highest-return investments projects. This increased accumulation of capital enhances economic growth. Also, financial sector by allocating capital to the right investment project and promoting sound cooperate governance, increases rate of technological innovation and productivity growth which further enhance economic growth and welfare of a nation (World Economic Forum report, 2012).

Theoretical relationship between financial development and economic growth has been well established in economic literature and date back to the work of Bagehot (1873) who claims that, large well organized capital markets in England enhanced resource allocation towards to more productive investments. Other early work along with this view is Schumpeter (1911) who emphasized the role of financial sector and especially the banking sector as paramount in promoting economic development by mobilizing savings, and encouraging productive investments.

However, until 1960s the impacts of financial sectors' development on the process of economic growth of a nation did not gain sufficient weight in literature. It is latter work of Economists like MacKinnon (1973) and Shaw in 1973 among others who threw light on aspects of economic growth and have succeeded to attract attention and interest of economists of modern times. Although Mackinnon-Shaw hypothesis was very influential and was used in affecting policies of many developing countries, it was the findings study of King and Levine (1993) which has attempted to generate renewed interest on the effects of finance on economic growth (Hussein et al., 2012).

Consequently, numerous studies have been undertaken attempting to answer two related questions, correlation and the direction of causality between financial development and economic growth. The direction of causality between financial development and economic growth has always remained a controversial and central question being whether financial development causes economic growth or economic growth causes financial sector development. (Sindano, 2009, Aknilo et al, (2010). So far this issue is unsettled as economists still hold different perspectives on the results of the causality.

Acaravci et al (2009), study in Sub-Saharan African countries between 1975-2005 using panel data, findings confirmed bidirectional causality relationship between the two variables for 24 sub Saharan African Countries, Aknilo et al, (2010) confirmed mixed results on the direction of causality (supply hypothesis, demand following hypothesis and bidirectional causality) for 10 sub Sahara African countries using time series data, Abu- Bader et al (2005) using time series data, study found the direction of causality in Egypt is running from financial development to economic

growth (supply hypothesis). Mina Baliamoune-lutz (2011) confirmed mixed results on both short run and long-run between the two variables for African countries, income causes finance, finance cause income and bidirectional causality. Presence of conflicting results justify that, the direction of causality between the two variables is inconclusive and need further investigations.

The question of causality is important because determination of these causal patterns between financial development and economic growth has important implications for policy makers' decisions about appropriate growth and development policies to adopt in both short run and long run. The existing empirical works have well documented in economic development literature that, there is strong correlation between financial development and economic growth, but results on the direction of the causality has remained mixed, conflicting and arguable.

Over the past three decades, many empirical literature on the direction of causality between financial development and economic growth were in favor of supply views which is based on proposition that, financial development causes economic growth, empirical studies based on demand following views where, financial development is seen as the handmaiden of economic growth or simply finance follows economic growth are steadily growing in number and substance (Odhiambo, 2008). It is surprising to notice that, in most of the times studies undertaken favoring these two views largely concentrated in Latin America, Asia and in advanced economies with insufficient coverage or none at all about Sub-Sahara Africa and mostly were cross country studies. However, despite their bias about Sub- Sahara Africa studies have failed to address country specific issues (Odhiambo, 2011).

By standards of developing countries, Tanzania is regarded as least of developing country in Sub Sahara Africa and has relatively less developed financial system when compared to its neighboring countries like Kenya in East Africa. The World Economic Forum Finance report (2012), which measures development financial sector covering the best world financial systems including Tanzanian financial system, Tanzania was ranked the 60th out 62 countries covered whereas Kenya was ranked 54th, Ghana 56th, and South Africa 28th. Its financial sector deepening as measured by financial depth indicators has not reached to the expected levels; is even below that recorded in 1980 though has undergone through series of reforms.

In 1980 the ratio of M2/GDP and liquidity liability/GDP, were 41 and 41.4 in percentages respectively but as at 2013 the ratios recorded 26, and 32 in percentages respectively. While some African countries like Mauritius have taken serious steps to deepen their financial sector and have recorded impressive growth on these indicators but the scenario is different in Tanzania. Between 1980-1985, 1986-1990, and 1991-1994 the ratio of M2/GDP for Tanzania on average were 0.32, 0.36 and 0.34 which were in sharp contrast recorded in Mauritius with averages 0.43, 0.60, and 0.73 for each of the above periods respectively Michael Graham (1996).

Financial sector in Tanzania comprises banks, pension funds, insurance and other financial intermediaries (Christina Falle, 2013). Banking sector is the most dominant and play clear intermediary role than others, suggesting reforms far embarked have largely impacted banking sector. According to the Bank of Tanzania report (2013), Banking sector account for about 74% of total assets in the financial system while pension and insurance sector accounts only for 24% and 2% respectively .Its

contribution to the economy is still small and growth rate has peaked up recently and yet has not reached even to 15 percent and among other major impediments impairing its further development and contribution is poor business environment, financial access and narrow services both banking and in non banking institutions. According to World Economic forum finance report (2012), Tanzania scored very low for the four pillars and was ranked the 59th for each of the first two pillars and 61st, 62nd respectively out of 62 countries included in the analysis.

Economic growth rate since independence to the present time has exhibited different patterns with periods of high and moderate growth rates. Between 1967-1973, real GDP growth rate was satisfactory on average by 4.4 percent, however in 1974-1985 growth rate of GDP went down on average was 2.4 percent, with a decline of 2 percent from the previous phase and within the same phase headed down and record negative historic GDP growth rate in 1981 as –0.5 percent and in 1983 deepen down to -2.4 percent and major driving forces for the downturn were economic crisis that hit the economy, oil crisis, draught, war with Uganda, prolonged deficit budget and repression policies which undermined macroeconomic stability needed for long-term growth, from 1986-1989 the growth rate of real GDP was by 3.9, percent on average, 1990-1994, 4.2 percent and, 1995-2012 was 6.6 percent on average.

The upward real GDP growth rate from 1986 to the present is trying to suggest reforms and especially financial sector reforms implemented in Tanzania have matured to a point of starting providing good results on growth rate and to the economic development of the country.

But, for the purpose of drawing proper inferences about impacts of financial sector through financial reforms implemented on economic growth over the last 32 years, it cannot be only done by observing up and down trend of variables, rather need to be tested empirically by using advanced econometric techniques to provide evidence based on findings that, financial reforms have impacted financial sector and ultimately economic growth rate for further policy development and setting strategies of stimulating economic development in both short term and long term. It is therefore imperative, to examine the direction of causality between financial development and economic growth for the case of Tanzania to ascertain whether financial sector though reforms implemented have caused economic growth or economic growth has caused financial sector development over the last three decades.

In Tanzania, studies on the direction of causality between financial development and economic growth are limited (Odhiambo, 2005, 2011, Falle, 2013) and that examined causality mostly have attempted to use financial development indicators and economic growth variables to conduct their analysis; they have not well explained specific mechanisms or channels in which Tanzanian financial sector development impact economic growth and vice versa on their way to establish the direction of causality. In addition to that, result on the direction of causality has remained ambiguous as it has been elsewhere. Pointing recently studies addressed causality (Akinbodae 2000, Odhiambo 2005, Mbellenge and Aikael, 2010, and Christine 2013,) does not establish the channels for the direction of causality obtained, instead they just take for granted without testing and beside, majority limited their studies in biviriate analysis.

Notable study in trivariate framework conducted recently by (Odhiambo, 2011) and according to him majority of previous studies have been done in biviriate framework and are suffering from model specification bias. Also extending the model with two conditional variables as opposed to one through multivariate case, the results on the direction of causality were affected and linked to the concrete channels, because even the model used by Odhiambo in his analysis is also faced with omission bias problem. For instance he used only M2/GDP as the measure of financial development and diverge from the reality that, financial development is a multidimensional concept and cannot be captured by a single indicator. Hussein (1996) noted that, financial development cannot be captured by a single financial indicator. The danger of using of biased model is that, it can lead to misguided conclusions.

Further, in the surveyed literature, most of studies examined the direction of causality between financial development and economic growth in Tanzania did not attempt to examine causality beyond the sampling period for example by employing variance decomposition (VD) function to test the strength and validity of their causality results. Hence, it is not clear whether there is causality or not outside the estimated sampling period in Tanzania.

Since previous empirical studies have obtained mixed findings on the direction of causality, this study will continue the early efforts of researchers using recently Tanzanian time series data and attempts to fill the void by investigating as to how financial development and economic growth is related in Tanzania using advanced econometric techniques such as, granger causality test through co-integrated Vector

Autoregressive methods and Variance decomposition (VD) for the purpose of enhancing understanding on how and to what extent does financial sector development contributes to economic growth and vice versa and provide further empirical evidence from Tanzania.

Furthermore, this study adds on scope of understanding about interaction mechanisms between the two variables by testing empirically. Beck et al (2000) noted that, financial development might influence growth via improvements in technology (through better allocation of savings) or via rapid capital accumulation (by increasing domestic investments rates and attracting foreign capital). By testing whether financial development in Tanzania influence growth via improvement in technology or through capital accumulation (by increase in domestic investment) will help to deepen our understanding about what links financial development and economic growth in Tanzania.

1.2   Statement of the Problem

Tanzania is among Sub-Saharan African countries, which are in more need of rapid economic development than the rest regions. Because the region lags behind the other developing countries in the other parts of the world due to prolonged economic stagnation and declines experienced for the past two decades. IMF (2013), the pace of growth recorded in Sub Saharan Africa since the mid 1990 still represents, sharp break with experience of falling in living standards and macroeconomic instability in sub Saharan Africa during the previous two decades, a period when the region fell behind developing countries in other parts of the world. Ndulu et al, (1996), in a sample of 61 countries, Low income developing countries including 32 Sub Saharan

Africa countries and find that, the average annual growth rate in real percapita GDP for sub-Saharan Africa countries declined from 1.19 percent in 1970s to about -0.99 percent in 1980s, with an average of -0.35 percent for the two decades. According to them, this rather gloomy performance is in sharp contrast to the record of other developing countries included in a sample where average annual growth rate was 3.47 percent, 1.82 percent and 2.33 percent for each of the above periods respectively.

Many economists such as (Levine, 1997) and (Hussein. 1999) recognizes that, well established financial markets with sophisticated institutions and regulatory system can spur economic growth and ultimately economic development through raising rates of savings and investments. That, well developed financial system mobilizes savings from different savers and channels portion of savings to the most productive investments which in turn improves economic growth. Thus, without financial system these savings might not be available for investments and this may create difficulties in achieving long-term economic development.

In Sub-Sahara African countries, room of building long-term sustainable economic development is possible through developing financial sector because is a precondition for economic growth potentials, as raising rates of accumulation of physical and human capital and utilization of resulting productive assets efficiently undoubtly need to be supported by saving -investments process through financial intermediations. Continuing with state of underdeveloped financial sector, it is unlikely for countries in Sub Saharan Africa to attain long-term sustainable economic development. According to the World Economic forum finance report

(2012), the performance and long-term economic growth and welfare of a country is related to its degree of financial development. The higher the degree of financial development the wider the availability of financial services that allows for diversification of risk and such diversification increases long-term growth trajectory of a country and ultimately improves welfare and prospects of producers and consumers who have access to financial services.

When comparing Tanzanian financial sector with the rest of the developing countries especially those of East and South Asia in line with the above argument, the Tanzanian financial sector is still weak concentrating mainly on banking sector and cannot be isolated from its still weak nature of the economy. The depressing economic performance of the country has been widely explained by different factors and among others includes, draught, oil price upsurge, floods, and by the fact that agriculture is the main stay of the economy which its contribution to the GDP still remain small. (World Bank, 2009) agriculture though remains the mainstay of the Tanzanian economy account for nearly quarter of the GDP and 80 percent of employment. Other internal explanations being, poor policies both macroeconomic and sectoral policies, emanating from development paradigm that gave a state prominent role in production, controlling economic activities, overvalued exchange rates, larger and prolonged budget deficits which undermined macroeconomic stability needed for the long-term growth, low investment which limits the efforts of diversifying economic structures for fostering economic growth, and the dysfunctional nature of financial markets and institutions as it has been the case in most of African countries.

However, economists have argued that growth depend on financial sector development. In recently years in Tanzania we have witnessed impressive sustained real GDP growth rate with substantial progress on financial sector after implementation of series of reforms, situation which poses question as to whether financial sector development in Tanzania has caused economic growth or it is economic growth which has caused financial sector development over the last 32 years. Majority of previous studies on the relationship between financial development and economic growth based on cross country studies and largely concentrated in Latin America and Asia and in advanced economies with insufficient coverage about Sub-Sahara Africa (Odhiambo, 2011).

It is now clear that, the system of taking many countries and lumping together as group does not settle country specific issues as countries like Tanzania are heterogeneous in many aspects including level of financial sector development and therefore its results might be specific.

Although, the conventional wisdom in literature over more than past three decades has been largely in favour of supply views which is based on belief that financial development causes economic growth, studies based on demand following views which asserts that economic growth causes financial development are steadily growing in number and substance (Odhiambo, 2008). Apart from two competing views, other views believe on bidirectional causality between financial development and economic growth and no causality from one to another. Both views are solid neither one is strong nor weak (Valickova, 2012).

In Tanzania, empirical studies investigated the causal relationship between financial development and economic growth have confirmed conflicting results as it has been elsewhere with causality either running from finance to growth, or growth to finance and bidirectional causality and yet no conclusive consensus have been achieved on the results. Still there is different perspectives on the results, it is therefore imperative to conduct other empirical studies like this so as to help policy makers as they seek to develop both short term and long-term strategies for improving economic growth and stimulating further economic development of the country.

It is interesting to take Tanzania as a case study for this subject for several reasons. Firstly, its move from deep economic decline in the early of 1980 to well sustained economic growth rate taking pace from 1990s to the present, has made Tanzania to be among of Sub-Saharan African countries with fastest growing economy. World Bank (2009), point out the same. Accompanying this development; there has been substantial improvement in the financial system. A pertinent question to ask is how the two variables have been related and interacted?

Secondly, Tanzania has rich history of economic and financial sectors reforms which marked its beginning from 1980s and yet there is little empirical evidences providing policy makers with necessary information as to whether financial reforms had any impact on financial system and hence on economic growth. (Odhiambo, 2005, 2011; Christine, 2013) have argued that studies on the direction of causality between financial development and economic growth are scarce in Tanzania, and where undertaken causality results and interaction mechanisms has remained conflicting and inconclusive. Further, Kilindo (1996) documented that, literature on money in

Tanzanian economy is numerous however; main areas, which have received attention, are on relationship between money and inflation, inflation and balance of payments.

Thirdly, at national level the finance -growth nexus has yielded conflicting results and yet the nexus has remained inconclusive, this motivates further researches on this nexus as an attempt to address the controversy based on specific country for policy advice of whether the policy makers in Tanzania should first pursue financial development related policies to induce higher levels of economic growth or should concentrate on developing real sectors of economy in order to stimulate development of financial sector. Besides that, most of the studies in the surveyed literature have assumed existence of channels linking the two variables without testing and causality has been examined only within the estimated period, outside the estimated period studies discuss nothing, hence failed to ascertain whether beyond the sampling period there is also a robust result on causality or not.

Therefore this study aims at filling these gaps by examining empirically the direction of causality between financial development and economic growth in Tanzania in Multivariate framework using three financial indicators (M2/GDP, Liquidity L/GDP and Credit private sector/GDP) and other three variables savings/GDP, domestic investment/GDP and real GDP percapita) and uses granger causality test to interpret the causality. Li (2009) noted that, causality can be interpreted by causality approach in our common sense. Savings and domestic investment have been included as models to explore the mechanisms (capital accumulation and technological innovation) if the financial sector causes economic growth and vice versa through

these channels for the case of Tanzania and resolve issue of model specification bias, which has been a common reported problem in bivariate framework analysis. Further, present study goes beyond by testing validity of the causality beyond sampling period using Variance Decomposition (VD).

1.3 Research Objectives

The overall objective of this study is to determine the causal relationship between financial development and economic growth in Tanzania. To be specific, present study is aimed at achieving the followings:

(i) To establish the direction of causality between financial development and economic growth using longer time series data.

(ii) To examine effectiveness of financial sector on economic growth process in Tanzania.

(iii) To establish channels linking financial development and economic growth in Tanzania.

1.4 Hypothesis Tested

H_o: Financial development does not causes economic growth and economic growth does not causes financial development

H_1: Financial development causes economic growth and Economic growth causes financial development.

1.5 Significance of the Study

Study on the relationship between financial development and economic growth in Tanzania is usually important to ascertain whether financial development causes

economic growth or economic growth causes financial development in both short-run and long-run hence, this may help policy makers or decision makers in designing reforms that indeed promote growth –enhancing financial sector development for instituting competitive economic growth as stipulated in Tanzania development vision 2025.

It account for wrong impressions and unclear explanations on financial development given by cross- country studies on the finance-growth nexus. Most of these studies treated countries as homogeneous entities in their regression models, thus provided explanations which did not reflect real level of financial development of a specific country.

As an extension of frontiers knowledge, this study contributes to the existing debate by analyzing the causal relationship between financial development and economic growth using modern econometric techniques and longer time series data from Tanzania.

1.6   Organization of the Study

The rest part this paper is organized as follows; chapter 2, overview of economic development and financial system of Tanzania, chapter 3 theoretical and Literature reviews and Chapter 4 discuss research design and methodology, chapter 5 results and discussion, and chapter 6 Conclusion and policy recommendations.

CHAPTER TWO

A BRIEF REVIEW OF ECONOMIC AND FINANCIAL DEVELOPMENT IN TANZANIA

2.1   Introduction

Tanzanian economic and financial sector development has passed through a long way of history, from colonial era with mixed economic system to socialist regime with centrally planned policies and finally to the present market based economy. Through these economic transformations different interventions were pursued to respond to the needs of each economic system. Thus, four distinct periods are identified to explain Tanzanian economic and financial development from independence times to the present: First, pre-Arusha period 1961-1966, Second, period of socialism 1967-1985 and third period of economic reforms and stabilization from 1986 -1992 and fourth , period of financial sector liberalization from 1993 to 2012.

2.2   Pre-Arusha Period between 1961-1966

The development strategy Tanzania followed soon after its independence was based on mixed economy as inherited from colonial power in which private investments was encouraged, including foreign direct investments (FDI). There were no drastic changes in economic policies, which had been pursued by colonial power. During this period real percapita income growth was high on average 2 percent per year, capital formation or gross domestic investment /GDP increased steadily especially between 1963- 1966 from 10.7 percent to 15.1, inflation on average was by 3.8

percent, fairly low. Largest foreign commercial banks were only 3, standard charter of South Africa, national Grindlay bank and Barclays banks and others were small banks, such as bank of India (1953), bank of Baroda (1953), bank of Pakistan and ottoman bank (1958), and non banking institutions were Tanzania postal saving bank, foreign insurance companies with three specialized agricultural credit institutions of colonial government as land bank, local development loan fund, and African productivity loan fund (Mutaitina, 1994, BoT, 2011). Money and quasi money growth (M2%) on average was by 90 percent, and growth recorded very high in 1966 with 476.7 percent. In general almost the whole period country enjoyed macroeconomic stability and especially from 1963-1966 where inflation mostly was very low, balance of payment was satisfactory and gross domestic investments was increasing steadily as presented in the Table 2.1.

Table 2.1: Performance of Selected Indicators Pre Arusha Period 1961-1966

	1961	1962	1963	1964	1965	1966	Total	Average
Real percapita income growth %	-7.1	4.3	1.2	3.6	-0.2	9.9	11.7	1.95
Inflation %	7.8	0.6	4.9	2.8	-2.4	9.3	23	3.83
Monetary growth (M2)%		21.7	25.6	-16	31.8	476.7	540	90.03
Gross investment/GDP (%)	13.7	11.6	10.7	12	13.9	15.1	77	12.83
Terms of trade% (1987=100)	130	124	137	142	137	137	807	134.4

Source: OECD Report (1999)

Major concern to government at this period was disappointing shortfall in foreign inflows because donors were uncertain with the new government in power and coupled with political concerns those five years of independent government as economy was largely on hands of foreigners and Tanzanians of allied origins (Wangwe, and Charles 2005).

2.3   Socialism Period (Arusha Declaration Period) 1967 to 1985

Shortfall in inflows and ownership of the economy being largely on hands of foreigners and Tanzanians of allied origins those first five years of independence, government decided to change its development strategy with view to facilitate broader ownership of major means of production and distribution through Arusha declaration in 1967. It was based on self-re liance policies and protectionism, which entailed the state taking a leading role in national development. These included extensive compulsory villagelization (Ujamaa), nationalization and price controls. The nationalization of private owned companies since 1967 and creation of management based enterprises which was based on the infant industry considerations and thinking that the state was in better position to guide the society towards to more sustainable economic development.

Justification for nationalization and extensive involvement of the state in productive activities was the ability of state to control negative externalities, exploit economies of scale, and operate firm officially at optimal level (ESRF, 2003). During this period major investments were made on basic social services such as education and health services and initially country made considerable achievements on human development such as on school enrollments, adult education, health development but the most striking one was rise of literacy to 90 percent up in 1985 from 33 percent in 1970s (Wangwe, and Charles 2005). Real GDP growth rate especially between 1967-73 on average was by 4.4 percent.

