**The Link between Financial Development and Economic Growth in Ethiopia**

**JIMMA UNIVERSTY**

**COLLEGE OF BUSINESS AND ECONOMICS**

**DEPARTMENT OF ECONOMICS**

**A Thesis Submitted to the School of Graduate Studies of Jimma University in Partial Fulfillment of the Requirements for the Degree of Masters of Science in Economics Policy Analysis**

**BY: TAGAY SOBOKSA**

**MAIN ADVISOR: LETA SERA (DR)**

**CO-ADVISOR: TEKLU TADESSE (MSC)**

**JULY, 2020 G.C**

**JIMMA, ETHIOPIA**

## Thesis Declaration

This is to certify that the thesis prepared by Tagay Soboksa, entitled: "Link between Financial Development and Economic Growth Ethiopia" is my original work for the fulfillment of the requirement for the award of Master of Science degree in Economics policy analysis at the department of Economics, Jimma University. I declare that it has not been presented for the award of any masters or similar tittles in any other institution of higher learning to the best of my knowledge, and all resources have been duly acknowledged

Declared by:

Name: Tagay Soboka  Date: _____ Signature: _____

As thesis advisors, we hereby confirm that this thesis is the output of research undertaken by Tagay Soboka under our supervision and that it is submitted for the M.Sc. Degree in Economics policy analysis award. Confirmed by: Advisors

Main advisor: Leta Sera (DR)

Signature: _____ Date: _____

Co-advisor: Teklu Tadase. (M.Sc.)

Signature: _____ Date:_____

**JIMMA UNIVERSITY**

**COLLEGE OF BUSINESS AND ECONOMICS**

**DEPARTMENT OF ECONOMICS**

**The Link between Financial Development and Economic Growth in Ethiopia**

**Approved by the examining committee:**

**Chairman:** _____ **Signature:** _____ **Date:** _____

**External Examiner:** _____ **Signature:** _____ **Date:** _____

**Internal Examiner:** _____ **Signature:** _____ **Date:** _____

Abstracts

*This paper investigates linkage between financial development and economic growth in Ethiopia during the period from 1975 to 2016 using Autoregressive Distributed Lag (ARDL) approach. The paper also schedules Vector Error Correction Model (VECM) in order to observe how fast the co-integrated variables convergence in long-run. Accordingly, the results of bound test confirm existence of the long-run relationship between explanatory variables and economic growth. The empirical results show evidence of long-run and short-run positive impacts of financial development on economic growth in Ethiopia which implies that progresses in financial sector contribute to economic growth in both short-run and long-run. In consideration of few control variables, the study finds all indicators, except inflation and government expenditure, significantly influence economic growth in the long-run. However, it also reveals that government expenditure, trade openness, private credit sector, and bank liquidity ratio are pioneering determinants the economic growth in Ethiopia in short-run. Moreover, the study employs Granger causality tests in order to show direction of impact is running from financial development to economic growth both in short-run and long-run. As a result, it finds that the supply-leading hypothesis holds in Ethiopia and the policy implication is that long-run policies of financial development are believed to provide significant effect on economic growth.*

***Keywords**: Financial Development; Economic Growth; ARDL Bound Test; VECM; Granger Causality Test.*

## Acknowledgement

I would like to express my heartfelt appreciation to my advisors Leta Sera (DR) and Teklu Tadase (MSc.) for their close follow-up and valuable comments on both the proposal and the final paper. I am very thankful for the support they have been providing me in all the steps of this research wok including paper proofing and editing. I would like to extend my gratitude to all the people and organizations that have helped me providing all the necessary data and financial support for the study.