However, the gains was not sustained, it was interrupted by economic crisis starting from the 1974 and deepened down in 1980s where macroeconomic variables were

out of balance. The real GDP growth rate on average was by 2,4 percent between 1974-1985 lower than that recorded in 1967-73 with negative historic growth rate of real GDP record in 1981   -0.5 percent and in 1982 -2.4 percent, gross domestic investments to GDP throughout the period remained 24.4 percent on average reflecting investments in inefficient public sector with increasing and decreasing trend patterns between 1967-1978, but for period 1979-1985 saw a steady decline from 33.6 to 18.7 percent for the respective years and real percapita income fell by 0.01 percent per year. Agriculture the mainstay of the economy was subjected to heavy taxes and experienced decline due to little allocation of resources, for-example between 1966-1970. Agriculture received only 9 percent of fixed capital formation. All these lead to chaos and uncertainties to the economy.

On financial sector front, all financial institutions were nationalized and all banks were merged into one bank as National Bank of Commerce (NBC) established under act of 1967. It was expected that the nationalized financial institutions would play fair social role rather than private profitability criteria and would extend their services beyond the limitations of foreign institutions and attain the rapid extension of banking facilities throughout the country, efficient distribution of savings mobilized through banking system and modest profits for the government. The outcome for this proved otherwise since to reach these expectations depended on its legal standing and type of control exerted over it by the monetary authority, therefore the sector performed poorly (Mutaitina, 1994).

Among major reasons for the poor performance of financial sector, was caused by the transition Tanzania underwent from mixed to socialist economy with centrally

planning policies, which had direct diverse effects on the structure and policies of the financial sector in Tanzania and has even contributed to its current underdeveloped state.

During this time, financial sector was highly repressed, because the use of monetary policy was based on direct instruments and key features included, high reserve requirements on deposits,, statutory ceilings on bank lending and deposits and credit allocation to the private sector subjected to the government control based on priorities identified such as agriculture, and governments agencies and likewise exchange rates was administered administratively.

The impacts of repression policy were reflected by weak financial sector, high inflation rate reaching double digits on average 15. 9 percent, low savings, negative interest rates, and bank loans mostly turned to be non- performing. Up to 1999 about three-quarter NBC loans were non performing (OECD report, 1999). Money and quasi –money growth (M2%) as financial indicator measuring the development of financial sector, its growth rate on average recorded only 19.3 percent, swinging up and down in most of the periods instead of indicating steady growth rate and its pattern was not clear and predictcable, suggesting existence of repressed policies on the financial sector.

That, well sustained increase in growth rate of M2 tends to suggest development of financial sector which in turn contributes to economic growth through saving-investments process, but for this cases its patterns was not clear and throughout the period remained not sustained.

Figure 2.1: Trend of Selected Indicators from 1967-1985

Data source: OECD report (1999), and BOT various operational reports

2.4 Economic Reforms and Adjustments Structural Programmes from 1986 -1992

In response to the economic crisis of the late 1970s to 1980s, Tanzania adopted series of economic recovery programmes under IMF and structural adjustments programmes under World Bank, which started officially from 1986. Under the first economic recovery programme (ERP1) 1986-1989, Tanzania adopted stabilization measures, macroeconomic policy reforms, trade reforms, and exchange rate reforms (Wangwe, 2005).

The outcomes of the reforms were, the stop and go tendency of the economy halted with real GDP growth rate recovering on average recording 4.4 percent, domestic investment to GDP was 22 percent on average with up and down fluctuations in most of the periods, credit to private sector to GDP as allocated by financial sector to private firms was only 8.1 percent on average with increasing and decreasing trend patterns, Savings to GDP averaged, 19 percent with increasing and decreasing trend,

M2/ GDP and Liquidity liability /GDP averaged 21.5 and 21.8 percent respectively and demonstrated decline trends.

By the end of the 1980s the economic recovery programme one had began to address the concern of poverty because of its social dimension of structural adjustments, this contributed to the formation of Economic and Social Action Programme or (ERPII) implemented from1989-1992. This was an attempt to take social dimension of adjustments.

The outcomes for the selected variables were, real GDP growth rate went down on average recording 3.3 percent, in contrast with 4.4 growth rate recorded in economic recovery one (ERPI); domestic investment to GDP was by 24.3 percent up from 22 percent, credit to private sector to GDP peaked up and recorded 12 percent on average, savings to GDP averaged to 22.8 percent, broad money supply to GDP and liquidity liability to GDP continue to decline on average to 19.6 and 20.2 percent respectively.

In general the shift in management of the economy towards market orientation and private sector development eased the otherwise tight control system and generated initial growth that way. However, the growth recovery could not be sustained as it soon came up against infrastructural bottlenecks and an institutional framework that was inappropriate for a market economy and private sector development (Wangwe, and Charles, 2005). Institutional reforms indeed were needed for appropriate functioning of market economy principles.

2.5   Period of Financial Sector Liberalization from 1993 to 2012

2.5.1   First Financial Sector Reforms from 1993- 2005

Although financial sector was liberalized for the first time in 1991, following to the enactment of Banking and finance Act of 1991 to open window for entry of private institutions in the financial sector; there was no immediate response of banks entry until 1994 when many private banks started officially to operate in Tanzania (IMF, 2009).

The banking and finance Act of 1991 paved the way to market based financial sector as a strategy to turn around the deteriorating economy and accelerating economic growth in Tanzania which was aimed to put in place conducive environment for efficient provision of financial services based on market principles. In the same year the Loans and Advances Realization Trust Act of 1991 was passed which intended to realize non –performing loans under state owned banks and restructure them for privatization of banks such as CRDB, NBC and liquidation of Tanzania Housing Banks (THB).

Later on, followed with Exchange Rate Act which was passed in 1992 for liberalizing external trade and foreign exchange regime, the Capital Markets and Securities Act of 1994 was again passed for the establishment of stock exchange for mobilizing and allocating credit to medium and long-term investments, and further Bank of Tanzania Act was passed in 1995 which focused on single role (price stability) and mandated to regulate financial system as opposed to multiple objectives. Others were the insurance Act of 1996 and national microfinance Act of

2000 (BOT, 2009, IMF, 2009). Figure 2.2 represent trend of selected indicators from 1993-2005 following to the implementation of reforms.
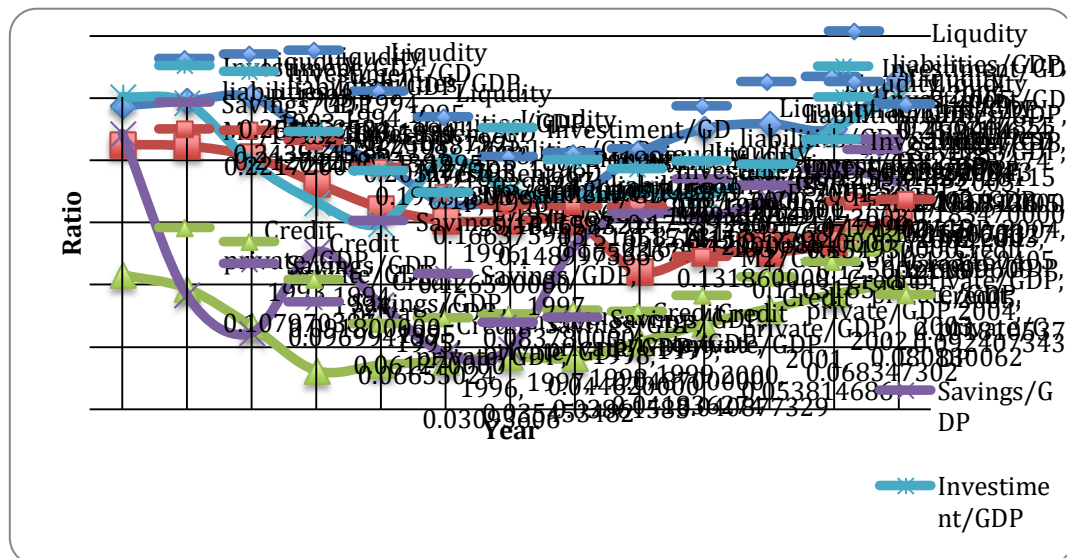
Figure 2.2: Trend of Selected Indicators from 1993-2005
Source: Author (IMF data)
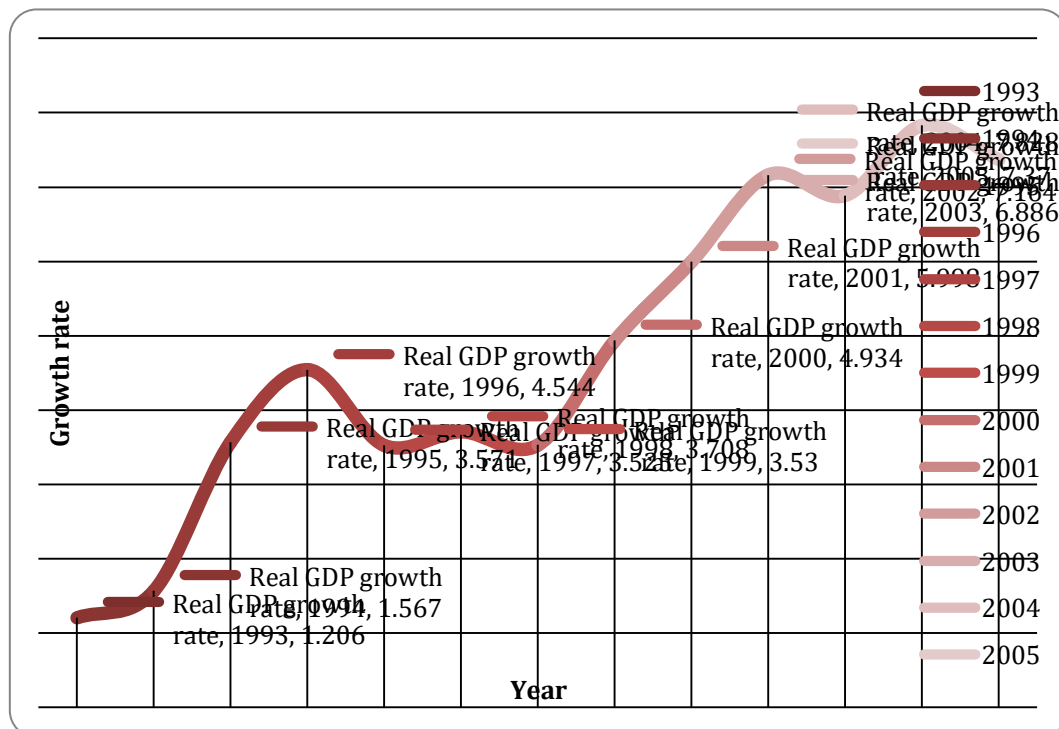
Figure 2.3: Real GDP Growth Rate from 1993-2005
Source: Author (World Bank data)

From Figure 2.2, selected financial indicators M2/GDP, Liquidity liability/GDP and credit to privates sector demonstrates decline trends and starts to potray proper upward trends from year, 2001 while in Figure 2.3, the real GDP growth rate exhibit upward trend up to 1995 and then experience a decline in 1996 and maintain it up 1999. From 2000 and onward experience upward trend. The decline trends demonstrated on Figure 2.2 and Figure 2.3 reflected newness of the policies implemented following to the liberalisation financial sector for the first time and it seems environment was still not friendly to the operation of financial sector based on market principles despite libaralizing the economy from1986.

2.5.2 Second Financial Sector Reforms 2006 to 2012

Despite the implementation of first financial sector reforms, still there were shortcomings in the operation of financial sector in Tanzania, some of them were brought by globalization process and more importantly the contribution of financial sector apart from previous efforts undertaken was small to the economy as compared to other countries. This necessitated to the second financial sector reforms which marked its beginning from 2006 for addressing the remaining bottlenecks and challenges that persisted in the financial system (BOT, 2011). These reforms had ten broader areas focusing on promoting efficiency, competition, and enhancing access of financial services. They included legal and judicial reforms, monetary policy reforms, banking sector reforms, insurance sector reforms, micro and rural finance reforms, pension sector reforms, developing financial markets reforms, land administration reforms and reforms on facilitating for provision of long-term development financing.

Impacts of the reforms for the selected indicators as indicated by Figure 2.4, financial indicators (broad money supply to GDP, Liquidity Liabilities to GDP and Credit to private sect to GDP) as well as Savings to GDP, and domestic investments to GDP in general continued to exhibit upward growth patterns with small fluctuations mainly attributed by increased competition in the banking sector and reduction in risk premium of lending private sector following to the implementation of financial reforms, contrary to the declining trend patterns we saw at early years of after introduction of first financial generation reforms, though for the period between 2008-2009 growth rate of all indicators seemed to be small (modest), probably suggesting the effects of global financial crisis in the Tanzanian economy and the way ant-cyclical measures/ responses were undertaken by responsible authorities to mitigate pressures of global financial crisis which caused domestic credit to private sector to GDP and gross domestic investments to GDP to drop down by 1 percent from 2008- 2009, broad money supply to GDP and savings to GDP remained constant with 17 and 19 percentages respectively for each respective year, while Liquidity Liabilities to GDP increased only by 1 percent as presented on Figure 2.4.

From the Figure 2.5 the real GDP growth rate continued to be well sustained but in year 2009 growth rate went down by 1 percent, its rise again by rate of 1 percent to 7 percent of annual real GDP growth rate in 2010. From 2011 growth rates went again down by 0.6 percent and recorded annual growth rate of 6.4 while in 2012 rose up by rate of 0.4 to 6.8 percent. The down turn on growth rates of real GDP reflects global financial crisis that affected Tanzanian economy contributed to the reduction of

domestic credits allocated to privates sector by 1 percent and decline of domestic investments by 1 percent which consequently slowed down the growth rate.
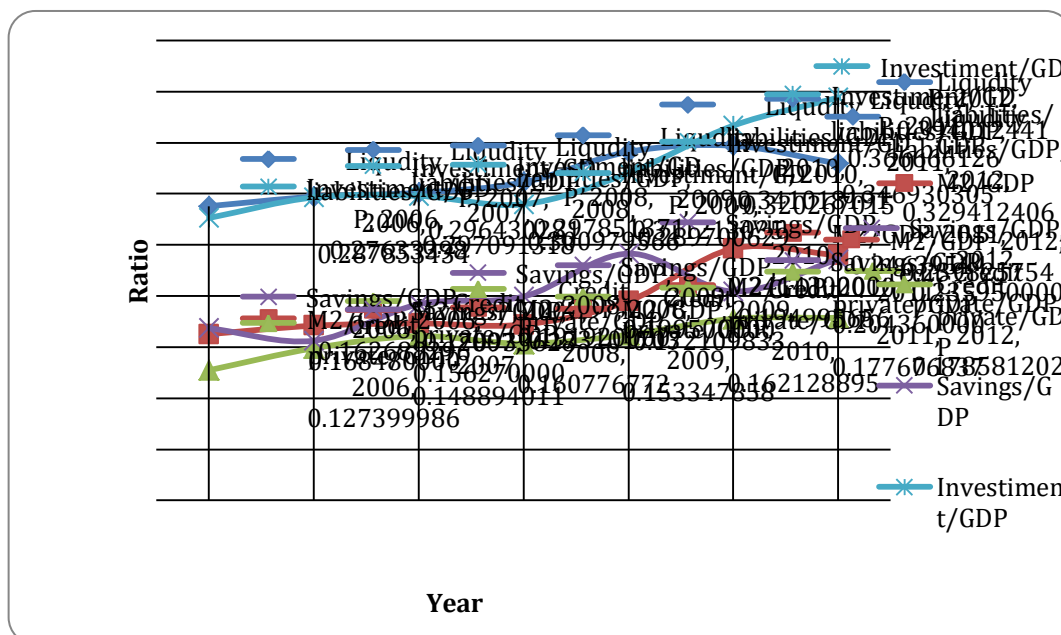
Figure 2.4: Trend of Selected Indicators 2006-2012

Source: Author (IMF Data)
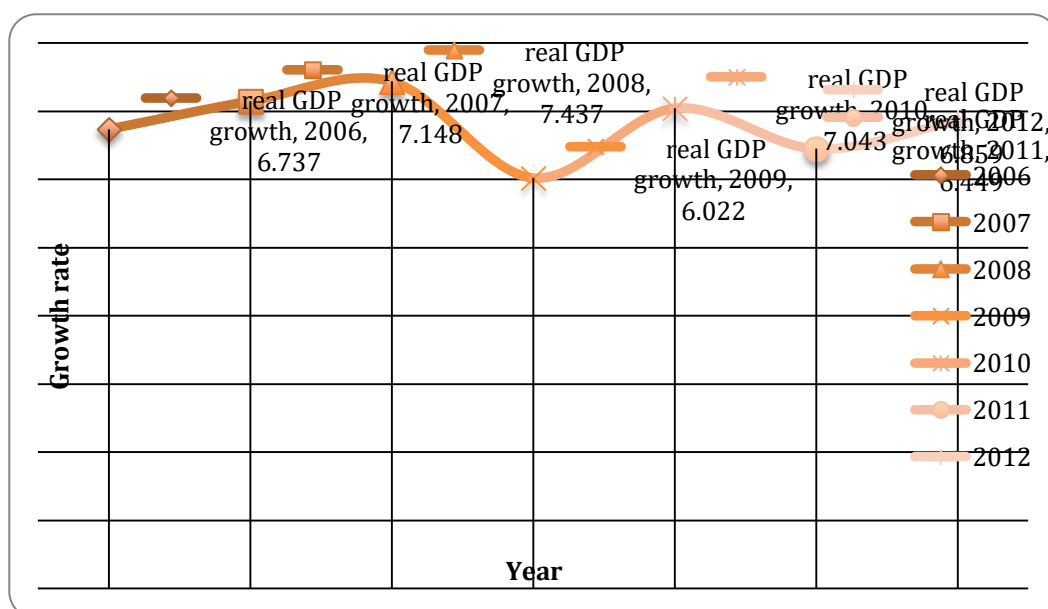
Figure 2.5: Trend of Real GDP Growth Rate from 2006-2012

Source: Author (World Bank Data)

In general, following the financial reforms, the Tanzanian financial sector has undergone some structural changes in terms of policy environment, number of institutions, regulatory framework as well as ownership structure. As at 2013 number of commercial banks stood at 33 while microfinance taking deposits were 2 and other non deposits taking institutions registered were 17 (IMF data, 2013). In contrast with 3 commercial banks recorded at independence times. Contribution of financial sector to GDP has increased to 1.8 percent from 1.6 percent in 2006 (BOT, 2014) and proportion of population accessing financial services has increased, in banking products to 14 percent, non banking formal products Institutions 44 percent, informal 16 percent and excluded 26 percent of total Tanzanian population.

However, the large increase on access of non-banking formal products attributed largely by widespread of mobile money usage (Fin scope 2013). The present access strand findings are in sharp contrast with Finscope survey results of 2009, where access to formal banking services was only 12 percent, formal other/non banking 4 percent, excluded 56 percent and in informal financial institutions was 28 percent.

While substantial progress on the financial sector has been recorded in Tanzania from reform period to the present time as indicated above, downside financial sector is still shallow and narrow when compared to its comparable countries such as Kenya and in fact is underdeveloped. Mkulo (2008), credit growth to private sector to GDP is only 16 percent as in 2008; this is relatively lower when compared with 30 percent in Kenya. IMF (2010), domestic deposits to GDP in Tanzania was 24 percent lower than recorded in Kenya 38 percent as in 2008. The financial development report (2012) measuring development of financial sector in the best world financial

systems on aspects of seven pillars covering 62 countries, ranked Tanzania 60th fairly below Kenya and Ghana with rank 54th and 56th respectively, major constraints being limited access to financial services, narrow services from both banking and non banking institutions, poor regulatory and legal systems and business environment.

Furthermore, the Tanzanian financial sector is still featured by insignificant developed lease institutions, housing institutions, hire purchase and retail credit markets, while long term financial markets still remains underdeveloped with small and weak contractual saving institutions and relatively small stock exchange established in 1996 (Odhiambo, 2011). As a result money and capital markets intermediaries such as brokers, discount houses, and merchant banks are underdeveloped (Falle, 2013). In order to eliminate the remaining bottlenecks and develop financial system that benefits large proportion of population and poor in particular may necessitate implementation third generation reforms and specifically focusing on addressing issues of property rights.

From this historical review presented above, one can learn that the economic performance of Tanzania was affected by government policies and especially in the financial sector that determined allocation of resources to private and public sector. The larger the role-played by private sector the larger the economic performance of the economy. Development of financial sector has been critical to the development of private sector and therefore economic growth. It is the main thrust of this study to test the causality relationships between financial development and economic growth in Tanzania throughout the past three decades.

CHAPTER THREE

LITERATURE REVIEW

3.1   Introduction

This chapter began by reviewing relevant theories related with financial system and economic growth in section one, then present link between financial development and real sectors of the economy in section two and skepticisms over financial system and economic growth in section three, it followed with empirical reviews in section four and in the last section present summary of the chapter.

3.2   Theoretical Reviews Financial Systems and Economic Growth

Considering economic growth theories, the most well known economic theory (model) to investigate outputs dynamics is the Solow model. Robert Solow developed this model in the late of 1950s. The model states that "once an economy attains its equilibrium level of output, growth rate of population and technology are the sole determinants of output growth" (Valickova, 2012). As time went on other economists emerged and criticized the theory in that, countries are heterogeneous in more than the two determinants of output growth presented and it was noted that Robert Solow theory managed to explain only small part of economic growth of a specific country. Also, with the passage of time other models involving more than two determinants' such as, human capital accumulation, technology, propensity to save, and growth rate were developed. However, these theoretical models omitted one important determinant, that is the level of country's financial development due to its' nature of complexity (Sindano, 2009 and Valickova, 2012). It is similarly with other determinants of economic growth, that once true causality and directional

effects of financial development in economic growth has been determined and being understood, economic policy can be shaped to approach the desired level of economic growth more efficiently (Valickova, 2012). In this case poor countries can ketch up faster; the developed countries and developed one will continue to enjoy stable economic growth.

The hopes of having equation type or model that could explain financial development as an input factor in economic growth materialize following the emergence of endogenous growth theory. The modern growth theory developed over last twenty years recognizes financial development as important determinant of economic growth. It is contrary to Solow model, that in the new theorists, sources of growth are determined endogenously among others supporters include, Pagano (1993), Greenwood and Smith (1997) both have presented models in which both capital accumulation and growth are endogenously determined. Let us consider a simple endogenous growth model presented by Pagano (1993) – the AK model, that aggregate output is the linear function of capital stock.

$$Y_t = AK_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (1)$$

For simplicity Pagano assumed, population is stationary and that the economy produce single good and can be consumed or invested. If invested it could depreciate at the rate of δ per period, then gross investments equals

$$I_t = K_t + (1 - \delta)K_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (2)$$

In a closed economy with no government, capita market equilibrium requires gross saving S_t equals to gross investments I_t. For reasons that will be made clear below it is convenient to assume that a proportion (1-ø) of the flow of saving lost in the

process through financial intermediation. In this case only parts of saving that will be allocated to investments is $\emptyset S_t$, thus

$$S_t = I_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (3)$$

$$\emptyset S_t = I_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (4)$$

At time (t+1) growth rate is given by; δ

$$g_{t+1} = \frac{Y_{t+1}}{Y_t} - 1 = \frac{K_{t+1}}{K_t} - 1 \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (5)$$

$$K_{t+1} = I_t - (1 - \delta)K_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (6)$$

Replacing K_{t+1} with its value, is given as

$$g_{t+1} = I_t - (1 - \delta)K_t / K_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (7)$$

$$g = \frac{AI_t}{Y_t} - \delta \quad \leftrightarrow g = A\emptyset S - \delta \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (8)$$

Growth rate (g) equals to marginal productivity of capital (A), rate of savings and the proportion of savings channeled to investments ø **minus δ.** From this model we can conclude, it is unlike the Solow model, that both savings and productivity of capital affect long-term economic growth positively. Also the remaining fraction (1- ø) which can be considered as tax imposed by government in form of reserve requirement, transaction taxes etcetera, as suggested by Roubin and Sala -i- Martini (1992), may also reflect X-inefficiency of intermediaries and their market power. Therefore, if one can reduce the linkages of resources, that rises saving rate ø and it also increases growth rate (g) in equation 7.

Greenwood and Jovanovic (1990) developed a model in which both factors of financial intermediaries and economic growth were endogenous. Their study found

positive relationship between financial development and economic growth. From one side financial intermediaries improved the efficiency of investments and from another side economic growth helped financial markets to update to new structure.

Further Levine (1991) considers an endogenous growth model with stock markets which shows that, they accelerate growth for two reasons: First because ownership of firms can be traded without disrupting the production process, Second, because agents are allowed to diversify portfolios. The implication of this model is that, in the absence of stock markets, agents would be discouraged to invest because of risk aversion. Also they accelerate growth directly by eliminating premature capital liquidation which increases firms' productivity and indirectly by reducing liquidity risk which encourage firms' investment.

Berthelemy and Vardoulakis (1996) used learning by doing point of view to analyze relationship between financial development and economic growth. They found that financial sector has positive influence in promoting development real sectors such as primary industry, and then, the real sector developed had more surplus money, so they will have more savings in banks, which also have positive influence on development of financial sector.

According to Levine (1997), early studies investigated finance-growth story did not amalgamate all of the financial functions into their stories of finance and development. They have explained individual functions and were not detailed. Theory suggests that financial arrangements, markets and financial institutions arise to mitigate the effects of information and transaction costs. However, if the world

was perfect with no transaction, or information costs, there would be no need for financial system (Kenneth Arrow (1964) and Gerard- Debreu (1959) as cited in Valickova (2012). When financial arrangements, markets, financial institutions arises to ameliorate information and transaction costs financial systems serve one primary function of allocation of resources across space and time in a certain environment (Merton, Bodie 1996). The primary function Levine (1997) categorized into five basic functions which includes, mobilizing savings, facilitating exchange of goods and services, facilitate trading hedging, diversification and pooling risk, evaluate managers and exert corporate control, acquiring information and resource allocation

Financial system affects economic growth through these five functions. There are generally two recognized ways or channels used to demonstrate how financial system can affect economic growth that is through technological innovation and capital accumulation. In capital accumulation growth based models, functions performed by financial system can affect economic growth by influencing rate of capital accumulation through either altering saving rates or reallocating savings among different producing technologies while in technological innovation growth models, focuses on inventions of new production process and goods, in these models functions performed by financial system can affect economic growth through technological innovation.

Apart from these two widely recognized channels as Levine (1977) demonstrated, extension has been made by some recent studies to incorporate shock absorber as another channel which again explain how financial systems can affects economic development and among supporters includes Coricelli (2008), Cerra and Sexena

(2008). According to Coricelli (2008), financial system can serve as shock absorber in the period of adverse economic shocks. The major argument in this channel is that, during good times, firms rely on finance alternatively to the banking sector of the country, mainly trading credits and retained earnings. Thus, availability of outside finance does not seem to be a binding constraint for firms 'expansion during good time, however, such inside forms of financing increases the likelihood of the chain effects called negative shocks to a company as may be transmitted to the trading partners. Such chain effects induce breakdown of both credits and production chains, resulting to sudden and sharp fall of outputs. In such situation banks comes to provide aid by providing loans to temporally illiquid companies, thus preventing the spread of negative shock from one company to the rest.

To prove existence of the channel as mentioned above Coricelli investigated the impacts of financial development on the magnitude of output falls in both developed and emerging markets from 1963 to 2003, results provided indicates that, countries with more developed financial sectors display output falls well below the average, when negative shocks occur.

Other recent study in line with this view is Cerra and Sexena (2008) who demonstrated that the implications of sharp falls in output are long –lasting as they are accompanied by future low economic growth rates. Thus according to this view, building deep, liquid and internationally integrated financial markets is of principle importance and a way how to avoid a sharp and persistence falls in output. The implication of this channel is much pronounced in emerging markets where the level of financial development tend to be lower and countries suffer on average from

higher output contraction which further hinder long term economic prosperity. For the purpose of creating comprehensive understanding, I present theoretical approach to finance and economic growth sources, the remaining part concentrate in brief explaining five basic functions, which at least are theoretically connected with economic growth based on Levine 1997. Coricelli (2008), Cerra and Sexena (2008) and Valickova (2012) and the way financial sector has been linked with real sectors of economy, further provide criticisms against financial system and economic growth and finally empirics before conclusion.
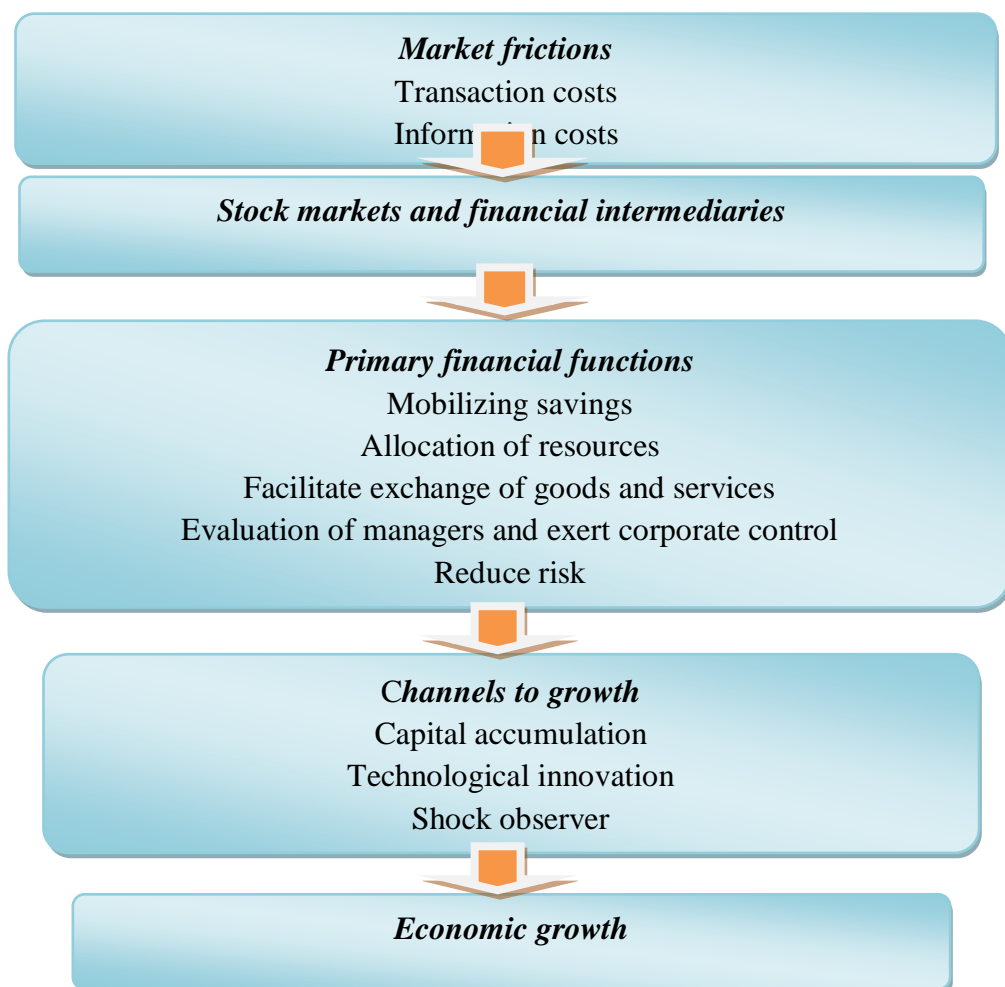
Figure 3.1: Theoretical Approach to Finance and Economic Growth Source
Source: Levine (1997), Coricelli (2008), and Valickova (2012)

3.3 Functions of Financial Systems

3.3.1 Mobilizing Savings

Mobilization of savings, involves agglomeration of capital from disparate savers for investments. However to be able to do that it is very costly because there is transaction cost associated with collecting savings from different individuals, and overcoming informational asymmetry associated with making savers feels comfortable in relinquishing control of their savings. With information and transactional costs associated with mobilizing savings, numerous financial arrangements, and financial institutions will be required to mitigate the frictions and facilitate the pooling. As financial institutions emerge, they will pool savings from individuals and invest in promising projects, which in turn will affect economic growth. (Bagehot, 1873), argued that ''the major difference between England and poor countries in the mid 1800s was that, in England the financial system could mobilize resources for immense works.'

3.3.2 Acquiring Information about Investments and Resources Allocation

It is difficult and costly to evaluate firms, managers, and market conditions by individual' savers as they may not have capacity, time and means to process the required information. Thus, information-acquiring costs create incentives for emergence of financial arrangements, markets and financial institutions. Levine (1997) financial institutions may collect information for project investments' than individuals' thereby improving resource allocation which faster economic development. To explain it clearly, he assumed presence of fixed cost of acquiring information about production technology.

According to him, without financial intermediaries each investor must pay fixed cost. In response to this information cost structure, however group of individuals may form financial intermediaries to economize on costs associated with acquiring and processing information about investments opportunities. Instead of each individual acquiring evaluation skills and conduct evaluation, all activities will be done by financial intermediary. When economizing information costs, they improve resource allocation, which is positively related with economic growth.

3.3.3   Monitoring Managers and Exerting Corporate Control

In this role financial system is basically tied with economic growth in the way it reduces costs of monitoring investments projects and how it helps to solve principal agent problem by aligning interests of managers and owners. Levine (1997) demonstration assumed it is costly for outsider's investors in a project to verify project returns, this create market frictions which can motivate financial development. Insiders have incentives to miss present project returns to outsiders.

Given the verification costs, however it socially inefficient for outsiders to monitor all aspects of the project, thus the optimal contract between the two parties will be debt arrangements and specifically there will be equilibrium interest(r), when the return will be high the insider pays the outsiders and outsiders do not monitor and when default due to insufficient returns, the outsiders increases cost of evaluating returns of the firm (insiders). Verification costs reduce investments decision and economic efficiency. Thus, with availability of financial contracts and Collaterals, lowers monitoring and enforcement costs, and reduce impediments to efficient investments with their corresponding implications on economic development.

3.3.4   Facilitate Exchange of Goods and Services

Besides, the good role of mobilizing savings, financial arrangements that lower transaction costs can promote specialization, technological innovation and growth. The theoretical links between facilitating transaction, specialization and economic were core elements of Adam Smiths' (1776) *wealth of nations.* According to Smith (1776) division of labour specialization is the principal factor underlying productivity improvements. Thus, greater specialization can permit inventions of machines or production processes, which may increase efficiency and significantly contribute to the improvement of productivity and economic growth.

Smith also argued that the lower transaction costs, the greater will be the specialization because specialization requires more transactions than autarkic environment. Also Greenwood and Smith (1997), specialization requires more transactions and because each transaction is costly, the financial arrangement that lowers transaction cost will facilitate greater specialization.

3.3.5   Reduce Risk

With environment characterized by market frictions, financial arrangements, markets and financial institutions arises to ease trading, hedging and pooling risk. There are two types of risk involved, liquidity and idiosyncratic risk. According to (Levine, 1997), Liquidity is the ease and speed which an agent can convert assets into purchasing power at agreed price. It normally arises because of uncertainties associated with converting these financial assets into medium of exchange. Information asymmetries and transaction costs may exist and thus can intensify liquidity risk; therefore market frictions create incentives for the emergence of

financial markets and institutions that augment liquidity. Bencivenga and Smith (1991) argued that, by providing demand on deposits and choosing appropriate mix between liquid and illiquid investments, banks provide complete insurance to savers against liquidity risk and at the sometime facilitate long run investments in illiquid high returns projects. Banks can replicate the equilibrium of allocation of capital that exists with the observable shocks. Therefore by eliminating liquidity risk, banks can increase investments in the high return illiquid assets and hence accelerates economic growth.

3.4 Link between Financial Development and Real Sectors of the Economy

Although the early pioneers investigated the finance- growth story like Bagehot (1873), Schumpeter 1911, Gold smith, (1969), Mackinnon-Shaw (1973), and others, clearly they come to explain the role of financial sector on economic development, they did not provide clear concrete transmission mechanisms as to how does financial sector development impact real sectors of the economy (Ejumuson, 2009). In the field of economics real sectors of the economy comprises household consumption, domestic investment, trade (export and import) and government expenditure which can be presented in a form of equation as;

$$Y_t = C_t + I_t + (X_t - M_t) + G_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (7)$$

Where,

Y_t = Gross domestic product, C_t = House hold consumption , X_t = Export,

M_t = Import G_t = Government expenditure I_t = Domestic investments .

The independent variables from the equation affect positively the real sector of the economy. Recently studies have taken into account the transmission mechanisms by

relating financial development and real sectors of the economy as presented from just below.

3.4.1 Financial Development Improves Household Consumption

Households purchases goods and services for their own consumption and when purchases, make payments through financial system and especially on purchase of durable and capital goods. By mobilizing savings from different household, financial system help household to purchases assets, houses, start new business, insure them against income shock and so on. In so doing financial system, improves welfare of household and especially those with access with financial services. Study by Claessens and Feijen (2006) finds financial development and household consumption are highly correlated.

Further, study pointed out that causality between financial development and household consumption is less clear than in the case of income, there is evidence that financial development is a leading indicator for increasing household consumption. To confirm their findings, study estimated the elasticity of household consumption with respect to private credit for the period between 1980-2004 and concluded that if private credit increases by 1.6 percent annually in the next 10 years world household expenditures will range between 1.1 percent and 36 percent which is higher than the current level.

3.4.2 Financial Development Promote Investments

Finance matters for investment because it allocates capital to private sector. Among major constraint facing business in all over the world is finance apart from taxes and

regulations (Ejumuson, 2009). Betra et al (2003) ranked lack of finance as the main constraint in Africa and China. Finance needed to finance investment depend on the financial system in place, for instance if it is well developed access to finance by firms, and individuals who wants to established business will be quite easy and the opposite situation will prevail with less developed financial system. Lensink et al (2003) explained relationship between financial development, foreign direct investments and economic growth; they argued that financial system of a recipient country is an important precondition for foreign direct Investment (FDI) to have positive impact on economic growth.

Further study pointed out that, a more developed financial system positively contributes to the process of technological diffusion associated with foreign direct investments (FDI). That, foreign direct investments may involve transfer of technology through importation of capital goods embedded through financial system can lead to the improvement of total factor productivity and economic growth of a country.

Lyare and Moore (2009) concluded in their research on four countries Barbados, Jamaica, Singapore, and Trinidad and Tobago, that extra developed financial system promote or direct economic growth because they support in mobilizing savings and help in investments. In addition foreign direct investments boost economic growth rate through helping to improve marginal output of capital and increasing the support of savings allocated to investments. Love Innessa et al (2005), study on financial development and dynamic investments behavior findings confirmed, financing constraints are significantly larger in countries with less developed financial system.

Study underlines role of financial development in improving capital allocation and growth.

3.4.3 Financial Development Improves Trade

Financial development facilitates transactions in the economy and in so doing; it improves trades trade at domestic and international levels. It also makes financial transactions reliable and friendly to the trading environment. It facilitates domestic and international payment systems. Experience demonstrates that countries with well-developed financial system and trade openness have experienced significant improvements in growth rate.

Therefore financial development and trade openness reduce inefficiency in the production process and positively influence economic growth. This argument is strengthened by the fact that growth rate in countries with trade openness and financial policies outperformed with those with restrictive financial and trade policies (Levine 1997, Ndulu et al, 1996).

Humphrey (2001) conducted study on different types of payment system and suggested that, many countries and even developed one are still using paper payment system, while would have benefited much by using electronic payment system. Study sited USA as one country, which would have saved 1 to 1.5 percent of its GDP if it were to migrate to electronic payment system. Also, in Nigeria, Chimobi (2010) found money supply was the only financial development indicator that was seen to cause trade openness for Nigeria, implying financial sector development improved trade by facilitating transactions in Nigerian economy.

3.4.4   Financial Development Improves Public Sector Development

Governments achieve its objectives by spending a lot of money on social, political and economic activities. Thus significant change in efficiency of public expenditure is more likely to affect the GDP and achievements of the objectives (Ejumuson, 2009).

Claessens and Feijen (2006), argued that a large liquid government bond markets could help the governments to raise capital; for financing infrastructures and its budget but it is only possible if there is wise use by the government and if not, may result to financial crisis. Their study emphasizes that financial development through bond markets may help to improve public sector by providing finance for financing different activities or services such as on infrastructures constructions, health, education, agriculture and other development issues but has to be used efficiently because its misuse will likely to cause financial crisis.

3.5   Skepticism Over Financial System and Economic Growth

Despite the range of services provided by financial system for economic growth one should not always expects positive association between financial systems and economic growth and particularly when these five functions are performed poorly. According to *Global financial development report 2013*, when financial systems perform poorly, it hinders economic growth, curtail economic opportunities, and destabilize the economies. These consequences normally are caused by inefficient regulation. However, with consideration in mind that financial system has both

supportive and destabilizing effects; the key issue here is to have strong and efficient regulations in the financial system.

3.6   Empirical Reviews

Having established theoretical links between financial development and economic growth, this part presents empirical evidences available. The relationship between financial development and economic growth has not only been subject to the considerable debate in the literature of development and economic growth but also of principal interest for economists and researchers. First studies searching relationship between the two variables were conducted by Bagehot (1873) and Schumpeter (1911). Bagehot (1873) claimed that, large well-organized capital markets in England enhanced resource allocation towards to more productive investment (Huang, 2010).

In his study Schumpeter (1911) financial sector is paramount in promoting economic growth (Hussein and Chokrabaty 2012).   Also Schumpeter (1912) indicated smoothly running economy would support investors economically by providing the finance of technological innovations that was necessary for producing the new products the most effectively and productively. He expressed that; the growth of financial sector especially the growth of banking sector was necessary for economic growth cited (Mercan1, et al, 2012).

Following these two greatest pioneers, numerous empirical studies have been undertaken attempting to examines the existence of the relationship, the direction of causality between the two variables using cross country studies but, most of their findings especially on the direction of causality are of full ambiguity due to various

econometric problems such as potential endogenity which in fact did not satisfactorily address issues of causality, homogeneous assumption in their regression models that, treating many countries as homogeneous entities, due to this oversights estimates are likely to be biased and by the fact that countries differs in many aspects. Time dimension also was not taken into account in their analysis. Thus, findings obtained from these early studies though shaded light but, may lead to incorrect policy advice in a specific country as countries are heterogeneous in many aspects including levels of financial development and therefore this assumption is enough to rule out their results. (Ang, 2008) suggested that, researchers 'while dealing with finance growth nexus should concentrate on specific studies in order to relate the findings with policy designs.

In general empirical literature has been characterized by four streams of thoughts related to the direction of causality between financial development and economic growth. The first is supply streams of thoughts, which states that, financial development causes economic growth. In this view researchers believe financial development has positive impact on economic growth. This implies that deliberate decisions to create financial institutions and markets increases the supply of financial services and thus leads to real economic growth. Among other supporters of this view it includes the early works by Shaw (1955), Gold smith (1969) and Hicks (1969), as cited by Ang, (2007), Patrick (1963), and Latter on by Mackinnon and Shaw (1973) to more recently by Hussein, and Chakrabarty, (2012). In general they have argued that development of a financial system is crucially important for stimulating economic growth and underdeveloped financial system retards economic

growth. This view had policy implications that focused on formulating policies aimed at expanding financial services for fostering economic growth.