Table of contents

List of Tables and Figures

List of TABLES

List of Figure

## Acronyms and Abbreviations

**ADF**   Augmented Dickey-Fuller

**AIC**   Akaike Information Criteria

**CBE**   Commercial Bank of Ethiopia

**ECM**   Error Correction Model

**EIC**   Ethiopian Insurance Company

**EPRDF**   Ethiopian People's Revolutionary Democratic Front

**GDP**   Gross Domestic Product

**IRF**   Impulse Response Function

**MEDaC**   Ministry of Economic Development and Cooperation

**NBE**   National Bank of Ethiopia

**OLS**   Ordinary List Squares

**SVAR**   Structural Vector Auto Regressive

**TGE**   Transitional Government of Ethiopia

**VAR**   Vector Auto Regressive

**VEC**   Vector Error Correction Model

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of Study

Financial development is considered as one of the important inputs needed for economic growth and development. This is because of that the financial sector development determines the level of domestic saving distributed towards to productive investments in which efficient resources mobilization and credit expansion raise the level of investment thereby capital accumulation in a given economy. The capacity of the financial sector of the economy to provide capital for investment is an essential determinant of economic growth and transformation (Dejene, 2016).

As result, financial development is linked to economic growth due to having various functions, includes financial intermediation, reduction of transaction costs, and the possibility for diversification. The overall functions of financial institution come up with an improved accumulation of capital, efficient allocation of economic resources and improvement in technological capability which are crucial ingredients for economic growth (Levine, 2004). Furthermore, financial institutions make the linkage between the surplus and deficit sectors of the economy through intermediation. Accordingly, a well-functioned financial institution reduces dependence on external source financing; because of that external financing constraints provoke credit expansion thereby affecting the expansion of firms and industries as whole (Mishkin, 2007)

For long period of time, both theoretical and empirical analysis argued that financial sector development comprises an important mechanism for long run economic growth through effective mobilization of domestic savings for productive investment, thereby alleviation of poverty especially for developing nations (Ellahi, 2011).

In line with that there are various studies have done in identifying the relation between financial development and economic growth. However, there is no cross-cutting consensus arrived on such linkage. A massive theoretical and empirical investigation witnessed that financial development leads to economic growth. Empirical analysis undertaken by those researchers such

as Habibullah and Eng (2006); Ang (2008); Giuliano and Ruiz-Arranz(2009) and Nkoro and Uko(2013) support this positive relationship. According to finding, financial sector development creates strong environment for investment through efficient allocation of funds and also strengthen trade and business linkages and technological diffusion and innovation. These outcomes are captured mainly through mobilizing savings for productive investment and thereby accelerate economic growth. Another empirical evidence made by some of scholars like Sunde (2013), Odhiambo (2008), Waqabaca (2004)and Agbetsiafa(2004) still suggest that economic growth creates demand for financial services and therefore economic growth precedes financial development. Unlike to above argument, the finding of Adusei(2012) that financial development play insiginificant role in promoting economic growth.

In Ethiopia case, from 1974-1975 the Derg regime carried out a wide range of political, social and Economic reforms. Unfortunately, these reforms also promised more than they delivered. The government's expenditure was higher than its revenue generation capability which led to the poor performance of the economy (MEDaC, 1999). Extensions of credit to Sectors other than the central government grew slowly because of the restrictions on the Economic activities of the private sector. The national plan adopted by the government regulated and directed the activities of Financial institutions to only finance the public projects. The Derg policy of expanding. The public and socialized sector at the expense of the private sector also proved to be a Failure because of inadequate monetary policy which impaired the development of the financial sector. Relative stability in macroeconomic situations was achieved at the cost of overall economic growth because of the restriction on private sector participation and Low productivity of the social sector (MEDaC, 1999).

In 1991 the EPRDF came to power with a variety of reforms that are aimed at improving macroeconomic stability, accelerating economic growth, and reducing poverty. The government adopted a market-oriented economic policy which brought about a significant change in the functioning of the financial sector. Unlike the Derg regime, the financial sector served the private sector and new financial institutions also emerged (Alemayehu, 2006). Although state control has been reduced and domestic and foreign (Private) investment promoted, the state still plays a dominant role in the economy today. The financial sector is highly regulated by means of credit restriction, equity market Control and foreign exchange control. Furthermore, the Ethiopian

banking sector remained isolated from the impact of globalization. Although Ethiopian policy makers understand the potential importance of financial liberalization, it is widely believed that liberalization may result in a loss of control over the economy and may not be economically beneficial (Wondaferahu, 2010).