The second line of views, growth lead finance (Demand following view hypothesis). This view was developed by Robison (1952), and according to him finance follows economic growth or where enterprise leads finance follows economic growth. In this view researchers believe that, it is economic growth, which causes financial sector development. In other words, causality between financial development and economic growth runs only from economic growth to financial development.

The idea behind is that, when an economy in a particular area expands demand for certain financial instruments and arrangements, and in response to the increasing demand structure by financial institutions certain type of financial institutions and financial markets will emerge and hence leading to the growth of these services (financial services) and finally financial development. Other empirical studies in line with this view are Fredman and Schwarz (1963) and Demetrides and Hussein (1996). This view had policy implications focused on formulating policies that are aimed at promoting growth of real sectors of economy for fostering financial development.

The third one is hybrid view or feedback causality or the bidirectional causality views between financial development and economic growth. In this view researchers believe existence of compliment causality, that there is causality from one another between financial development and economic growth. Environment that has been considered is that, under well-developed financial system in a country economic growth could be promoted through technical changes, innovations and products and service innovations Schumpeter (1912). This in turn will lead to high demand for

financial arrangements and services Levine (1997). In the course of response from banking institutions to meet the increasing demand, this will stimulate further economic development hence provide feedback causality or two-way causality. Among other empirical works, supporting these arguments includes Greenwood and smith (1997).

Fourth view worth discussing follows Robert Lucus view (1988), he argued that financial development and economic growth are independently causally related in other words, it is based on the idea that, financial development does not causes economic growth and vice versa.(the two variables are independent of each other). Lucus further stated that *economists badly overstress the role of financial variables in economic growth*. This view does not attribute that; finance has any role on promoting economic growth and vice versa (Valicuva, 2012). Also some development economists' pioneers have expressed their skepticism about the role of financial systems in economic growth by just ignoring it (Anand chandayarkar 1992). For example Nicholas Stern's (1989) review of development economics does not discuss financial system, even in a section that lists omitted topics as cited by Levine (1997).

African empirical literature study surveyed fall within the four streams of thoughts as presented above. Starting with studies undertaken in other parts of Africa than Tanzania, they includes, Eita and Joan (2007) conducted empirical study on causality analysis between financial development and economic growth in Botswana for the period 1977 to 2006 using Granger causality test through cointegrated Vector Autoregression methods. Findings confirmed causality runs from financial

development to economic growth implying that financial intermediations and institutional reforms should be further enhanced to promote Botswana's economic growth. Also Odhiambo, (2008), examined the direction of causality between financial development and economic growth in Kenya through dynamic Granger causality test model using three proxies of financial development and real GDP percapita on economic growth. The empirical results revealed that, although the causality between financial development and economic growth in Kenya is sensitive to the choice of measure for financial development; on balance the demand following response tends to predominate.

A study also by Sindano, (2009), the direction of causal relationship between financial development and economic growth in Namibia for the period between 1998-2007 using cointergration and Vector Error Correction Model (VECM) to establish long run relationship and then applied Granger causality test to establish direction of causality, the results confirmed demand following approach. Causality runs from economic growth to financial development, implying the real sector of the economy should be further developed for stimulating further development through policy interventions.

Again a study by (Aknilo and Agebetunde, 2010), examined the long run causal relationship between financial development and economic growth for ten countries in sub-Saharan Africa. using the Vector Error Correction Model (VECM). The results showed that financial development Granger causes economic growth in Central African Republic, Congo Republic, Gabon, and Nigeria while economic growth Granger causes financial development in Zambia. However, bidirectional relationship

between financial development and economic growth was found in Kenya, Chad, South Africa, Sierra Leone and Swaziland. The study concluded that growth enhancing policies should be emphasized in countries with demand following hypothesis, and finance enhancing policies in countries with supply hypothesis, whereas in countries with bidirectional causality balanced policy is required to promote both financial sector and economic growth.

In Tanzania studies of this nature are almost limited (Odhiambo, 2011, Christine Falle 2013). Specific notable studies includes, Akinboade (2000), who investigated the relationship between financial development and economic growth in Tanzania using ratio of bank deposits liability and real GDP percapita income through static ordinary least square (SOL) and dynamic ordinary least square (DOLS) estimation techniques. He conducted his analysis into two periods, before liberalization 1966-1981 and after liberalization 1982-1996 and provided two conclusions: First, financial development was negatively related with economic growth and significant (in the 1966-1981) and second conclusion, was that, the two variables are independent in the period between 1982-1996 as cited by (Gin and Ndiege 2013).

Financial development has different dimension, there is no single variable that can measure and capture all aspects of financial development as used by Akinboade (2000), and besides bank industry measures are not appropriate measure since financial system is not only about banks (Global financial development report, 2013). Also, the use of static ordinary least square (SOL) and dynamic least square (DOLS) are subjected to asymptotic bias because does not fully correct for the second-order asymptotic bias effects of cointegration, since a "truncation bias"

always remains, (Panopoulous et al, 2004). Odhiambo (2005) conducted an empirical study on financial development and economic growth in Tanzania for the period 1960 to 2005 using vector error correction (VEC) and co-integration model. Study used three financial proxies broad money supply to GDP (M2/GDP), currency ratio, and ratio of private bank claims to GDP and real GDP percapita on economic growth.

Findings, when ratio of broad money to GDP was used financial development leads to economic growth but, when the other two are used, depicted bidirectional causality – although supply leading responses seemed to predominate, implying financial sector should be further developed to monetize the economy. The use of VECM through cointergrated model alone to establish direction of causality needs some higher degree of caution since the results are hard to interprets and sometime may be misleading if one has not done it with greater caution unlike using granger causality test which is simple to use and provide responses for both small and larger sample. Currency ratio reflects currency in circulation and has no strong link with growth and private credit from bank, is not the only component providing credit to private sector as regarding to the current Tanzania financial system. Study ignored other important components of financial system for example non-banking institutions role in the Tanzanian economy.

Also, Mbellenge and Aikaeli (2010) study on the causal relationship between financial development and economic growth in Tanzania. Study applied cointergration and Vector error correction techniques for the period between 1980-2010 using ratio of broadly money supply (M2) to nominal GDP; and credit to

domestic private sectors to nominal GDP as financial development indicators and Economic growth proxied by gross domestic product (GDP). The Granger causality test indicated, causality runs from financial development to economic growth. Major weakness, study does not establish what links the two variables for the direction of causality confirmed because both variables (financial development and economic growth) can be driven by variables such as savings, investments and trade etc. It rather assumes existence of such mechanisms that links the two variables without testing on the way to establish the direction of causality.

Odhiambo, (2011), Financial deepening, capital inflows and economic growth nexus in Tanzania in trivariate Model through Autoregressive distributed lag (ARDL) bound test procedures for the period 1994 -2005 using M2/GDP and foreign capital inflows (FCI) and real GDP per capita on economic growth indicators. The study concluded that financial development in Tanzania follows growth irrespective of whether the causality either is estimated in static or dynamic formulation. Granger causality test based on autoregressive distributed lag (ARDL) model in fact is the newly techniques. The present study uses granger causality test based on vector error correction model (VECM). The difference between the two techniques is that, granger causality test based on autoregressive distributed lag (ARDL) cointergration analysis is taken without regarding series of the variables are either stationary or not or order of integration while granger causality based on VECM variables must be stationary and integrated in the same order.

This study will try to relate the results with those from autoregressive distributed lag (ARDL) to see whether econometric techniques influences the direction of causality

in Tanzania even though some indicators and time under study are different but, for the similar variables the results will be stated.

(Gin and Ndegien 2013) studied role of financial sector in economic growth found two ways results between the two variables using deepening indicators from saving, and credits cooperative societies to GDP and real GDP percapita through Newey-west standard error response model and warld granger causality test in their analysis. The use of Newey –west standard errors response model has one advantage that, it corrects autocorrelation and hetrescedasticity which is the problem facing many researchers   but the technique is strictly to larger samples and if the sample is small can perform worse even than the OLS (Gujarati, 2003). (Gin and Ndegien 2013) sample had only 21 observations from 1990-2011 while (Gujarati, 2003, p, 485) sample is said to be reasonably large if let say has 50 observations or more. Also optimal lag length selection is another problem because there is no prior test as in VECM.

Christina Falle (2013), studied financial development and economic growth in Tanzania. Her study used Engle and Granger cointergration techniques and granger causality test under Vector Auto regression (VAR) framework for the period between 1988-2012. Study used three financial indicators domestic credit to private sector/GDP, M3/GDP and Bank deposit/GDP and economic growth was proxed by real GDP. Findings confirmed bidirectional causality between financial development and economic growth in Tanzania. Its analysis conducted in bivariate framework and one of its major weaknesses is misspecification bias and further causality results examined only within the estimated sampling period and beyond sampling period,

study is silent about causality results between financial development and economic growth.

Although present study uses granger causality test through cointergrated VAR methods as used by some previous studies in Tanzania but this depart from the existing in the following ways, as it uses longer time series data from 1980-2012. Abu Quarn and Abu-Barder (2008) noted that the relationship between financial development and economic can be clearly well captured when data used is sufficiently long enough. To the level of our knowledge 33 years, are enough to allow meaningful analysis and interpretations to be undertaken. Study further explore channels in which Tanzanian financial sectors causes economic growth and vice versa because most of studies examined causality based on financial measures that may not capture mechanisms through which financial development causes economic growth or economic growth lead finance such as through enhancing efficiency.

In addition to that, the bivariate framework which has been commonly used to investigate the direction of causality suffer from model misspecification bias and does not allow one to establish channels of which financial development lead to economic growth or economic growth lead finance (Ang 2007). Besides that, from the surveyed literature, causality in Tanzania has been examined within the estimated sampling period. It is therefore not clear also if beyond the estimated sample period there is causality or not between the two variables.

To establish the direction of causality with well defined specific channels and solve problems of variable omission/ model specification biases as reported on previous studies, present study adopt multivariate framework by involving six variables,

financial variable is captured by three indicators broad money supply to GDP (M2/GDP), Liquidity liabilities to GDP and domestic credit to private sector to GDP. Other variables are savings to GDP, domestic investments to GDP and real GDP per capita). Further, study employs variance decomposition (VDC) to evaluate strengths of the findings from granger causality test outside the estimated sampling period, which has not been the case for the observed studies in Tanzania.

3.6   Summary

The chapter has discussed two major aspects theoretical and empirics on the relationship between financial development and economic growth. In theoretical aspects, financial system/ sector affects economic growth through functions that are part of financial system through capital accumulation, technical innovations and shock absorber. Empirical literature has been dominated by four streams of thoughts as demand following view, supply view, feedback and independent causality and yet there is no consensus on the results of the causality obtained by economists. Specific studies like this are important for designing specific policy for developing financial sector and economic growth of a specific country.

CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY

4.1   Introduction

This chapter start with, theoretical underpinnings in section one, then model specification in section two, it followed with model variables, and data sources in section three and four while, section five presents econometrics procedures used to answer study objectives and the last section provide chapter summary.

4.2   Theoretical Underpinnings

Ever since postulation of proposition that financial development causes economic growth by the early pioneers such as Begehot (1783), Schumpeter (1911), and other proponents of this view, different theoretical models have been developed attempting to explain how finance causes economic growth but the most famous and influential model, was that Mackinnon –Shaw (1973). Their model believed restrictions in the financial systems in form of high reserve requirements, credits ceilings, low interest and any other controls distort the economy in several ways, firstly it discourage entrepreneurs to invest in high risk but potentially high yielding investments, secondly financial intermediaries may become more risk averse by offering credits to established borrowers, thirdly borrowers who obtain the funds at relatively low cost can prefer to invest only in capital intensive projects (Ang 2005, 2007).

Mackinnon –Shaw (1973) argument came in favor of liberalizing financial system through removing controls on interest and let market determine credit allocation for deepening financial sector. According to them government restrictions hinders financial development, this in turn may affect quantity and quality of investments and retard development in the financial sector. According to them, better functioning of financial system lead to robust economic growth. However some studies such as Villanueva, and Mirakhor (1990) as in Ansari (2005), have tested the relevancy of the hypothesis and find that interest deregulation may produce quite opposite results than those proposed by Mackinnon and Shaw (1973).

That in absence of macroeconomic stability and in situation where market imperfections are rampant interest rate deregulation may produce opposite results than those proposed by Mackinnon and Shaw (1973). For example in Latin America interest rate was high and still financial sector was undermined. In general economists appreciate that; interest rate deregulation has both positive and negative consequences. More empirical evidences on this view began in 1990 and especially following to the good work of King and Levine (1993) which found finance lead economic growth (Ang 2005, Hussain 2012),

On the other hand, it is also true that financial development can be caused by economic growth. That, as economic activities expands in particular area create demand for certain financial contracts and arrangements (financial services), in response to the increasing demand of financial services, financial system will be developed to facilitate provision of financial services. Pioneer of this school of thought being Robison (1956) and among recently empirical work is that of

Demetriades and Hussein (1996), which have confirmed finance follows economic growth. In particular, it is important to investigate causality with greater care because both variables financial development and economic growth can be driven by variables such as savings, investments, trade, etc. (Ang 2005). According to Rajan and Zingales (1998), savings might affect the current level of financial development and future economic growth. Higher propensity to save can lead to expansion of financial system in the economy through accumulation of savings. On the bases of the above views, present study uses savings and domestic investments as conditional variables in examining the causal relationships between financial development and economic growth in Tanzania.

4.3   Model Specification

Based on theoretical considerations presented above, the basic primary model describing the relationship between economic growth and financial development can be specified as

$$GDP = f(FD, Z) \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (1)$$

Where FD is financial development and GDP is real GDP per capita. To avoid specification bias as it has been reported in bivariate analysis, conditional variables (savings/GDP and investments/GDP) are included in model Z for estimation purpose. The function can also be presented in log linear econometric format as:

$$Log\ GDP_t = \alpha + \alpha1\ log\ FD_t + \alpha2 log\ savings/GDP_t + \alpha3 logI/GDP_t + \varepsilon_t \ . (2)$$

Where financial development (FD) is captured by (M2/GDP, Liquidity Liability/GDP and private credit/GDP), savings /GDP is ratio of savings to nominal GDP, and I/GDP is ratio of domestic investments to nominal GDP, α is constant

term, t is time trend and ε_t is error term. The coefficients α1, α2 α3 are expected to be significantly positive. In particular, study followed the basic endogenous growth model developed recently by Khan, M and D. Villanueva (1991) where economic growth (G) is determined by ratio of private Investment to GDP (I/GDP,), interest rate (R), financial development (M2G), and rate of export (XR) or simply G = f (I/GDP, R, M2G, XR) .Present study has included one additional conditional variable in the model termed as ratio of savings/nominal GDP and does not use interest rate and export variables in its analysis and uses domestic investment/GDP instead of private investment. Similar model has been followed by Hussein (1999) when examined financial liberalization, financial development and economic growth in Egypt

4.4   Model Variables

In examining development of financial sector in Tanzania, this study uses three financial development indicators and that is   ratio of broad money to nominal gross domestic product (M2/GDP), ratio of Liquidity Liabilities to nominal GDP (LQL/GDP) and ratio of private sector credit to nominal GDP (CREDIT PVT SECT/GDP). The broad money supply (M2) in Tanzania comprises currency in circulation, demand deposits and saving deposits (Economic survey 2009); it is then divided by county's' nominal gross national product (GDP). This ratio measures the real size of monetization of the economy. The ratio shows real size of financial sector of a country, if financial sector grow faster than real sector, this ratio will increase overtime (Eita and Joarn, 2007). (King and Levine, 1993, Levine 1997 and Odhiambo, 2011), are among studies used this variable. Besides that, in Tanzania

broad money supply (M2) is used as a policy variable by monetary authority to influence rate of inflation and economic growth. It was therefore necessary to use this variable to see whether the policy response has promoted economic growth. Liquidity liabilities (M3) comprises broad money supply (M2) plus foreign currencies (economic survey, 2009), it is divided by county's nominal gross national product (GDP). This ratio is the broader measure of financial depth. An increase in this ratio translates broader financial sector deepening in a country. Christina Falle (2013) used M3/GDP and according to him, many studies in Tanzania have used M2/GDP as measure of financial development rather than M3/GDP.

This study adopted both variables, that is M2 and M3, to capture their influence on economic growth. Ratio of credits extend to private sector to nominal GDP, measures the ability of financial sector to allocate credits to the private sector and is linked with investment which greatly influence economic growth than other variables.

Akinbodae (1998) credits provided to private sector increases productivity than credit extended to public sector (see, Edita and Jordaan 2007). This ratio is expected to increase over time, if financial sector grows faster than real sectors of the economy and decrease if financial sector grows slowly than real sectors of the economy.

Economic growth is captured by real GDP percapita. An increase in real GDP percapita overtime is interpreted as improvements of living standards of citizens in a particular country. Odhiambo (2011) adopted real GDP percapita in his study in

Tanzania. Gross domestic investments consist of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Growth of this variable, it implies that capital formation is growing suggesting there is allocation of capital or resources to produce goods and services within an economy. Gross national savings is derived by deducting Consumption from Gross National Product. Ang (2007) among others variables he used to explore mechanisms linking financial sector and Economic growth in Malaysia was investments and savings.

4.5   Data Sources

The direction of causality investigated using time series annual data set. Series of the variables used M2/GDP, Liquidity Liabilities/GDP and credit to private sector/GDP were collected from International financial statistics (IFS) of IMF, while savings / GDP, and investments / GDP, real GDP percapita and real GDP growth rates were gathered from World Bank, World economic indicators (WEO) on their websites database. These data are published yearly and are accessible freely from the respective websites databases, the sample period cover between 1980 -2012. To our knowledge 33 observations are long enough to allow meaningful analysis to be undertaken.

4.6   Econometrics Procedures for Data Analysis

Data analysis was based on Eviews software involving five series of steps, first tested for a normal distribution of the variables using descriptive statistics, then tested for stationary using Augmented Dickey and Fuller (ADF) statistic test, further tested for cointergration using Johansen test, also tested for short run and long run

causality using Vector error correction model (VECM) and finally used Granger causality test through Vector Autoregressive methods to establish the direction of causality.

4.6.1   Descriptive Statistics

To summarize properties of variables under investigation study adopted descriptive statistics. In particular our interest was to examine whether series of each respective variable follow a normal distribution. According to Central limit theory, "many distributions can be approximated by normal distributions if the sample size is large enough" (Heij et al., 2004), thus it was necessary to examine properties of the variables before proceeding with the next step. In descriptive statistics study used mean, median, maximum, minimum, standard deviation, Jarque -Bera, skewness and kurtosis to investigate properties of each respective series of a variable. Detail of each statistics techniques is presented from below paragraph.

Mean is the average value of the series, obtained by adding up the series and dividing by number of observations. This is the simplest measure of location of a distribution. Mathematically is expressed as $\bar{Y} = \frac{\sum_{i=1}^{N} Y_i}{N}$ where N is sample size and $\sum$ is a summation operator.   Median is the middle value of the series when values are ordered from the smallest to the largest. The median is the robust measure of the centre of the distribution that is less sensitive to outliers than the mean. Maximum is the highest value of the series while Minimum is the lowest value of the series. Standard deviation Standard deviation is the measure of dispersion or spread in the series. Standard deviation is given by the following formula, $S = \frac{\sqrt{\sum_{i=1}^{N}(Y-\bar{Y})^2}}{N-1}$

where, N is number of observations in the current sample, $\bar{Y}$ mean of the observations (Heij et al 2004, EViews 9, 2015). Further, according to, (EViews 9, 2015), skewness is the measure of symmetry of the distribution of the series around the mean. Skewness is computed as $s = \dfrac{\frac{1}{N}\sum_{i=1}^{N}(Y-\bar{Y})^3}{\hat{\sigma}}$ where is an estimator of standard deviation that is based on the biased estimation for the variance $\hat{\sigma} = S\sqrt{N-1}/N$. The skewness of symmetric distribution such as the normal distribution is zero. Positive skewness means that the distribution has a long right tail and negative skewness implies that the distribution has a long left tail.

Also, another measure of distribution is Kurtosis, which measures the peakness or flatness of the distribution of the series. The kurtosis is computed as, $K = \dfrac{1}{N}\sum_{i=1}^{N}(Y-\bar{Y})^4/\hat{\sigma}$, where $\hat{\sigma}$ is based on biased estimator for the variance. The kurtosis of a normal distribution is 3. If kurtosis exceeds 3, then the kurtosis is peaked (Leptokurtic) relative to normal and likewise if the kurtosis is less than 3, the distribution is flat (platykurttic) relative to normal.

Lastly, Jarque- Bera test statistics. This test statistics is used to test whether the series of a variable is normally distributed. The test statistics measures the difference of the skewness and kurtosis of the series with those from normal distribution. The statistics is computed as; $\text{Jarque} - \text{Bera} = \dfrac{N}{6}\left(S^2 + \dfrac{(K-3)^2}{4}\right)$ where, S is skewness and K is kurtosis. Null hypothesis tested using Jarque-Bera for each variable is that series of a variable follow a normal distribution versus series of a variable does not follow a normal distribution. Jarque- Bera statistics has probability value which is

observed either to reject or not to reject the null hypothesis at the respective significance levels. However, rejection of the null hypothesis implied that respective series of a variable does not follow a normal distribution .The descriptive statistics was performed by using descriptive statics function as supported by EViews software.

4.6.2   Stationarity Test

Gujarati (2003), time series data is said to be stationary if mean and variance are constant through time and covariance between two time periods depends only by distance or time lag between the two time periods and not actual time at which covariance is computed. Time series data by its nature are non stationary and running regressions using non stationary data result to spurious regression results or nonsense regression results, that the t- ratio, R-square and adjusted- R become overestimated in magnitude and the whole results become meaningless. Thus, to avoid spurious regression results on non-stationary variables all series of variables are differenced to obtain stationary series. There are different econometrics techniques used to test stationarity and among others it includes, correlogram and unit root test.