When looking up the structural transformation of the sector, Ethiopia has enjoyed strong economic performance since the mid-2000s which has helped turn Ethiopia into one of the fastest growing non-oil producing economies on the continent, with average annual growth rates above 11 percent between 2004 and 2008 - driven mainly by the agriculture and services sectors. Currently, Ethiopia has recorded a rapid economic performance of 10.2 percent in 2015; continuing the double-digit growth trend with the broad contribution of all sectors in which industry grew by 21.6 percent, services sector by 10.2 percent and agriculture by 6.4 percent. Regarding the share in GDP, agriculture, industry, and service sector share of GDP were 38.8 percent, 15.2 percent and 46.7 percent, as well as their contribution to annual growth, were 3.0 percent, 4.7 percent and 2.5 percent respectively revealing that there is gradual structural transformation (NBE, 2016).

## 1.2 Statement of the problem

They are several researcher likes King and Levine (1993), Levine and Zervos (1998) and Beck and Loayza (2000) have been conducted to highlight the significance of financial Development to economic growth and the correlation between the two. Some of the Studies suggest that in the early stages of development, financial development leads to Growth, while in later stages growth may determine the speed of financial development. When an economy starts to grow it creates immediate additional demand for financial Services and helps grow a better financial system. At this stage the positive impact of financial system on economic growth could be modest. As development proceeds, a better and well-functioning financial system is established.

As financial liberalization index shows, which measures banking security and independence from government control, on a scale of 10-100(100 being most liberal), Ethiopia stands at the 20th place which is lowest in sub-Saharan Africa(Dailami, 2000). On the other hand, a well-developed financial system can contribute at a greater extent to Income growth by reducing market frictions (including information and transaction Costs), pooling risks and easing trade

(Levine 1997). However, the causal relationship, that is weather financial development causes growth or economic growth causes financial development remains unclear.

In the case of Ethiopia, it is difficult to identify the relationship because of the unstable Macroeconomic environment and the underdevelopment of the financial system. Despite the effort made to develop the country in the past, the financial system of Ethiopia is too weak to support the private sector. This underdevelopment imposes heavy costs on Potential investors and traders. Moreover Ethiopia's financial sector is characterized by Dominance of state ownership and low level of development with the Commercial Bank of Ethiopia accounting for 90 per cent of total deposit (Alemayehu, 2006). This bank Controls 2/3 of the assets of the entire banking system (NBE, 2015/16). Ethiopia's financial sector is rudimentary and is dominated by the banking system. Ethiopia has no Capital market and very limited informal investment in shares of private companies. Currently, the sector includes 17 banks, 14 insurance companies, around 30 microfinance Institutions, over 700 savings and credit cooperatives and a Social Security Authority (NBE, 2015/16). Ethiopia still remains a highly under-banked country in the world, that is, supply of the Banking service is growing from year to year but it has not led to an increased outreach of the banking system at large. Unorganized active informal financial market such as "idir", "equb" and "mahber" are present. Many companies are established by issuing shares in the various sectors of the economy. Money markets are not developed and there is only a thin primary market for treasury Bills and weak inter-bank money market. Except government issued bonds, all types' of Capital markets including stock exchange and equity markets are missing. The regulatory and institutional framework for this market is not developed yet (HaileKibret and Kassahun, 2011). The number of population that uses financial Institutions is only 5 million of the total 89 million and the number of bank branch Located in urban areas is 60%, while 85% of the population is in rural area (World Bank). Access to financial services to the wider public is limited.

Ethiopia's financial sector development, as measured by the financial indicators such as Private credit to GDP, the ratio of narrow to broad money and the ratio of broad money to GDP, is well below that of other African countries, and is even more undeveloped when Compared to the financial systems of the industrial countries (Abdi, 2000). A developed and efficient financial system is important to mobilize savings and foreign Resources and to allocate them to high

return investment. In addition, if financial services are extended to rural and poor producers, a developed financial system is a strong tool to reduce poverty and promote growth (Abdi, 2000). The inefficiency of these financial sectors will raise the transaction cost and channel savings of households into physical Assets which in turn reduces investment and hence, reduce growth. Due to the missing markets, the only financial assets available to investors other than bank deposits are treasury bills of short term maturity. There is also a huge gap between savings and investment which the Ethiopian financial sector is unable to bridge and hence led to foreign borrowing to finance investments. In general the financial sector of Ethiopia needs deep understanding so as to find the clear Impact it has on the economy. The works of HaileKibret and Kassahun (2011) Evidence that shows the link between financial development and economic growth using Data of Ethiopia from 1972-2010. Their study employed liquid liability as a financial indicator and found a positive link between the two.

The study added value to the previous studies in Ethiopia by using more recent data, controlling for other factors that affect growth and finance used a methodology of the ARDL bound test for co-integrations. The study was distinguished between long-run and short run causality. This is because the effect of high financial development and economic growth can be realized in the short run but in the long run they may disappear.

In this study in detail investigates the causality between financial development and economic growth by using time series data of over the period 1975–2016G.C. the researcher deals with multivariate causality between financial development and economic growth to check whether short run or long run causality exists in which previous studies failed to address the omitted variables biasedness raising from bi-multivariate causality.

Ethiopia still characterized by under-banked country in the world and low level of financial sector on contributions of economic development. Financial sector is also not well developed as compared to as compared to African and world countries. Moreover, most of earlier studies conducted in Ethiopia used only one proxy for financial development which might come up with misleading the conclusion.

## 1.4 General objective:

The general objective of this paper is to investigate the causal relationship between financial development and economic growth using time series data over the period 1975–2016.

### 1.4.1 Specific objectives

❖ To determine econometrically the causal links between financial development and economic growth in Ethiopia.

❖ To distinguish long run or short run relationship between financial development and economic growth.

❖ To come with policy options to the policy makers need to consider.

☞ Research Questions

The study critically investigates the following research questions regarding the link between financial development and economic growth in Ethiopia.

1.  Does financial development cause economic growth?

2. Does economic growth propel financial development?

3. Does the financial system contribute to the process of economic growth in the long- run?

4. To what extent does financial system affect economic growth?

☞ Research hypotheses'

The following hypotheses developed to break down to answer the research questions. Therefore, this research work attempted to test the following hypotheses in case of financial development proxy in Ethiopia.

HP1: There is positive relationship between money supply proxy financial development and economic growth (GDP)

HP2: There is positive relationship between bank liquidity ratio proxy of financial development and economic growth (GDP)

HP3: There is positive relationship between private sector credit proxy of financial development and economic growth (GDP)

HP4: There is positive relationship between government expenditure proxy of financial development and economic growth (GDP)

HP5: There is positive relationship between inflation proxy of financial development and economic growth (GDP)

HP6: There is positive relationship between trade openness proxy of financial development and economic growth (GDP)

## 1.5 Significance of the Study

Studying causality between financial development and economic growth in Ethiopia help not only to answer the question, whether the causality exists or not, the direction of the causality and whether long run or short run causality results. Rather it helps the country to promote economic growth by increasing financial sector for sustainable development and forwards an idea to be integrated as part of sound policy apparatus for alleviating some bottleneck of the sector based on outcomes of the study.

Additionally, it is also expected to fill the knowledge gap in the area and contribute some empirical literature for the study to be conducted for the future in financial nexus economic growth .Knowing the direct relationship between financial development and growth is not sufficient by itself, however if proper policy is to be formulated, this information is going to play a vital role for designing proper policy and fill the knowledge gap Thus, an analysis of causal relationship between financial development and The study may yield results that will assist in deciding on how resource allocation should be achieved between financial development and the real sector development.

## 1.6 Scope of the study

The scope of this study is limited in terms of coverage and method. With regard to coverage, it is limited to the Ethiopian economy as well as financial activities that had undertaken countrywide.  In terms of time, it covers the time period 1975–2016.

The study added value to the previous studies in Ethiopia by using more recent data, controlling for other factors that affect growth and Finance used a methodology of the ARDL bounds test for co-integration. The study will distinguish between long-run and short- run causality. This is because the effects of high financial development and economic growth can be realized in the short-run but in the long run they may disappear (Darrat, 1999).

## 1.7 Limitation of the Study

Every study conducted may have certain shortcomings. When conducted a preliminary search for data there were occurred some constraints that affect the research work. The major constraint of the problem involves the data availability was not assessed quarterly data, that gave a better data points for the study, was not observe since it is inexistent. Whatever the case the available data points were able to portray the reality.