This study adopted unit root test because is the most widely used one in empirical literature. In particular study uses standard Augmented Dickey-Fuller (ADF) test, which takes into account any autocorrelation presented by adding the lagged values of the dependent variable ΔX_t

$$\Delta X_t = \alpha_1 + \alpha_2\, t + \delta X_{t-1} + \sum_{t=1}^{m} \beta_t \Delta X_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Analysis first involved intercept and trend (α_2 t) only then, intercept (α_1) only. Where X_t is the variable, whose time series properties is being investigated, Δ is the Difference operator, m is the number of lagged variables, and where ε_t is the random error term. Null hypothesis tested is that ($\delta = 0$), that is, there is a unit root and the time series is non stationary and alternative hypothesis tested ($\delta < 0$), that is, the time series is stationary. If null hypothesis rejected, it means X_t is a stationary time series with zero mean and likewise if null hypothesis is not rejected implies that, X_t is non stationary.

However, decision to reject or not to reject the null hypothesis depend on the coefficient of X_t t- statistics of and it's critical values obtained by running regression equation number (3) above. If computed t- statistics is grater that critical values of t-statistics in absolute terms, we reject the null hypothesis that $\delta = 0$, which is the case X_t time series is stationary. Conversely, we did not reject the null hypothesis in the case where t- statistics was less than its critical values in absolute values and conclusion was that, X_t time series was non-stationary.

4.6.3   Cointergration Test

Cointegration is a long run equilibrium relationship of variables which are linked together to form an equilibrium relationship when the individual series themselves are non-stationary in their levels, but become stationary when differenced (Sindano 2009, Mbellenge and Aikael 2010). Good time series modeling normally is required to define both short run and long run dynamic movements simultaneously. There are

generally two widely used approaches to investigate cointergration between variables, Engle Granger and Johansen tests. Engle-Granger approach investigates the possibility of cointergration between variables in a bi-variate framework. One of its major weaknesses or limitation is that, it assumes existence of uniqueness of a cointergrating vector and when there are more than two variables does not provide sufficient framework. Johansen test investigate cointergration in a multivariate framework and one of its main advantage is that, it can specify more than one cointergrating vector or equations. Further, this technique is more useful in analysis, which involves more than two variables contrary to Engle- Granger approach. This means, with Johansen test more than one long run equilibrium relationships governing the joint evolution of variables can be specified.

With consideration of limitations derived from using Engle- Granger approach and in view of using six variables in our analysis, this study applies Johansen procedure, which is based on Vector Autoregression (VAR) framework. This econometric technique corrects for autocorrelation and endogeneity parametrically using vector error correction (VECM) mechanism specification (Edita and Jordaan 2007). The Johansen procedure in form of Vector Autoregressive Error correction mechanism for k vector and variable X_i is described as follows.

$$\Delta \chi_t = \sum_{i=1}^{p-1} \prod_i \Delta \chi_{t-i} + \alpha \beta \chi_{t-p} + \epsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

Where vector β (-1, $\beta 2$, $\beta 3 \ldots \beta n$) Contain r co integrating vectors and speed of adjustments parameter α ($\alpha 1$, $\alpha 2 \ldots \alpha n$) when rank $\beta = r < k$, k is number of

endogenous variables (Amiruddin et al, 2007). The r stands for number of cointergrating relations (The Cointergrating rank).

Johansen cointergration test has two tests that is trace statistics and maximum eigenvalue test. The trace statistics test, test the null hypothesis of r cointergrating relations against the alternative of k cointergrating relations, where k is the number of endogenous variables for r = 0, 1…k-1. The trace statistics test for null hypothesis for r cointergrating relations is computed as, $LR_{tr}(r/k) = -T \sum_{i=r+1}^{k} \log(1 - \lambda_i)$ where, λ_i is the i –th largest eigenvalue of the Π matrix. The maximum eigenvalue statistics test the null hypothesis for r cointergrating relations against alternative of r+1 cointergrating relations. This test is computed as, $LR_{max}(r/r + 1) = -T \log(1 - \lambda_{i+1})$. Johansen test in EViews can specify number of cointergrating relations and expresses different normalization for each possible number of cointergrating relations (EViews 9, 2015).

4.6.4 Granger Causality Test

In order to test whether financial development causes economic growth and vice versa study uses granger causality test developed by Granger (1969), according to him a variable (in case Financial Development) is said to granger causes the other variable (Economic Growth) if the past and present financial development can predict Economic growth/real GDP percapita (Edita, and Jordan 2007).

This approach is preferred because of its response for both small and larger samples (Odhiambo 2011). Thus; for estimation purpose a simple causality test is presented by the following regressions equations assuming three variables case.

$$FD_t = \sum_{j=1}^{p} \alpha_j FD_{t-j} + \sum_{j=1}^{p} \beta_j GDP_{t-j} + \sum_{j=1}^{p} \gamma_j Z_{t-j} + \mu_{1t} \dots \dots \dots \dots \dots \dots \dots \dots (5)$$

$$GDP_t = \sum_{j=1}^{p} \lambda_j FD_{t-j} + \sum_{j=1}^{p} \delta_j GDP_{t-j} + \sum_{j=1}^{p} \phi_j Z_{t-j} + \mu_{2t} \dots \dots \dots \dots \dots \dots \dots \dots (6)$$

$$Z_t = \sum_{j=1}^{p} \theta_j FD_{t-j} + \sum_{j=1}^{p} \eta_j GDP_{t-j} + \sum_{j=1}^{p} \omega_j Z_{t-j} + \mu_{3t} \dots \dots \dots \dots \dots \dots \dots \dots (7)$$

Where ere μ_{1t}, μ_{2t}, and μ_{3t} white noisy error term for the three functions, GDP_t = Economic growth variable (in real GDP percapita) and FD_t = Financial development (Measured by the ratio of private credit extended to nominal GDP: the ratio of broad money (M2) to nominal GDP and liquidity liabilities to nominal GDP, Z_t = Savings to GDP and domestic investments to GDP .Similar approach has also been followed in (Chimobi ,2010, Ang 2005).

From the equations above:

$H:_{\lambda_j} = 0$, $j = 1 \dots \dots \dots P$, This hypothesis means financial development does not cause economic growth

$H:_{\beta_j} = 0$, $j = 1 \dots \dots \dots P$,*This hypothesis means economic growth does not cause financial development*

H; ϕ_j=0,   j =1 …P, Savings and domestic investments does not causes economic growth

H; θ_j =0,   j=1 ….P, This means financial development does not cause savings and domestic investment.

If first hypothesis is rejected means causality runs from financial development to economic growth and rejection of second hypothesis means causality runs from economic growth to financial development. Rejection of third hypothesis means causality run from savings and domestic investment to economic growth and likewise rejection of fourth hypothesis means causality run from financial development to savings and domestic investments'. If none hypothesis rejected, means financial development does not cause economic growth and economic growth does not cause financial development and likewise savings and investments' does not cause financial development and economic growth and vice versa.

However, the traditional granger causality test as presented above uses F-statistics. The use of F-statistics have some statistical problems and has been identified as not sufficient if variables are integrated at order I(1) and cointegrated, that it fails provides standard distribution (Edita et al, 2007). It is therefore advised to obtain the causal inference through error correction model because it reintroduces information again that lost during differencing process and hence maintaining long run information. Error correction model is presented by equations (8, 9 and 10).

$$\Delta FD_t = \sum_{j=1}^{p} \alpha_j \, \Delta FD_{t-j} + \sum_{j=1}^{p} \beta_j \, \Delta GDP_{t-j} + \sum_{j=1}^{p} \gamma_j \, \Delta Z_{t-j} + \rho_1 EC_{1t-1} + \mu_{1t} \dots\dots\dots\dots\dots\dots (8)$$

$$\Delta GDP_t = \sum_{j=1}^{p} \lambda_j \Delta FD_{t-j} + \sum_{j=1}^{p} \delta_j \Delta GDP_{t-j} + \sum_{j=1}^{p} \phi_j \Delta Z_{t-j} + \rho_2 EC_{1t-2} + \mu_{2t} \dots \dots \dots \dots \dots \dots (9)$$

$$\Delta Z_t = \sum_{j=1}^{p} \theta_j \Delta FD_{t-j} + \sum_{j=1}^{p} \eta_j \Delta GDP_{t-j} + \sum_{j=1}^{p} \omega_j \Delta Z_{t-j} + \rho_3 EC_{1t-3} + \mu_{3t} \dots \dots \dots \dots \dots \dots (10)$$

Where Δ difference operator, and causal inference is captured by ρ_1, ρ_2 and ρ_3 coefficients of the error correction terms *(EC)* derived from cointergration equations below (Equation 11 to 13). Sign for the coefficients of error correction terms are expected to be negative and statistically significant. This implies existence of long run causality from independent variables to dependent variable.

$$FD_t = \delta + \varphi Y_t + \pi Z_t + EC_{1t} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (11)$$

$$GDP_t = \alpha + \psi FD_t + v Z_t + EC_{2t} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (12)$$

$$Z_t = \chi + \varrho FD_t + \varpi Z_t + EC_{3t} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (13)$$

In particular, the Error correction model (ECM) used to answer objective two, which was to examine effectiveness of financial sector in promoting economic growth in Tanzania. In this study effectiveness of financial sector in promoting economic growth was examined by looking whether financial sector exert short run or long run influence in economic growth through the coefficient of error correction term (ECT). Error correction equation 9 presented above with dependent variable real GDP percapita was adopted for such analysis. The sign for the coefficient of error correction term (ECT) for long run causality was required be negative and statistically significant, and for short run causality, positive sign and statistically significant or some individual/ independent variables were required be significant. If short run influence was confirmed from financial sector to economic growth,

conclusion was that financial sector has been effective in a short run. Similarly for the case of long run influence from financial sector to economic growth, conclusion drawn was that financial sector has been effective in promoting economic growth in a long run.

Further, the same procedures applied to answer objective three, (to examine mechanisms linking financial sector and economic growth) but in this case analysis focused on error correction equation 10 as indicated above. To detect long run linkages between financial development and economic growth the coefficient of error correction term (ECT) for error correction equation with savings to GDP (S/GDP) and gross domestic investments to GDP (I/GDP) was required to be negative and statistically significant. In case of positive sign and statistically significant coefficients of error correction term, it implied short run linkages between financial sector and economic growth. Likewise if the coefficient of error correction term was neither negative nor statistically significant but some individual /independent variables were significant, it implied short run linkages. Finally a pairwise granger causality test based n VAR framework was employed to establish the direction of causality. The final regression equations used in the analysis were those presented above (8 to 10).

4.6.5 Variance Decomposition (VD)

Unfortunately F and t – test in the Vector error correction model describe causality within the sample period only. They only determine degree of exogenoeity or endogeneity of dependent variables within the estimated period. Outside the

sampling period, they do not indicate the degree of exogeneity between variables. Variance decomposition can describe causality outside the estimated period. Thus, we can validate strengths of our findings about causality beyond the estimated sample period. Variance decomposition decomposes variation in endogenous variable into components of shocks to endogenous variables in the VAR.

Variance decomposition (VD) shows the percentage of forecast error variance of each variable that may be attributed to its own shocks and to fluctuations in other variables in the system and is based on moving average model (MA) obtained from original VAR model. In EViews the choleski's clarification method is utilized to orthogoralize all innovations. The method is very sensitive to and depends on order of variables. In the present study order is identified according to importance of variable (GDP, FD, I, S). (Abu-bader et al, 2005 and 2006) are among of recently studies used variance decomposition to validate strength of granger causality outside the estimated period.

4.7   Summary

In this chapter I have discussed, theoretical underpinnings about financial development and economic growth, empirical model specification, and hypothesis tested all the time one variable does not granger causes the other variables involving M2/GDP, Liquidity liability to GDP and credit provided to private sector to GDP and real GDP percapita, savings to GDP and domestic investments to GDP. Finally data analysis techniques conducted by using Eview software through series of steps starting with stationary test, cointergration test and finally causality test on the

variables using granger causality test through cointergrated VAR methods and at the end presented variance decomposition (VDC) to be used for validating strengths of our findings beyond the sampling period.

CHAPTER FIVE

RESULTS AND DISCUSSION

5.1   Introduction

This chapter presents study results and discussion into six major sections. It begin with descriptive statistics in section one which test for normal distribution of variables then, present stationary test results in section two, it followed with Cointergration test results in section three, Vector Error Correction Models (VECMs) results in section four, then Granger causality test results in section five and finally Variance Decomposition results in section six before summary.

5.2 Descriptive Statistics

Table 5.1: Summary of the Descriptive Statistics of the Variables

	LN Real GDP percapita	LNM2/ GDP	LN LIQUIDITY L/GDP	LNCREDIT PVT SECT/ GDP	LN INVESTIMENT/ GDP	LN SAVINGS/ GDP
Mean	241632.3	0.220859	0.272256	0.081227	0.229577	0.157988
Median	406052.2	0.194775	0.247837	0.068347	0.216000	0.16014
Maximum	215234.6	0.424319	0.425081	0.178581	0.394012	0.24143
Minimum	55565.6	0.110317	0.178268	0.015835	0.148997	0.04462
Std.Dev	55565.6	0.092505	0.077438	0.055403	0.061022	0.058101
Skewness	1.206903	1.133168	0.588936	0.359077	0.866964	0.321433
Kurtosis	3.078481	2.968758	2.086385	1.652188	3.216745	2.07443
Jarque-Bera	8.019853	7.063721	3.055356	3.206971	4.198537	1.746189
Probability	0.018135	0.02925	0.217039	0.201194	0.122546	0.417657
Sum	8833820	7.288334	8.98445	2.680477	7.576029	5.2136
Sumsq.Dev	E+109.88	0.273828	0.191891	0.098224	0.119159	0.108023
Obsevations	33	33	33	33	33	33

Source: Author, LN is log, significance level 5%

Most of the study variables were normally distributed after being transformed into logarithm since; Jarque-Bera probability was not significant in most of the variables. This implied that series of the respective variables followed a normal distribution. Also, skewness was almost close to zero in most of the variables implying distribution was symmetrical around mean. With respect to peakeness of variables, most of them were flat than a normal distribution with kurtosis less than 3. Further, findings show that there is degree of variability in most of the variables under investigation as indicated by standard deviation (Table 5.1).

5.2 Stationary Test Results

Time series data for the respective variables were tested for non-stationary using Augmented Dickey full test (ADF) by first testing variables at their level before causality test. The reason behind of carrying this test was to identify the order of integration, which is the initial condition, which should be satisfied before proceeding with further procedures. The test involved first running the model with constant and trend (deterministic trend), it followed with constant only for each respective variable under investigation. Null hypothesis tested, series of a variable has unit root and is non-stationary (Ho: has unit root and is non stationary) and alternative hypothesis series of a variable has no unit root and trend stationary (H1: has no unit root and trend stationary).

However, Augmented Dickey Fuller test when computed provided t- statistics and critical values with either negative sign or positive sign. These values under t-statistics and critical values were assumed to be in absolute terms and the negative sign was not taken into consideration during analysis. Decision to reject the null hypothesis in each case reached only where computed t-statistics was greater than the critical value of 5%. If such condition was not meet, alternative hypothesis in each case was rejected in favour of null hypothesis, implying that series of a variable under investigation had unit root and was non-stationary. In econometrics analysis, if series of a variable and especially for time series annual data set has unit root is either integrated in order one I (1) or order two I (2). For the first time, this study assumed order of integration is one I (1) for all variables because most of the time series data become stationary after taking first difference.

The test results indicates that real GDP per capita series when defined in its level as in Table 5.2 the Computed t-statistics values for real GDP percapita in each model case (constant & trend, and constant only) was less than critical value of 5%. In this case the null hypothesis that series of real GDP percapita has unit root and is non-stationary was not rejected in each model case. In other words, the alternative hypothesis that series of real GDP percapita has no unit root and trend stationary was rejected and conclusion was that, the series of real GDP percapita had a unit root and was non-stationary. Also, computed t-statistics values for M2/GDP were less than critical values of 5% in all model cases. Null hypothesis was not rejected and conclusion was that series of the variable (M2/GDP) contain a unit root and is non-stationary.

Further, Liquidity Liabilities to GDP at critical values of 5% for all model cases were higher than t-statistics values in absolute terms. Null hypothesis failed to reject meaning that, the series of Liquidity Liabilities to GDP has unit root and is non-stationary. Also, computed test statistics values for credit to private sector to GDP series were less than at the critical values 5% in absolute terms, hence null hypothesis fail to reject in each model case, implying that series has a unit root and was non stationary. Likewise, computed test statistics values for Savings to GDP and domestic investments to GDP were less than critical values of 5% in each model case. In each model case null hypothesis was not rejected and concluded that each respective series of a variable (Savings /GDP & domestic investment /GDP) had unit root and was non-stationary.

Table 5.2: Stationary Test Results at Levels

Name of variable	Model specification	t-statitsics	Critical values of 5%	Stationary status
LN Real GDP percapita	Constant and trend	-0.339605	-3.562882	I (2)
	Constant	1.202157	-2.960411	I (2)
LNM2/GDP	Constant and trend	-1.751225	-3.562882	I (1)
	Constant	-2.176398	-2.960411	I (1)
LN LIQUIDITY L/GDP	Constant and trend	1.753779	-3.562882	I (1)
	Constant	-2.205158	-2.960411	I (1)
LNCREDIT PVT SECT/GDP	Constant and trend	-1.96857	-3.557759	I (1)
		-0.87569	-2.960411	I (1)
LN SAVINGS/GDP	Constant and trend	-2.399366	-3.557759	I (1)
	Constant	-2.172645	-2.95711	I (1)
LN INVESTIMENT/GDP	Constant and trend	-1.136509	-3.557759	I (1)
	Constant	-0.319325	-2.95711	I (1)

Source: Own Author. In each case t- statistics values in absolute terms were less than critical values of 5%. Null hypothesis in each model case was not rejected implying all series of variables were non-stationary. LN = Log

After testing variables at their levels, the next step was differencing once all variables to turn data into stationary. Null hypothesis tested all the time, series of a variable has unit root (H0: has unit root) and alternative hypothesis series of a variable has no unit root and trend stationary (H1: has no unit root and trend stationary). Rejection of null hypothesis means series of a variable has no unit root and trend stationary. It appeared that after taking first difference the null hypothesis rejected in each model case for M2/GDP, Liquidity Liability to GDP and Private credit/GDP, Savings /GDP and Domestic investments/GDP.This implied that variables were stationary and were integrated at order zero I (0) in all model cases since, at significance level of 5% the t statistics values were higher than critical

values in absolute terms. However, for real GDP per capita the null hypothesis was not rejected which means the series were integrated at order I (2) and become stationary at their second difference. Table 5.3 presented demonstrates stationary status of the series after differencing.

Table 5.3: Stationary Test Results after Taking First and Second Difference

Name of variable	Model specification	t-statitsics	Critical values of 5%	Stationary status
LN Real GDP percapita	Constant and trend	-6.305895	-3.568379	I(0)
	Constant	-6.423640	-2.963972	I(0)
LNM2/GDP	Constant and trend	-5.165839	-3.562882	I(0)
	Constant	-4.585633	-2.960411	I(0)
LN LIQUIDITY L/GDP	Constant and trend	-5.230623	-3.562882	I(0)
	Constant	-4.598399	-2.960411	I(0)
LNCREDIT PVT SECT/GDP	Constant and trend	- 4.99955	-3.562882	I(0)
	Constant	-5.04393	-2.960411	I(0)
LN SAVINGS/GDP	Constant and trend	-5.757662	-3.562882	I(0)
	Constant	-5.808629	-2.960411	I(0)
LN INVESTIMENT/GDP	Constant and trend	-5.136477	-3.562882	I(0)
	Constant	-4.888565	-2.960411	I(0)

Source: Author. In all cases t- statistics values in absolute terms were greater than critical values of 5%. Null hypothesis in each case was rejected implying that all series of variables were stationary.LN = Log.

The results in Table 5.3 justify that, all series of the variables were integrated in the some order, that is order zero I (0) after taking first difference for M2/GDP, LQL/GDP, and CREDIT PVT SCT/GDP, I/GDP and S/GDP and second difference for real GDP percapita.

5.3   Cointegration Test Results

Having verified that the series of the data and M2/GDP, Liquidity liability to GDP and credit pvt sect/GDP, savings/GDP and domestic investments/GDP are integrated

in order one I(1) and real GDP percapita I(2) in their levels, and after taking first difference for M2/GDP, Liquidity liability to GDP, credit pvt sect/GDP, savings/GDP and domestic investment/GDP and second difference for the real GDP percapita, all variables were stationary and integrated at order zero I(0). The next step was to perform cointegration test using Johansen procedures based on multivariate to determine whether there is stable long run relationships between financial development and economic growth in Tanzania.

When computed Johansen test provided trace statistics and maximum eigenvalue statistics, critical values and p-value results. Trace statistics confirmed existence of two cointergration relationships between the two variables. That, the null hypothesis rejected r = 0, r ≤1 for trace statistics, since computed trace test value was higher than critical value and p-value was less than 5 percent in other words I accepted alternative hypothesis at r = 1, and r = 2 which implied existence of two long run cointegration relationships The second part of the test provided maximum eigenvalue statistics, this indicated existence of two co integration relationships between the two variables. The null hypothesis r = 0, r ≤1 rejected on maximum eigenvalue statistics at level of 5 percent and I accepted alternative hypothesis r ≥1 and r ≥ 2 which means two co integrating equation found between economic growth and financial development as indicated on the Table 5.3. The results in general indicates that over long-run financial development and economic growth tend to move together towards to the equilibrium or steady state and any deviations from the equilibrium because of shocks the system will have tendency to correct and restored back. The optimal lag length selection was based on Akaike and Hannan –Quinn information selection

criterion. Lag 1 was chosen for the cointergration test model. Before running the cointergration test, it was necessary to establish deterministic trend assumption of the test, in this case we assumed linear deterministic trend in the data with intercept (no trend) in cointergration equation and test VAR as in EViews 9 (2015). The results of Johansen cointergration tests are as presented by Table 5.4.