## 1.8 Organization of the Paper

This paper is organized into five chapters. Following the introduction part, chapter two presents the review of related theoretical and empirical literature regarding financial development and economic growth. Chapter three gives insight on the model specification, methodology employed and data source. Chapter four provide the data analysis and discussion by using ARDL model in order to compute the result author used E view 9. At last, chapter five come with conclusions and recommendations followed by references and appendix Tables.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Theoretical Literature

The nexus between financial development and economic growth given much consideration in development economics literature, According to King and Levine (1993) found that all deputation of financial development gave positive signs and statistically significant on growth in eighty countries from period 1960-1989. Rajan and Zingales (1998) studied a multiple regressions model using data from the Industries Statistics Year Book for 1993. They found that financial development influenced directly to the economic growth. Another, studies by Kar and Pentecost (2000), with using granger causality, co-integration and VECM to examine the causality among financial development and economic growth in Turkey during 1963 to 1995. The result designated that the causality was come from economic growth to financial development, thus economic growth lends strength to the financial sector in Turkey. Furthermore, ten developing countries were also becoming the subject empirical study done by Christopoulos and Tsionas (2004) through which they target to examine financial depth and economic growth for long run by employing the analysis of panel co-integration. They found that there is long run relationship between growth, subsidiary variable and financial depth. Meanwhile, the causality found from financial depth to economic growth. On the other hand, Al-Tammam (2005) found that there is co-integration between financial development and economic growth in Oman, Saudi Arabia and Kuwait. Meanwhile, the causality runs from economic growth lead financial development in all countries for long run and the causality runs from financial development to economic growth only for Saudi Arabia and Oman in the short run.

Furthermore, Odhiambo (2008) investigated the causality between finance and economic growth in Kenya during 1969-2005 periods. It employed the dynamic multivariate Granger causality test and error correction model. He found that there was only one way causality from economic to finance. The finding indicated that finance act minor role in contribution to economic growth. By using the same method to analyze in 2011, he found the same result that economic growth leads financial development in South Africa for 1960-2006 period. Therefore, he concluded that the hypothesis of financial development causes economic growth did not hold in South Africa for the period of analysis. Gries, Kraft, and Meierrieks (2009) conducted the Hsiao Granger method, the

Vector Auto-Regression (VAR), and the Vector Error Correction Model (VECM) for the purpose causal relationship between financial deepening, trade openness and economic growth in 16 Sub-Saharan African countries. The results show to support the hypothesis that finance lead to economic growth. By using panel co-integration test, dynamic OLS and panel VECM approach, Bangake and Eggoh (2011) reported that there existed bi-directional causality among financial development and economic growth in 71 countries including 18 developing countries from 1960 to 2004. On the other hand, Kar, Nazliogu, and Agir (2011), focused on the Middle East and North Africa (MENA) countries for the period of 1980 to 2007. They used a simple linear model. They also found that there is two-way directional relationship between financial development indicator specific and economic growth.

Shittu (2012) examined the impact of financial intermediation on economic growth in Nigeria from 1970 to 2010. For the analysis, the unit root test and co-integration test were done accordingly and VECM was estimated using Engle-granger technique. The findings revealed that financial intermediation has a significant impact on economic growth in Nigeria. Musamali, Nyamongo, and Moyi (2014) examined the relationship between financial development and economic growth from 50 African countries for period 1980-2008. The result found that there was a positive relationship between financial development and economic growth. However, the link on domestic credit to private sector and economic growth was much stronger than that of the broad money and economic growth. In addition, there was bi-directional link between financial sector and economic growth.   Altaee and Al-Jafari (2015) investigated the relationship between trade openness, financial development and economic growth in Bahrain from 1980-2012. The VECM model in combination with VDC and IRFs analysis were utilized to explore the causality among variables. The findings show that trade openness and financial development lead economic growth. Thus, Bahrain should to push forward the improvement of financial sector and enhance trade openness to achieve the sustainable of greater and higher economic growth. Ndako (2017) found that financial development, investment and economic growth have long run relationship in Nigeria from 1960 until 2014 by conducted VAR framework of Johansen. The results also shown that investment is a critical factor through which financial development impacts on economic growth. Al-Qudah (2017) investigated the correlation between financial development and economic growth in Jordan by using quarterly data for the period 1993:Q1 to 2014:Q2. He found that financial development has a positive influence and significantly on