Table 5.4: Johansen Cointergration Test Results

Trace test						Maximum eigenvalue test				
H0:	H1:	Eigen value	trace statics	critical value(0.05)	$p-$ value (**)	H1:	Eigen value	maximum eigen statistics	critical value	$p-$ value (**)
r*=0	r=1	0.823545	130.5979	95.75366	0.0000	r≥1	0.823545	53.7753	40.07757	0.0008
r*≤1	r=2	0.673971	76.82259	69.81889	0.0124	r≥2	0.673971	34.7439	33.87687	0.0393
r≤2	r=3	0.474075	42.07874	47.85613	0.1565	r≥3	0.474075	19.9205	27.58434	0.3467
r≤3	r=4	0.30237	22.15825	29.79707	0.2898	r≥4	0.30237	11.1621	21.13162	0.6311
r≤4	r=5	0.218899	10.99621	15.49471	0.2117	r≥5	0.218899	7.65856	14.2646	0.4145
r≤5	r=6	0.102072	3.337641	3.841466	0.0677	r≥6	0.102072	3.33764	3.841466	0.0677

Both Trace test and maximum eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

H0;present Null hypothesis , and H1: Alternative

$$RGDPP = -1197790 \cdot M2/GDP + 1153819 \cdot LQL/GDP + 66404 \cdot CR/GDP + 475420 \cdot I/GDP - 125365 \cdot S/GDP..(1)$$

$$RGDPP = 157303 \cdot LQL/GDP + 317945.8 \cdot CR/GDP + 566513.7 \cdot I/GDP - 411170.4 \cdot S/GDP ... .. (2)$$

Equations (1 and 2) present Long run equilibrium relationships estimated through Johansen test. Normalization is on real GDP percapita ($RGDPP$). Similar presentation has been done by Asteriou and Stephen (2007). For more details about the Johansen equations see attached Appendix 1.

5.4   Vector Error Correction Model (VECM)

After being satisfied with the results from Johansen test that, there is evidence supporting existence of more than one long run equilibrium relationship between financial development and economic growth, I went further to examine whether the causality is in a short run or long run through vector error correction model (VECM). This model (VECM) is only adopted when evidence of long run equilibrium relationship between variables has been confirmed. When no long run association between variables has been detected unrestricted Vector autoregressive (VAR) is adopted which normally tend to suggest existence of short run causality only (See, Asteriou and Stephen 2007).

For VECM Model the maximum numbers of lag lengths chosen were 2 lags based optimal lag length selection criteria. To get meaningful analysis on the long run causality only one cointergration equation was included in the VECM instead of two. EViews through VEC function one can specify number of cointergrating equations confirmed which normally appears in the VECM. In the present case only cointergration was specified.

Table 5.5: Summary Results of Vector Error Correction Models with Diagnostic Tests

	ΔLNReal GDP percapita	ΔLNM2/ GDP	ΔLNLQL/ GDP	ΔLNCREDIT PV/GDP	ΔLNI/GDP	ΔLNS/GDP
Constant	1592.40 (1.48)	0.017 (-1.62)	-0.012 (-1.12)	-3.84 (0.00)	-0.004 (0.79)	-0.013 (-1.13)
ECT	-0.0046 (-0.54) {0.58}	8.22 (0.97) {0.33}	5.15 (0.60) { 0.54}	-1.18* (-3.58) {0.00}	1.67* (4.47) {0.00}	5.5 (0.56) {0.57}
R-Square	0.85	0.27	0.27	0.83	0.86	0.52
DWS	2.10	2.10	2.28	2.10	1.88	2.02
x^2- normality (Prob JarqueBera)	0.61	0.00	0.00	0.72	0.91	0.40

x^2- Het test (ProbF-statitics)	0.81	0.10	0.12	0.12	0.99	0.08
x^2- Arch test (ProbF-statitics)	0.73	0.69	0.82	0.43	0.18	0.85

t-statistics ( ), p-value {   }, * Significance level of 1% rejected null hypothesis. LN is Log, Durbin Watson statistics (DWS), ECT is error correction term,

Source: Author

After estimating VECMs I conducted diagnostic tests and it followed with deep analysis of VECMs. In diagnostic tests, it involved first testing whether models estimated were spurious or not. This detected by using the rule of thumb as proposed by Granger and Newbold (1974), that if R- square is greater than Durbin Watson statistics (DWS), or R-square $\approx$ 1 then, model estimated was spurious and conversely, if R-square was less than Durbin Watson statistics (DWS) then estimated model was not spurious (Asteriou and Stephen, 2007).

It is worth noting that in each error correction equation Durbin Watson statistics was greater than R-square and conclusion was that models estimated were not spurious. Since Durbin Watson statistics is larger than R-square in each model, according to Marno Verbeeck, (2004), there is no serial correlation on the residuals. Normality test as reported in Table 5.5 suggest that most of the estimated models residual follow normal distribution except in model with LQL/GDP and M2/GDP where, the null hypothesis that the residual follow normal distribution was rejected at significance level of 5%, meaning that the residual does not follow normal distribution for the two respective models. Also, in all estimated models there were no problem of heteroskedasticity (Het) and autoregressive conditional (ARC) since null hypothesis in each case was not rejected at significance level of 5%. Although,

there was weakness on error correction equation with LQL/GDP and M2/GDP, still we went on with further estimations and analysis because in other residual tests the null hypothesis in each case was not rejected at significance level of 5% (see Asteriou and Stephen, 2007).

From the VECMs summary report represented in Table 5.5, the first error correction term (ECT) with dependent variable real GDP percapita indicates that there is no evidence of long run causality from M2/GDP, liquidity liabilities/GDP, credit pvt sect/GDP, savings/GDP and domestic investment/GDP to real GDP percapita. To have long run causality the coefficient of lagged variable (error correction term or ECT) the sign must be negative and statistically significant but for this case the coefficient of error correction term (-0.0046) was negative as expected but not statistically significant. The results suggest absence of long run causality from independent variables (Financial variables) to real GDP percapita. In other words, there is no evidence supporting existence of long run causality from financial variables to economic growth.

Likewise, coefficients of error correction term (ECT) in equation with dependent variable M2/GDP, LQL/GDP and S/GDP respectively, the sign of the error correction term was neither negative nor statistically significant. This implied that there is no long run causality running from independent variables (Economic growth) to the respective dependent variable M2/GDP, LQL/GDP and S/GDP.

However, in error correction term (ECT) with dependent variable credit to private sector /GDP, the coefficient of error correction term had negative sign (-1.18) as

expected and was statistically significant at 1 percent. The results suggests existence of one long run causality running from independent variables (Economic growth) to credit to private sector /GDP, meaning that economic growth causes financial development in a long run.

Also, coefficient of error correction term (1.67) in model five with gross domestic investments/GDP as dependent variable was not negative as expected but was statistically significant at 1 percent. The results suggest that there is no evidence of long run causality running from independent variables to gross domestic investment to GDP.In other words, results suggest existence of short run causality running from independent variables (financial development and economic growth) to gross domestic investment to GDP. This implies that capital accumulation channel through gross domestic investments/GDP link financial development and economic growth in a short run only.

In general the VECMs summary results suggest that, there is only one long-run causality running from independent variables (real GDP percapita) to credit to private sector /GDP. Also, there is short run causality from independent variables (financial development and economic growth) to gross domestic investment to GDP. Furthermore, short run causality was also detected by looking significances of each individual independent variable in each error correction equation. After looking individual variable in each equation it appeared that, in a short run gross domestic investments'/GDP causes economic growth and economic growth causes gross domestic investments to GDP, real GDP percapita causes M2/GDP, and LQL/GDP

since their respective p-values were statistically significant. Also, M2/GDP, LQL/GDP, and Credit to pvt sector/GDP individually seen to cause gross domestic investments in a short run while, S/GDP causes only M2/GDP. More detail about the significance of individual independent variables in each error correction equation has been presented on the attached Appendix 5.

One of the study targets to run VECMs was to answer objective two, which was to examine effectiveness of financial sector in promoting economic growth in Tanzania. So far there is clear evidence from the VECM that financial sector in a long run has not promoted economic growth in Tanzania. In other words, our results suggest that financial sector has been effective in promoting economic growth in a short run. The justification is found from the error correction equation with real GDP percapita; where the coefficient of error correction term (ECT-1) -0.0046 was negative as expected but not statistically significant. This implied that there is no long run causality running from financial variables to economic growth.

Further, when examines whether causality from financial sector to economic growth was in a short run by observing influence of financial variables individually on economic growth through Vector Error Correction Model (VECM), it appeared that none of the financial variable was seem to cause economic growth and yet model estimated was well fitted. Thus, it was necessary to test for joint short run influence from financial indicators/variables to economic growth (real GDP percapita).

In regression analysis if model is fitted well and variables (independent variables) individually does not seem to be statistically significant in explaining dependent variable; it implies that the independent variables have joint influences on the dependent variable. In this case it was necessary to test joint short run influence by imposing restrictions on the coefficients of independent variables from the error correction equation equals to zero using Wald test (coefficient restrictions). Null hypothesis tested all the time was that, there is no joint influence running from each independent variable to economic growth. In particular study targeted model or error correction equation for testing joint short run causality was that with dependent variable real GDP percapita because is the one which can explain clearly the influences from financial sector to economic growth.

Table 5.5 shows joint short run causality results examined using Wald test. In this table the coefficients of credit to private sector/GDP when tested under the null hypothesis that c (8) =0, c (9) =0, the results confirmed coefficients of credit to private sector/GDP jointly causes economic growth in a short run since, probability of F-statistics 0.09832 and Chi square 0.0631 which normally takes into account causality using joint influences of the coefficients were statistically significant at 10% respectively. This implied that credit to private sect/GDP causes economic growth in a short run through joint influences of its coefficients. Other variables apart from real GDP percapita had no joint influences on economic growth since in each case null hypothesis was not rejected.

5.5 Wald Test Joint Short Run Causality Results

Table 5.6: Short Run Causality Results, Real GDP Percapita Dependent Variable

Wald test			
LN real GDP percapita; Null hypothesis tested c(2)=0,c(3)=0			
Test statistics	Value	df	Probability
F –statistics	25.29337	(2,16)	0.0000
Chi square	50.58674	2	0.0000
LN M2/GDP; Null hypothesis tested c(4)=0, c(5)=0			
Test statistics	Value	df	Probability
F –statistics	0.075505	(2,16)	0.9276
Chi square	0.151010	2	0.9273
LN LQL/GDP; Null hypothesis c(6)=0, c(7)=0			
Test statistics	Value	df	Probability
F –statistics	0.317476	(2,16)	0.7325
F –statistics	0.634953	2	O.7280
CREDIT PVSCT/GDP; Null hypothesis c(8)=0, c(9)=0			
Test statistics	Value	df	Probability
F –statistics	2.762880	(2,16)	0.09832
Chi square	5.525760	2	0.0631
I/ /GDP: Null hypothesis, c(10)=0, c(11)=0			
Test statistics	Value	df	Probability
F –statistics	1.766967	(2,16)	0.2026
Chi square	3.533934	2	0.1709
S /GDP: Null hypothesis c(12)=0, c(13)=0			
Test statistics	Value	df	Probability
F –statistics	0.410246	(2,16)	0.6703
F –statistics	0.820492	2	0.6635

Restrictions are linear in coefficients; significance levels 1%, 5% and 10%. C ( ) represents coefficients of independent variables while real GDP percapita is dependent

Source: Author

Also, the third specific study objective was to explore mechanisms linking financial development and economic growth in Tanzania. The VECM summary results presented on Table 5.6 justify that capital accumulation channel through gross domestic investments to GDP link financial development and economic growth in a short run only. There is no evidence supporting capital accumulation channel through gross domestic investments to GDP (I/GDP) link financial development and

economic growth in a long run. The long run link between the two variables would have been detected only if the coefficient of error correction term (ECT) in error correction equation with gross domestic investments/GDP would have been negative and statistically significant. But in our case the ECT is statistically significant but is not negative as expected.

Therefore, the results suggest long-term financial infrastructures which are necessary for successful promoting investments for spurring economic growth are still remain weak in Tanzania. Also, there is no evidence found supporting technological innovation channel link financial development and economic growth in Tanzania, since the error correction term (ECT) for error correction model with saving to GDP (S/GDP) was neither negative nor statistically significant.

5.6   Granger Causality Test Results

A granger causality test through VAR methods was employed to establish the direction of causality after being satisfied with the results from VECM, that there is evidence supporting existence of both short run and long run causality. The details of the results from a Pairwise granger causality test are as presented on the table 5.6 below. Decision to reject the null hypothesis in each case reached only where probability value (Prob) of the F statistics was less than significance levels of 1%, 5% and 10%.

Table 5.7: Pairwise Granger Causality Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision

Null Hypothesis	Obs	F-Statistic	Prob.	Decision
LNM2_GDP does not Granger Cause LNREAL_GDP_PERCAPITA	31	0.57988	0.567	Fail to reject
LNREAL_GDP_PERCAPITA does not Granger CauseLN M2_GDP		3.90165	0.033	Reject
LN LIQUIDITY_LIABILITY_GDP does not Granger Cause LNREAL_GDP_PERCAPITA	31	0.21291	0.8096	Fail to reject
LN REAL_GDP_PERCAPITA does not Granger Cause LNLIQUIDITY_LIABILITY_GDP		4.12977	0.0277	Reject
LNCREDIT_PVT_SECT_GDP does not Granger Cause LNREAL_GDP_PERCAPITA	31	3.44457	0.0471	Reject
LNREAL_GDP_PERCAPITA does not Granger Cause LNCREDIT_PVT_SECT_GDP		3.95318	0.0317	Reject
LN GROSS_DOMESTIC_INVESTIME does not Granger Cause LNREAL_GDP_PERCAPITA	31	3.02083	0.0661	Reject
LNREAL_GDP_PERCAPITA does not Granger Cause LNGROSS_DOMESTIC_INVESTIME		6.94938	0.0038	Reject
LNSAVINGS_GDP does not Granger Cause LNREAL_GDP_PERCAPITA	31	2.39948	0.1106	Fail to reject
LNREAL_GDP_PERCAPITA does not Granger CauseLN SAVINGS_GDP		2.2893	0.1214	Fail to reject
LNGROSS_DOMESTIC_INVESTIME does not Granger Cause LNM2_GDP	31	1.01503	0.3763	Fail to reject
LNM2_GDP does not Granger Cause LNGROSS_DOMESTIC_INVESTIME		4.32305	0.0239	Reject
LNSAVINGS_GDP does not Granger Cause LNM2_GDP	31	2.87322	0.0746	Reject
LNM2_GDP does not Granger Cause LNSAVINGS_GDP		2.26293	0.1242	Fail to reject

LN GROSS_DOMESTIC_INVESTIME does not Granger Cause LNLIQUIDITY_LIABILITY_GDP	31	0.97438	0.3908	Fail to reject
LNLIQUIDITY_LIABILITY_GDP does not Granger Cause LNGROSS_DOMESTIC_INVESTIME		2.65932	0.089	Reject
LNSAVINGS_GDP does not Granger Cause LNLIQUIDITY_LIABILITY_GDP	31	1.77997	0.1886	Fail to reject
LNLIQUIDITY_LIABILITY_GDP does not Granger Cause LNSAVINGS_GDP		1.29821	0.2901	Fail to reject
LNGROSS_DOMESTIC_INVESTIME does not Granger Cause LNCREDIT_PVT_SECT_GDP	31	0.04914	0.9521	Fail to reject
LNCREDIT_PVT_SECT_GDP does not Granger Cause LNGROSS_DOMESTIC_INVESTIME		9.12248	0.001	Reject
LNSAVINGS_GDP does not Granger Cause LNCREDIT_PVT_SECT_GDP	31	1.65812	0.21	Fail to reject
LNCREDIT_PVT_SECT_GDP does not Granger Cause LNSAVINGS_GDP		1.42114	0.2596	Fail to reject

Significance levels 1%, 5%, 10%

Source: Author, LN= log.

From Table 5.7, in the first two pairs null hypothesis that broad money supply to GDP (M2/GDP) does not granger cause real GDP per capita was not rejected at 5 percent of significance level since, the p-value of F-statistics 56.7 percent was higher than significance level 5 percent. This implied that broad money supply to GDP (M2/GDP) does not granger cause real GDP per capita and hence no causality was found. In the opposite null hypothesis that real GDP percapita does not granger causes M2/GDP was rejected at the significance level of 5 percent because the p-value of F-statistics 3.3 percent was less than 5 percent implying that, real GDP

percapita does granger causes broad money supply to GDP (M2/GDP) and causality is running from real GDP per capita to broad money supply to GDP (M2/GDP). The results suggest that there is unidirectional causality running from economic growth to financial development (Demand hypothesis) when M2/GDP is used .The demand following hypothesis confirmed on present study especially, when broad money supply to GDP is used contradicts with the findings confirmed by Odhiambo (2005).

In his study in Tanzania Odhiambo used broad money supply, Currency ratio and private bank claims and real GDP per capita and he confirmed that, finance leads to economic growth when broad money supply is used and when the other two used confirmed evidence of bidirectional causality. Present study has established evidence of demand following hypothesis when broad money supply to GDP is used as a measure of financial development within the estimated sampling period. Odhiambo study was limited only within the estimated sample period and was based on bivariate framework. It is not surprising that his results were biased because model estimated suffered from model specification bias.

However, Odhiambo (2011) study in Tanzania on financial deepening, capital inflows and economic growth using ARDL bound test with variables, broad money supply (M2/GDP), foreign capital inflows and real GDP per capita in a trivariate framework confirmed demand following hypothesis which is consistent with the present findings (demand following hypothesis when broad money to GDP is used). For the similarity of results (demand hypothesis) when broad money supply to GDP (M2/GDP) is used, may imply that the two techniques, granger causality through Co-integrated VAR and ARDL bound test is some cases are similar when similar

variables are used and level of development of financial sector is the same though not necessary, but this has to be justified by research works, by employing the two techniques together and examine whether they provide different or similar results and one can provide conclusion whether the causality in Tanzania is subjected to econometric techniques or not. It is therefore area left for further research.

In the Second pairs, the null hypothesis that Liquidity liability to GDP (LQL/GDP) does not granger causes real GDP per capita fail to reject the hypothesis since the p-value of F-statistics (80.9 percent) was higher than significance level of 10 percent, meaning that Liquidity Liabilities to GDP (LQL/GDP) does not granger causes real GDP per capita and hence no causality was found. In the opposite null hypothesis that, real GDP per capita does not granger cause Liquidity Liability to GDP (LQL/GDP) was rejected because the p- value of F-statistics 2.7 percent was less than significance level of 5 percent. This implies that real GDP per capita does granger cause Liquidity Liabilities to GDP (LQL/GDP) and the causality is running from real GDP percapita to Liquidity Liability to GDP (LQL/GDP).

The results suggest that there is unidirectional causality from economic growth to financial development (Demand following hypothesis) when liquidity liabilities to GDP are used. These findings contradicts with that of Chirstina Falle (2013) who only confirmed bidirectional causality results and especially when extended broad money supply to GDP (M3/GDP) was used as measure of financial development .The difference on the results is largely explained by difference on indicators in particular use of real GDP instead of real GDP per capita as used on the present study and sample size used in the study. Liu (2009) and Abu- Barber (2005)

emphasized researchers to use longer sample size for obtaining robust results on causality test.

From the third pairs of causality between real GDP per capita and credit pvt sect to GDP. The null hypothesis that credit pvt sect/GDP does not granger causes real GDP percapita was rejected since the p-value of F-statistics 4.7 percent was less than 5 percent of significance level, implying that credit to pvt sect/GDP does granger cause real GDP per capita and the causality run from credit to pvt sect/GDP to real GDP per capita. In the opposite null hypotheses that, the real GDP per capita does not granger causes private credit/GDP was also rejected because the p-value F-statistics 3.1 percent was below 5 percent of significance level, which means there was evidence of causality running from real GDP per capita to credit pvt sect/GDP.

Therefore, results suggest two ways causality or bidirectional causality between real GDP per capita and credit pvt sect/GDP. This means causality runs from one to another. These findings are contrary to Mbellenge and Aikaeli (2010) who only confirmed supply view in Tanzania. Their study used broad money supply to GDP and credit to private sector to GDP as measure of financial development and on economic growth used real GDP. However, present findings are consistent with that confirmed by Gin and Ndegien (2013), although their study used financial deepening indicators from cooperative societies (savings and credits to nominal GDP). Also, Christina Falle (2013) confirmed similar findings that there is bidirectional causality between financial development and economic growth in Tanzania.

Fourth pairs, causality between domestic investments/GDP and real GDP per capita. Null hypothesis that domestic investments/GDP does not granger causes real GDP per capita and likewise real GDP percapita does not granger causes domestic investments/GDP both were rejected at significance level of 10 and 1 percent respectively, because the p-values of F-statistics, 0.6 percent and 0.3 percent respectively were below the significance levels. The results suggest existence of bidirectional causality between domestic investments/GDP (capital accumulation) and real GDP per capita. Study by Suleiman Bader and Quan-Abu Aamer (2006) covering Middle Eastern and Northern African countries, when tested for causality from investments to GDP to Economic growth findings confirmed in all cases causality runs from investments to GDP to economic growth.

However, their study could not find evidence of causality from financial development to investments to GDP as confirmed on the present study. Further, the findings are in contrast with that of Eatzaz and Aisha (2009), which confirmed financial development, affects economic growth through its role in efficient resources allocation rather than its effects on capital accumulation. Their study was cross countries involving 38 developing countries. It is quite clear that in Literature review that cross countries studies cannot explain country specific issues and in designing specific policy is likely to be more difficult.

Fifth pair represents causality between savings/GDP and, real GDP percapita. In this pair null hypothesis was not rejected for causality from savings/GDP to real GDP per capita at significance levels and likewise the opposite hypothesis that real GDP per capita does not granger causes savings/GDP was not rejected because the p-values of

F-statistics 11 percent and 12 percent are higher than significance level of 10 percent. Conclusion was that savings to GDP and real GDP per capita are independent of each other. In other words, the results suggest that savings mobilized in the financial sector has not played significant role of promoting economic growth in Tanzania and economic growth has not supported savings mobilization. This could mean that household's income in Tanzania is either largely used for consumption or is not sufficient enough to keep savings through formal financial system. These findings contradict with that of Ang and Mackibbin (2005) in Malaysia. According to them high saving rate especially through employees compulsory savings has contributed to the economic development of Malaysia.

Sixth pairs, causality between gross domestic investments to GDP (I/GDP) and broad money supply to GDP (M2/GDP). From the table given, there is no evidence of causality from gross domestic investments to GDP (I/GDP) since null hypothesis was not rejected, because the p-values of F-statistics 37 percent was higher than significance level 10 percent. In other words, it implied that gross domestic investments to GDP (I/GDP) does not granger causes broad money supply to GDP (M2/GDP).

On the other side, the null hypothesis that broad money supply to GDP (M2/GDP) does not granger causes gross domestic investments to GDP (I/GDP) was rejected at significance level of 5 percent because the p-value of F-statistics 2.3 percent was less than the significance level of 5%. The results suggest there is unidirectional causality running from broad money supply to GDP (M2/GDP) to gross domestic investments to GDP (I/GDP). These findings imply that increase in money supply at reasonable

quantity within an economy is not disastrous but rather help promote domestic investments. Study by Abu- Bader and Abu Quarn (2005) in Egypt confirmed broad money supply minus currency in circulation to GDP (M2Y) affects economic growth only through increasing investment resources. This implies that financial sector allocates resources that promote investments and consequently affects economic growth.

Causality between savings to GDP (S/GDP) and broad money supply to GDP (M2/GDP), the results suggest that there is evidence of causality running from savings to GDP (S/GDP) to broad money supply to GDP (M2/GDP) because the p-values of F-statistics 7.4 percent is less than the significance level of 10 percent, in this case null hypothesis that savings to GDP (S/GDP) does not granger causes broad money supply to GDP (M2/GDP) was rejected. In other words savings to GDP (S/GDP) does granger causes broad money supply to GDP (M2/GDP). This implies that savings mobilization within financial system promotes financial sector development. However, according to Zinjaless and Rajan (1998), higher savings mobilization leads to the development of financial sector and affects future economic growth. In the opposite null hypothesis that broad money supply to GDP (M2/GDP) does not granger causes savings to GDP (S/GDP) was not rejected because the p-value of F-statistics 12.2 percent was higher than significance level of 10 percent.

Furthermore, pair of causality between gross domestic investments to GDP (I/GDP) and Liquidity Liabilities to GDP (LQL/GDP). From the table results given, there is no evidence of causality from gross domestic investments to GDP (I/GDP) to Liquidity liabilities to GDP (LQL/GDP) because; the p-value of F-statistics 39 percent

is higher than significance level of 10%. In other words, gross domestic investments to GDP (I/GDP) do not granger causes Liquidity Liabilities to GDP (LQL/GDP). In the opposite null hypothesis that Liquidity Liabilities to GDP (LQL/GDP) does not granger causes gross domestic investments to GDP (I/GDP) was rejected at significance level of 10 percent because, its F-statistics p-value 8.9 percent was less than the significance level of 10%. The results suggest that there is unidirectional causality running from Liquidity Liabilities to GDP (LQL/GDP) to gross domestic investments to GDP (I/GDP). This implies that, financial sector in Tanzania does its role of allocating resources which promotes domestic investments when Liquidity Liabilities is used as financial development indicator. These findings are in contrast with findings confirmed by Ang and Mckibbin (2005) in Malaysia.

According to them financial intermediaries in Malaysia do not seem to be efficient in ameliorating information asymmetries, reducing transactions costs and allocating resources. Pairs of causality test results between Savings to GDP (S/GDP) and Liquidity Liabilities to GDP (LQL/GDP). Null hypothesis that, Savings to GDP (S/GDP) does not granger causes Liquidity Liabilities to GDP (LQL/GDP) and vice versa fail to reject the hypothesis because, the p-values are much higher than the significance levels. Conclusion is that, the two variables are independent of each other. In other words there is no causality running from one to another.

In granger causality test results pairs between domestic investments/GDP and credit to private sector/GDP, the null hypothesis that domestic investments/GDP does not granger causes credit to private sector/GDP failed to reject at significance level of 5 percent due to higher p-value, of F-statistics 95.2 percent. The opposite null

hypothesis that credit to private sector/GDP does not granger causes domestic investments to GDP was rejected, because the p-value of F –statistics 0.1 percent was below the significance level of 1 percent. The results suggest that there is unidirectional causality running from credit to private sector to GDP to domestic investments to GDP. This implies that financial sector development in Tanzania promote domestic investments through allocation of credits to firms and individual businesses. Study by King and Levine (1993a), among other financial indicators used, they confirmed private credits from banks leads growth through either increasing investments efficiency or through increasing resources for investments.

Lastly, causality results between Savings to GDP (S/GDP) and credit to private sector to GDP (Credit pvt sect/GDP). The null hypothesis that Savings to GDP (S/GDP) does not granger causes and credit to private sector to GDP (Credit pvt sect/GDP) and vice versa fails to reject the hypothesis at significance levels. Conclusion is that there is no evidence of causality from running one to another between the two variables. The results suggest that the two variables are not related to each other.

In overall findings from the present study justify that results on the direction of causality in Tanzania is still mixed, and not only demand following hypothesis as confirmed by Odhiambo (2011) where using his findings for policy advice, the government would have obliged to pursue only policies of enhancing growth and expecting output growth promote financial sector development. In the present study, there is policy freedom to decide whether to deal with supply side or demand side policies to stimulate further economic development in Tanzania.

5.7   Variance Decomposition Results (VD)

A ten period of horizon was employed to convey sense of the system dynamic granger causal chain, which tend to suggest that real GDP percapita time series is the leading variable being the most exogenous of all, it followed with financial variables, domestic investments and savings. Since variance decomposition explains both short run and long run causality outside the estimated sampling, thus it was necessary to use assumption to distinguish both short run and long run causality results. In this case short run period was assumed to be 3 years and long run period 10 years because study uses annul time series data set. Thus, strengths of granger causality findings outside the estimated sample period are validated through following analysis.

From the results presented in Table 5.7, decomposition of real GDP percapita, in a short run shock to real GDP percapita (own shock) can cause 93% of variation in real GDP percapita, while shock to credit pvt sector/GDP can cause 1.2% of variation in real GDP percapita, and likewise shock to gross domestic investments/GDP causes 0.5% fluctuations/variations in real GDP percapita. In a long run almost story remain the same except for the own shock from real GDP percapita, which has decreased to 15.5%. The results suggest that credit pvt sector/GDP and gross domestic investments/GDP can cause fluctuations in real GDP percapita in a short run only since the magnitudes or story are almost similar in both short run and long run.

In line with the above findings decomposition of M2/GDP, in a short run its own shock can cause 51% of fluctuations in M2/GDP whereas, shock to real GDP percapita can cause 30% of fluctuations in M2/GDP. In a long run its own shock

(shock to M2/GDP) can cause 42% of fluctuations in M2/GDP while, shock to real GDP percapita can cause 27% of fluctuations in M2/GDP. The results suggest that real GDP percapita can cause fluctuations in M2/GDP in a short run only because the magnitude of fluctuations demonstrate decline from short run to a long run. There is no evidence of long run causality since there is no stead increase of magnitudes from short run to long run.

Further, decomposition of LQL/GDP, in a short run its own innovations can cause 41% of variations in LQL/GDP whereas, innovations to real GDP percapita can cause 20% of variation in LQL/GDP. In a long run its own innovations can cause 37% of fluctuations in LQL/GDP while, innovations to real GDP percapita can cause 23% of fluctuations in LQL/GDP. This result suggest that real GDP percapita can cause fluctuations in LQL/GDP in a short run because the magnitude of fluctuations are almost similar from short run to long run. In other words story remain the same in both short run and long run.

Furthermore, decomposition of credit pvt sector/GDP, in a short run its own shock can cause 46% of fluctuations in credit pvt sector/GDP whereas, innovations to real GDP percapita can cause 22% of variation in credit pvt sector/GDP. In a long run its own shock can cause 15% fluctuations in credit pvt sector/GDP while, innovations to real GDP percapita can cause 37% of fluctuations in credit pvt sector/GDP. The results suggest that real GDP can cause fluctuations in credit pvt sector/GDP in both short run and long run because the magnitude of fluctuations demonstrate steady increase from short run to long run and experience decline only from year 9 and 10.

Also, decomposition of gross domestic investments/GDP, in a short run its own impulse can cause 44% of fluctuations in domestic investments/GDP whereas, innovations to real GDP percapita can cause 12% of variation in domestic investments/GDP, innovations to M2/GDP can cause 13% of variation in domestic investments/GDP, impulse to LQL/GDP can cause 9% of fluctuations in domestic investments/GDP, shock to credit pvt sect/GDP can cause 19% of variation in domestic investments/GDP.

In a long run its own shock can cause 12% of fluctuations in domestic investments/GDP while, impulse to real GDP percapita can cause 36% of fluctuations in domestic investments/GDP, also shock to M2/GDP can cause 4% of variation in domestic investments/GDP and impulse to LQL/GDP can cause 34% of fluctuations in domestic investments/GDP, however, shock to credit pvt sect/GDP can cause 8% of variation in domestic investments/GDP. The results suggest that real GDP percapita can cause fluctuations in gross domestic investments/GDP in a short run because the magnitudes of fluctuations is not steady throughout from year 1 to 10.

In overall Variance decomposition (VD) results indicate that economic growth variable was the most exogenous leading variable than other variables, suggesting that financial sector has not played strong significant role in promoting economic growth in Tanzania because if it were, would have been a leading variable. Thus, study conclude that reforms embarked and especially financial sector reforms the gains still have long way to go to the expected level, to a point where it will play leading role of enhancing economic growth in a long run. Factors that might have

been impeded include the institutional environments, quality of institutions including judicial system, bureaucracy, law and order and property rights are of poor quality because these factors hinders commercial activities and investments to take place in a massive scale. Secondly, it suggest that proper infrastructures such as long-term financing that are necessary for successful promoting investments for spurring economic growth in a long run still remain weak in Tanzania. Lastly, though it is clear that, there have been clear improvements in the financial sector for the past two decades in Tanzania, but the degree which financial sector has promoted economic growth results confirmed suggest is still below the threshold needed to play leading role of enhancing economic growth in a long run.

5.8   Summary

All variables were tested for stationarity in their levels using ADF-test and the results confirmed non stationary status with unit roots at their levels. After taking first and second difference, all variables were stationary. Cointergration tested confirmed evidence of long run cointergration relationship between financial development and economic growth. Granger causality test has confirmed evidence of demand following hypothesis when monetary aggregate variables used, however bidirectional causality results detected when credit to private sector was used and in a long run causality runs from real GDP percapita to credit to pvt sector to GDP, even in outside the estimated sampling period. Lastly, financial sector has been effective in promoting economic growth in a short run only and gross domestic investments link them in a short run.

CHAPTER SIX

CONCLUSIONS AND POLICY RECOMMENDATIONS

6.1   Introduction

This chapter presents conclusions, policy implications, policy recommendations, and at the end provide area for further research.

6.2   Conclusion

This study intended to enhance understanding on how Tanzanian can be gauged in ongoing global debate on the direction of causality between financial development and economic growth through econometric techniques. There is large body of theoretical and empirical studies that support existence of strong positive relationship between financial development and economic growth. However the direction of causality has remained inconclusive and among other factors that account for inconclusiveness includes: application of different proxy measures, level of development of financial sector and sample size under study. It is clear that the early studies investigated the finance-growth nexus did not address question of causality due to application old techniques like rank correlation and OLS, which did not depict long run relationship between variables as presented on Literature review chapter.

However, with availability of time series data modern economists use cointergration techniques to examine long-run relationship and employ other advanced econometric techniques to address issues which the early studies did not take into account. The proper determination of these causal patterns between financial development and economic growth has important implications for policy makers about setting

appropriate macroeconomic policy and development strategy to adopt for instituting competitive economic growth in both short-run and long-run.

The aim of this study was to examine the causal relationship between financial development and economic growth in Tanzania within multivariate framework using three financial development indicators, (ratio of broad money supply to nominal GDP, liquidity liability to nominal GDP and credit to private sector to nominal GDP) and other three variables savings/GDP, Domestic investments/GDP and real GDP per capita as economic growth variable for the period between 1980- 2012.

Study employed econometric techniques in investigating the link by first testing for distribution of the variables using descriptive statistics, then tested for non stationary and stationary of the series using ADF-test, at their original levels and after differencing all variables respectively. The test provided results which indicates that the series of variables M2/GDP, liquidity liability to GDP, private credit/GDP, domestic investments/GDP, savings/GDP were integrated at order one I(1) and real GDP percapita I(2) which implied existence of unit roots and order zero I(0) implied series of variables were stationary after taking first difference for M2/GDP, liquidity liability/GDP , private credit/GDP, domestic investments/GDP, savings/GDP, but real GDP percapita became stationary after taking second the difference. The next step was to test for long run relationship between the two variables.

Long run equilibrium relationship tested through Johansen procedures, the test results confirmed existence of two cointergration relationships between financial development and economic growth. Further, Long-run and short-run causality tested

through vector error correction model (VECM) and the results confirmed existence of both short run and long run causality. In particular results from the VECM confirmed financial sector has been effective in promoting economic growth in a short run, also gross domestic investments/GDP links financial sector and economic growth in a short run. Finally a pairwise granger causality test was used to establish the direction of causality. A pairwise granger causality test results reveals evidence of unidirectional short- run causality running from economic growth to financial development (demand following hypothesis) when ratio of M2/GDP and liquidity liabilities/GDP used and bidirectional causality between financial development and economic growth when ratio credit pvt sect/GDP used, and in a rung run causality runs from real GDP per capita to credit to private sector to GDP.

The results are contrary to Mbellenge and Aikaeli (2010) who confirmed only supply hypothesis in Tanzania. Also, the demand hypothesis confirmed when monetary aggregates were used on the present study is consistent with findings confirmed by Odhiambo (2011) study in Tanzania.

6.3   Policy Implications

Present study has established evidence of unidirectional short-run causality running from economic growth to financial development (Demand following hypothesis) when monetary aggregates variables used. However, evidence of bidirectional causality between financial development and economic growth was detected when ratio of credit pvt sect/GDP was used, and in long run causality run only from economic growth to financial development. Gross domestic investments/GDP is the channel that links financial development and economic growth in a short run. In

terms of policy implications, Tanzanian case supports both supply and demand following hypothesis, suggesting policy makers/decision makers have policy freedom to decide. Also, it implies that to stimulate further economic development in Tanzania policy makers have freedom to decide either to deal with only supply side policies or demand side policies or adopt balanced policies in favour of both supply and demand side policies.

6.4   Policy Recommendations

In view of feedback effect results on the direction of causality between financial development and economic growth in Tanzania, in determination of policy, government or policy makers should utilize financial sector as a policy variable to accelerate economic growth. If further increase in growth rate and sustainable long-term economic development is desired in Tanzania, study recommends more efforts should be devoted to the deepening of financial sector by enhancing competition, improving business environment, investing on human resources and legal environment. Some of the immediate actions required to be taken among others it include the following.

Financial institutions should widen outreach of their services especially in rural areas where majority of population have not been served with their services, rather than being biased towards urban areas only. This will result to more mobilization of savings which consequently will contribute to the development of financial sector. In terms of promoting competition, foreign financial institutions should be encouraged or allowed to participate on the domestic financial markets. Because will bring new technologies and new financial products which ultimately will create

incentives for local financial institutions to compete and hence help on deepening financial sector. Also, government is required to take serious decisive steps to make the business environment friendlier for the operation of financial sector, and among other things, which need immediate action is abandon with bureaucratic procedures on providing business permits and licenses to investors.

Further, government should invest on human resources and especially by supporting students taking science subjects in secondary schools and Universities, because to develop competitive financial sector innovation is essential and is possible if there are well-trained experts. Thus, efforts towards deepening financial sector should go parallel with investments on human resources. Furthermore, creditor's rights should be protected because high degree of creditor's rights protection creates incentives for the entry of private financial institutions and especially foreign institutions, which automatically will enhance competition and deepen financial sector.

However, the challenge we see is for the government to continue with its efforts of fighting against corruption, because to build strong and competitive financial sector fair playing field/ground for all players is highly needed. Unfair playing field is more likely to discourage entry of new financial institutions and thus results to less competition in the financial sector, and weaker financial sector.

6.5 Area of Further Research

Present study did not use financial markets measures in the analysis, by the fact that financial markets in Tanzania are underdeveloped with young stock market established in 1996. Therefore it was not possible to include with other variables

with longer time series data from 1980. But other researchers can try to include and observe the results, though we believes will not alter the present study the results.

Also, future studies in Tanzania should try to examine whether causality is subjected to econometrics techniques. So far, causality in Tanzania has been examined by using Vector error correction model (VECM) under VAR framework and Autoregressive distributed bound test based on VAR. It is not clear whether the two techniques yield similar or different results once applied in one study.

Further, it would be better if future research will try to connect the finance –growth nexus with poverty reduction, to see whether the finance growth nexus is associated with poverty reduction in Tanzania.

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APPENDICES

Appendix I: Johansen Cointergration Equations

1 Cointegrating Equation(s):	Log likelihood	86.05796			

Normalized cointegrating coefficients (standard error in parentheses)

REAL_GDP...	M2_GDP	LIQUIDITY_L...	CREDIT_PV...	GROSS_D...	SAVINGS_GDP
1.000000	1197790.	-1153819.	-66404.56	-475420.9	125365.3
	(104802.)	(96122.4)	(126800.)	(115585.)	(61127.0)

Adjustment coefficients (standard error in parentheses)

D(REAL_G...	-0.091015
	(0.03313)
D(M2_GDP)	-2.68E-07
	(3.0E-07)
D(LIQUIDITY...	-2.15E-07
	(3.0E-07)
D(CREDIT_...	7.28E-07
	(1.9E-07)
D(GROSS_...	5.19E-07
	(2.1E-07)
D(SAVINGS...	7.64E-07
	(4.1E-07)

2 Cointegrating Equation(s):	Log likelihood	103.4299			

Normalized cointegrating coefficients (standard error in parentheses)

REAL_GDP...	M2_GDP	LIQUIDITY_L...	CREDIT_PV...	GROSS_D...	SAVINGS_GDP
1.000000	0.000000	-157303.0	-317945.8	-566513.7	411170.4
		(53856.4)	(163784.)	(158408.)	(79467.0)
0.000000	1.000000	-0.831962	0.210004	0.076051	-0.238610
		(0.05265)	(0.16012)	(0.15486)	(0.07769)

Adjustment coefficients (standard error in parentheses)

D(REAL_G...	-0.064198	-114660.9
	(0.04462)	(39552.0)
D(M2_GDP)	4.29E-07	-0.468209
	(3.4E-07)	(0.30500)
D(LIQUIDITY...	5.23E-07	-0.412873
	(3.5E-07)	(0.31050)
D(CREDIT_...	1.15E-06	0.782916
	(2.3E-07)	(0.20007)
D(GROSS_...	8.67E-07	0.547964
	(2.7E-07)	(0.24061)
D(SAVINGS...	-2.96E-08	1.081666
	(5.0E-07)	(0.44493)

Source: Author through E Views

.

Appendix II: Patterns of Financial Indicators in Tanzania from 1980- 2012
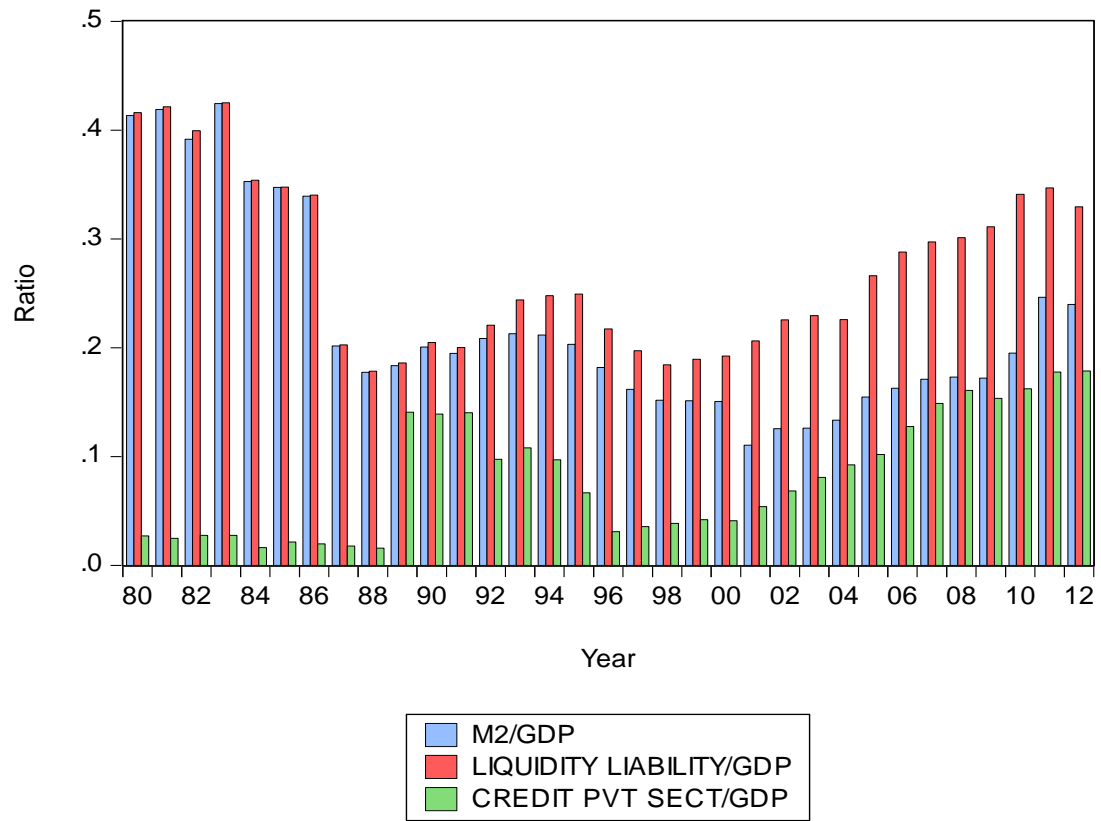
Source: Author using data from International Financial Statistics (IFS), IMF

Appendix III: Patterns of Real GDP Per Capital in Tanzania from 1980-2012

REAL GDP percapita
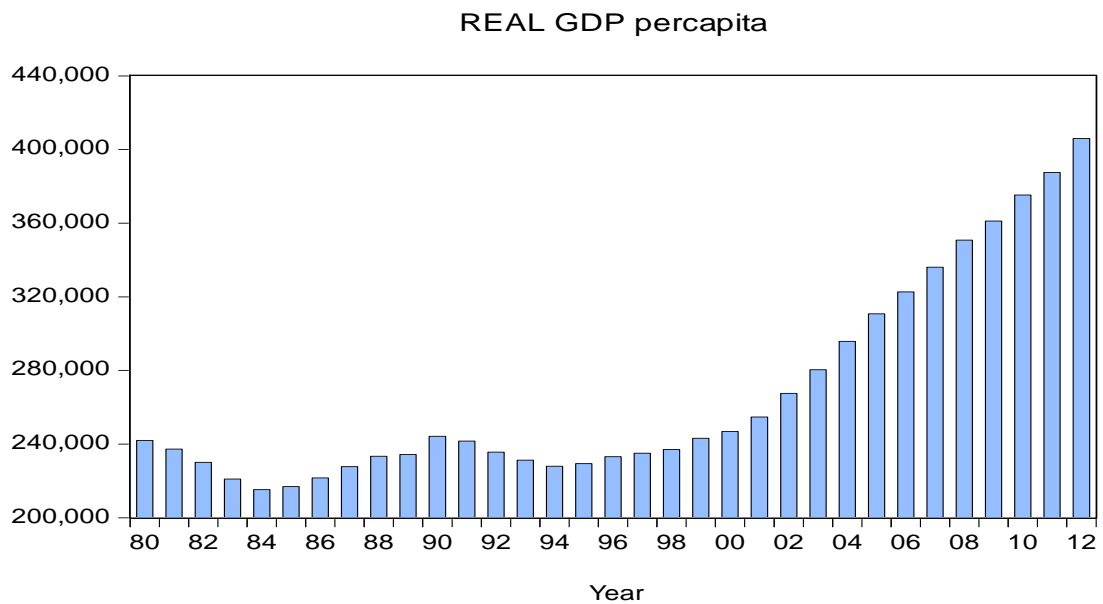
Source: Author using data from World economic indicators (WEO)

Appendix IV: Patterns of Real GDP Growth Rate in Tanzania from 1980-2012

Real GDP Growth AS%
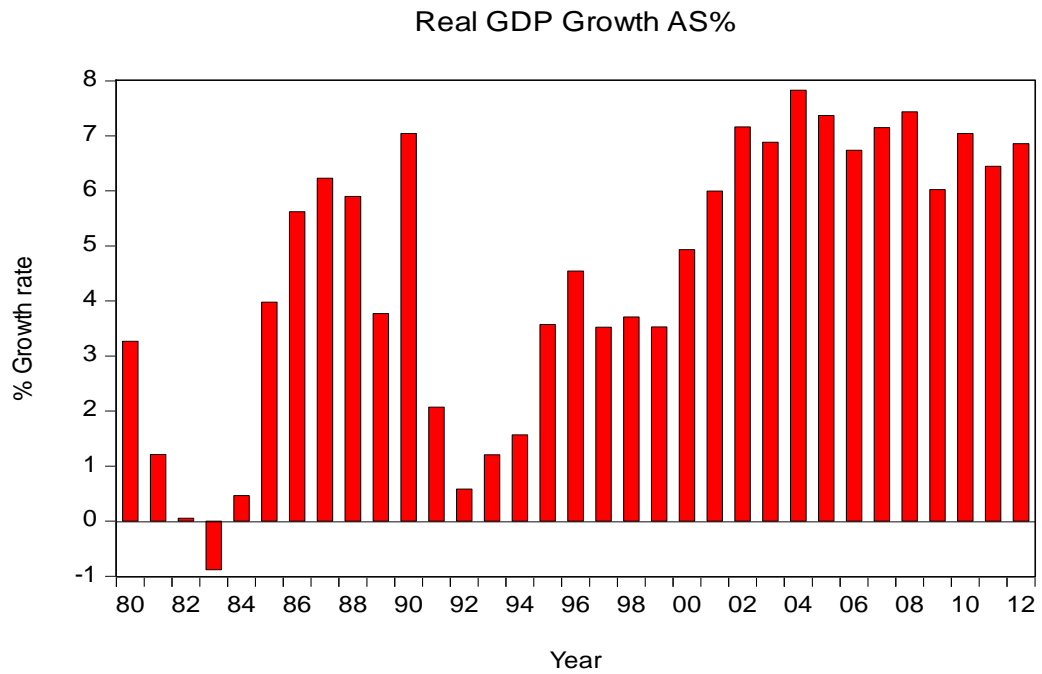
Source: Author using data from World Economic Indicators (WEO), World Bank

Appendix V: Error Correction Models

Dependent Variable, Real GDP per capita

	Coefficient	Std. Error	t-Statistic	Prob.
Independent variables				
ECT₁	*-0.004618*	*0.008429*	*-0.547878*	*0.585*
Real GDP percapita (1)	0.872632	0.215527	4.048838	0.0001
Real GDP percapita (2)	0.055966	0.220167	0.254196	0.7999
M2/GDP (1)	23228.77	60163.69	0.386093	0.7003
M2/GDP (2)	4401.339	76622.46	0.057442	0.9543
LIQUIDITY LIABILITY GDP (1)	-27191.19	52064.02	-0.522264	0.6027
LIQUIDITY LIABILITY GDP (2)	39953.64	67642.51	0.590659	0.5561
CREDIT/GDP(1)	71446.36	48859.28	1.462288	0.1469
CREDIT/GDP(2)	-42999.47	44421.86	-0.96798	0.3355
I/GDP(1)	-15541.5	43910.1	-0.353939	0.7242
I/GDP(2)	-51403.95	28285.13	-1.817349	0.0723
S/GDP(1)	-14112.34	17747.51	-0.795173	0.4285
S/GDP(2)	-9890.786	19078.57	-0.518424	0.6054
Constant	1592.409	1073.324	1.483624	0.1412

Where, R-Square = 0.85

Dependent Variable, M2/GDP

	Coefficient	Std. Error	t-Statistic	Prob.
Independent variables				
ECT₂ C(15)	*8.22E-08*	*8.46E-08*	*0.971353*	*0.3338*
Real GDP percapita (1)	2.13E-07	2.16E-06	0.098583	0.9217
Real GDP percapita (2)	1.92E-06	2.21E-06	0.869856	0.3865
M2/GDP (1)	-0.798728	0.603845	-1.322738	0.1891
M2/GDP (2)	-0.106761	0.769037	-0.138825	0.8899
LIQUIDITY LIABILITY GDP C(1)	0.552292	0.522551	1.056915	0.2932
LIQUIDITY LIABILITY GDP C(2)	0.141423	0.678907	0.208309	0.8354
CREDIT/GDP(1)	-0.130974	0.490386	-0.267084	0.79
CREDIT/GDP(2)	-0.248591	0.445849	-0.557568	0.5784
I/GDP(1))	0.210592	0.440712	0.477844	0.6338
I/GDP(2)	0.06694	0.283889	0.235795	0.8141
S/GDP(1)	-0.196666	0.178126	-1.104083	0.2723
S/GDP(2)	0.029744	0.191486	0.155332	0.8769
Constant	-0.017545	0.010773	-1.628652	0.1067

Where , R-Square = 0.27

	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable, LIQUIDITY LIABILITY/GDP				
Independent variables				
ECT₃ C(29)	*5.15E-08*	*8.47E-08*	*0.607897*	*0.5447*
Real GDP percapita (1)	-1.35E-06	2.17E-06	-0.622855	0.5349
Real GDP percapita (2)	3.11E-06	2.21E-06	1.405426	0.1631
M2/GDP (1)	-0.800888	0.60454	-1.324788	0.1884
M2/GDP (2)	-0.067934	0.769922	-0.088234	0.9299
LIQUIDITY LIABILITY GDP (1)	0.654145	0.523153	1.25039	0.2142
LIQUIDITY LIABILITY GDP (2)	0.106599	0.67969	0.156835	0.8757
CREDIT/GDP(1)	-0.091985	0.490951	-0.187361	0.8518
CREDIT/GDP(2)	0.026493	0.446362	0.059354	0.9528
I/GDP(1)	0.024836	0.44122	0.05629	0.9552
I/GDP(2)	-0.03467	0.284216	-0.121984	0.9032
S/GDP(1)	-0.114706	0.178332	-0.643217	0.5216
S/GDP(2)	0.039895	0.191706	0.208103	0.8356
Constant	-0.012115	0.010785	-1.123286	0.2641
Where, R-Square = 0.27				

	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable, CREDIT PVT SECT/GDP				
Independent variables				
ECT₄ C(43)	*-1.18E-07*	*3.28E-08*	*-3.584882*	*0.0005*
Real GDP percapita (1)	-2.88E-07	8.39E-07	-0.34378	0.7318
Real GDP percapita (2)	1.36E-06	8.57E-07	1.590834	0.1149
M2/GDP (1)	0.148565	0.234177	0.634414	0.5273
M2/GDP (2)	0.016318	0.29824	0.054715	0.9565
LIQUIDITY LIABILITY GDP (1)	0.038809	0.20265	0.191507	0.8485
LIQUIDITY LIABILITY GDP (2)	-0.416865	0.263287	-1.583313	0.1166
CREDIT/GDP(1)	0.425677	0.190176	2.238329	0.0275
CREDIT/GDP(2)	0.427865	0.172904	2.474573	0.0151
I/GDP(1)	-0.398756	0.170912	-2.3331	0.0217
I/GDP(2)	-0.446615	0.110095	-4.056637	0.0001
S/GDP(1)	-0.044387	0.069079	-0.642556	0.522
S/GDP(2)	0.098731	0.07426	1.329527	0.1868
Constant	-3.84E-05	0.004178	-0.0092	0.9927
Where, R-Square = 0.83				

| *Dependent Variable, I/GDP* | | | |
Coefficient	Std. Error	t-Statistic	Prob.
Independent variables			
ECT₅ C(57)	*1.67E-07*	*3.74E-08*	*4.473877*	*0.0000*
Real GDP percapita (1)	2.03E-06	9.56E-07	2.120968	0.0365
Real GDP percapita (2)	6.35E-08	9.77E-07	0.065009	0.9483
M2/GDP (1)	0.125343	0.266918	0.469592	0.6397
M2/GDP (2)	0.054014	0.339938	0.158895	0.8741
LIQUIDITY LIABILITY GDP C(1)	-0.015703	0.230984	-0.067981	0.9459
LIQUIDITY LIABILITY GDP C(2)	-0.34134	0.300098	-1.137427	0.2582
CREDIT/GDP(1)	-0.143928	0.216766	-0.66398	0.5083
CREDIT/GDP(2)	-0.763183	0.197079	-3.872471	0.0002
I/GDP(1)	0.435425	0.194809	2.235141	0.0277
I/GDP(2)	0.053148	0.125488	0.423528	0.6729
S/GDP(1)	0.091306	0.078737	1.159631	0.2491
S/GDP(2)	0.243199	0.084643	2.87324	0.005
Constant	-0.003804	0.004762	-0.798906	0.4263

Where, R-Square = 0.86

| | *Dependent Variable, S/GDP* | | | |
	Coefficient	Std. Error	t-Statistic	Prob.
Independent variables				
ECT₆	*5.50E-08*	*9.66E-08*	*0.569022*	*0.5707*
Real GDP percapita (1)	2.58E-07	2.47E-06	0.104607	0.9169
Real GDP percapita (2)	2.79E-06	2.52E-06	1.106924	0.2711
M2/GDP (1)	-0.097116	0.689353	-0.14088	0.8883
M2/GDP (2)	-0.292219	0.877936	-0.332847	0.74
LIQUIDITY LIABILITY GDP (1)	0.127414	0.596547	0.213586	0.8313
LIQUIDITY LIABILITY GDP (2)	-0.663717	0.775045	-0.85636	0.3939
CREDIT/GDP(1)	-0.612283	0.559827	-1.0937	0.2768
CREDIT/GDP(2)	0.474728	0.508984	0.932698	0.3533
I/GDP(1)	0.282868	0.50312	0.562228	0.5753
I/GDP(2)	0.041252	0.32409	0.127286	0.899
S/GDP(1)	-0.043009	0.20335	-0.211504	0.8329
S/GDP(2)	-0.529387	0.218601	-2.421701	0.0173
Constant	-0.013953	0.012298	-1.134567	0.2594

Where, R-Square = 0.52

Significance 1%,5% and 10%
Source; Author

Appendix VI: Table 5.1 Variance Decomposition Results

Variance Decomposition of REAL_GDP_PERCAPITA:

Period	S.E.	REAL_GDP_ PERCAPITA	M2_GDP	LIQUIDITY_ LIABILITY_ GDP	CREDIT_PVT _SECT_GDP	GROSS_DOM ESTIC_INVES TIME	SAVINGS_G DP
1	3625.618	100	0	0	0	0	0
2	6494.843	95.59453	1.474045	0.064019	2.256075	0.539284	0.072048
3	9093.357	93.53713	2.221421	1.885482	1.200406	0.548938	0.606618
4	11786.73	85.65716	5.666081	5.989331	1.186629	0.964005	0.536797
5	14812.55	73.13746	7.232018	14.99669	2.673511	1.490818	0.469509
6	18295.16	57.35208	8.893814	26.78212	4.153981	2.173603	0.644395
7	22407.42	41.99905	9.835673	39.46146	5.354747	2.498806	0.850257
8	27220.71	29.71426	10.58137	50.11498	6.143591	2.565559	0.880235
9	32503.7	21.1738	10.94962	57.97766	6.585013	2.521272	0.792638
10	37922.86	15.59682	11.25771	63.24149	6.714616	2.482363	0.707004

Variance decomposition of M2_GDP

Period	S.E.	REAL_GDP_ PERCAPITA	M2_GDP	LIQUIDITY_ LIABILITY_ GDP	CREDIT_PV T_SECT_GD P	GROSS_DOM ESTIC_INVES TIME	SAVINGS_G DP
1	0.028124	15.24292	84.75708	0	0	0	0
2	0.036331	30.65242	61.3545	1.462364	2.205962	3.35778	0.966972
3	0.043375	30.04498	51.64764	1.769555	2.538332	10.96876	3.030737
4	0.046723	27.05407	49.55094	1.558261	2.720963	13.82839	5.28738
5	0.049257	24.43817	49.9657	2.19417	3.825099	14.1958	5.381057
							4.922442
7	0.05348	21.20815	47.24865	6.601526	6.197348	14.14639	4.59793
8	0.055344	21.8062	45.2885	8.34757	6.258999	13.81682	4.481914
9	0.057002	23.74029	43.50027	9.07885	6.122509	13.25067	4.307409
10	0.058207	26.03405	42.13089	8.954621	5.955178	12.79387	4.131391

Variance Decomposition of LIQUIDITY_LIABILITY_GDP:

Period	S.E.	REAL_GDP_ PERCAPITA	M2_GDP	LIQUIDIT Y_LIABILI TY_GDP	CREDIT_PV T_SECT_GD P	GROSS_DOM ESTIC_INVES TIME	SAVINGS_ GDP
1	0.028563	9.027801	59.32137	31.65083	0	0	0
2	0.039877	20.50211	35.58757	40.88033	0.597389	2.377312	0.05528
3	0.048482	20.08152	27.36691	41.22151	0.444571	8.016982	2.868498
4	0.051899	18.44039	25.0562	41.63393	0.403476	9.73339	4.732614
5	0.052968	17.81744	25.43983	41.19975	0.708489	10.0715	4.762985
6	0.053401	17.5304	25.51149	40.64745	1.334899	10.21207	4.763698
7	0.053668	17.69945	25.34509	40.24445	1.632188	10.36231	4.716517
8	0.054217	19.10848	24.84675	39.43343	1.642074	10.24648	4.722788
9	0.055028	21.41409	24.12056	38.30219	1.597753	9.948423	4.616985
10	0.055915	23.55481	23.39963	37.35102	1.550763	9.64955	4.494226

Variance Decomposition of CREDIT_PVT_SECT_GDP:

Period	S.E.	REAL_GDP_P ERCAPITA	M2_GDP	LIQUIDIT Y_LIABILI TY_GDP	CREDIT_PV T_SECT_GD P	GROSS_DOM ESTIC_INVES TIME	SAVINGS_ GDP
1	0.018531	0.403898	1.358515	0.000878	98.23671	0	0
2	0.022035	6.994307	1.720577	0.120507	86.45936	4.425506	0.279741
3	0.030865	22.6371	4.0521	16.81203	46.43984	3.129262	6.929661
4	0.039892	38.50724	2.461441	23.13452	27.87269	1.879763	6.14434
5	0.04682	42.18616	1.977519	28.37437	20.62561	2.043533	4.792815
6	0.050392	43.95346	1.820513	28.86163	17.82653	2.173767	5.364095
7	0.052237	45.78369	2.429753	27.16288	16.87862	2.381665	5.363383
8	0.053989	46.01427	2.71595	26.70886	16.94708	2.570274	5.043563
9	0.056664	42.83195	3.008284	30.13651	16.6431	2.717468	4.662691
10	0.060779	37.29268	3.320794	36.91817	15.62856	2.60513	4.234673

Variance Decomposition of GROSS_DOMESTIC_INVESTIME:

Period	S.E.	REAL_GDP_ PERCAPITA	M2_GDP	LIQUIDITY _LIABILIT Y_GDP	CREDIT_PVT _SECT_GDP	GROSS_DOME STIC_INVESTI ME	SAVINGS_G DP
1	0.021546	12.76789	1.448857	3.875859	3.785741	78.12166	0
2	0.026579	10.31699	18.21151	5.635428	12.94306	52.33673	0.556279
3	0.031481	12.46177	13.22591	9.499617	19.28924	44.25667	1.266793
4	0.039248	24.28136	8.559972	18.12275	13.77297	31.23671	4.026234
5	0.046657	35.84019	6.059352	23.0813	9.835556	22.11492	3.068682
6	0.051409	40.63195	4.990878	24.20169	8.166294	18.78675	3.222438
7	0.053578	43.42071	4.716083	22.74082	7.54735	17.62176	3.953277
8	0.055437	44.55504	4.888212	22.37362	7.726085	16.62359	3.833453
9	0.058803	42.00091	4.903406	26.39422	8.30716	14.97901	3.415298
10	0.063968	36.2384	4.88211	34.54253	8.449994	12.92176	2.96521

Variance Decomposition of SAVINGS_GDP:

Period	S.E.	REAL_GDP_ PERCAPITA	M2_GDP	LIQUIDITY _LIABILIT Y_GDP	CREDIT_PVT _SECT_GDP	GROSS_DOME STIC_INVESTI ME	SAVINGS_G DP
1	0.040383	16.98101	0.005852	0.309023	4.914518	2.433279	75.35632
2	0.052326	27.97253	7.348227	0.275193	4.610267	4.468025	55.32575
3	0.060984	27.29757	5.45359	14.86578	8.06608	3.555062	40.76192
4	0.068337	27.36198	4.364364	25.23518	7.026722	2.948945	33.06281
5	0.074003	28.9566	4.038963	29.96399	5.992104	2.712476	28.33586
6	0.076623	31.37984	3.79184	29.73902	5.770791	2.844271	26.47424
7	0.077567	32.4317	3.707098	29.02111	5.79713	3.024539	26.01842
8	0.078622	32.03562	3.632166	29.92574	5.990047	2.982203	25.43422
9	0.081013	30.25131	3.617476	33.05944	6.269714	2.825864	23.97619
10	0.084807	27.60495	3.553752	37.87069	6.477291	2.609277	21.88404

Cholesky Ordering: real GDP precipitate, financial variables, domestic investment /GDP and savings/GDP