economic growth in long run as well as there is bi-directional causality among that variable. On the other hand, by using VAR model Jung (2017) found that real GDP per capital, financial development, real exports and real imports are co-integrated with one vector. It also shown support of supply leading view from financial development to economic growth in Korea from 1961 to 2013. By using VECM model, Ono (2017) examined the finance-growth nexus in Russia. The period divided with two, first from 1999 through 2008 and second from 2009 through 2014. The findings revealed that economic growth granger cause money supply and bank lending following from 1999 to 2008. Meanwhile, the causality only runs from economic growth to bank lending for 2009 to 2014. By using ARDL approach Inheanacho (2016), found that insignificantly negative in the long run and significantly negative in the short run in Nigeria over the period 1981-2011. Similar study was conducted by Puatwoe and Piabuo (2017) found that in short run, broad money, government expenditure and economic growth have positive relationship. Meanwhile, all indicators show positive impact and significantly on economic growth in Camerron from 1980-2014. In addition, Ofori-Abebrese, Pickson and Diabah (2017) also applied ARDL approach and granger causality in Ghana during the period 1970-2013. The findings indicated that the credit from domestic to private sector has positive impact and statistically significant on the economic growth. It also found the causality from the economic growth to domestic deposit. In addition, Okpara et al., (2018) investigated relationship between financial development and economic growth in Nigeria from 1981 until 2014. By employed co-integration and VECM, it found that financial development and economic growth have long run relationship. Besides that, it also found bi-directional causality between capital market and economic growth, while market capitalization ratio, broad money and the rate system banking of financing the economy drive the economic growth with no feedback effect.

Murcy et al. (2015) examine the relationship between financial development and economic growth in Kenya using annual time series data. They employed autoregressive distributed lag (ARDL) so as to accommodate small sample data series and to address the problem of endogeneity and found that financial development has a positive and statistically significant effect on economic growth in Kenya in long-run and short-run hence confirmed supply leading hypothesis. In case of Ethiopia, few studies such as Roman (2012) investigates the link between the financial development and economic growth by using ECM Model and found that the existence of an uni-directional causality from economic growth to financial development and the

presence of the positive and significant long-run relationship between financial development and economic growth and an insignificant effect in the short-run which implies controversies result toward the financial development and economic growth relationship in line with other studies in the same area. On another hand, Murty et al. (2012) investigates the long-run impact of bank credit on economic growth in Ethiopia via a multivariate Johansen (1988) co-integration approach using time series data for the period 1971/72-2010/11. Their focus of the investigation was transmission mechanism through which bank credit to the private sector affects economic growth and found that a positive and statistically significant equilibrium relationship between bank credit and economic growth in Ethiopia. Moreover, they also come up with results that deposit liabilities affect long-run economic growth positively and significantly through banks services of resource mobilization. Basically, their finding shows that bank credit to the private sector affects economic growth through its role in the efficient allocation of resources.

Fozia (2014) tried to investigate the effect of the financial sector on the economic growth of Ethiopia over the period of 1980-2013 by employing ordinary least square method to determine both long-run and short-run effects of financial development on economic growth. An indicator of financial development used by the researcher was commercial-central bank asset ratio whereas variables such as openness lagged real GDP, total investment, aid, and labor force were used as conditioning variables. She found a negative and significant effect of financial development indicator (i.e. commercial-central bank asset ratio) on the economic growth of Ethiopia. In addition, regarding control variables she used indicated that trade openness and labor force had an expansionary effect on the economic growth whereas aid showed a significantly negative effect on the economic growth. Furthermore, the current study was done by Bekana (2016) who undertaken empirical investigation of the relationship between financial development and economic growth by using VAR approach and Johnson co integration, and found that financial development has negative coefficient and insignificant effect in the long-run, but significant relation in the short-run which is conflicting results with the Roman (2012) finding. The studies implied in Ethiopia context are come up with the different result which is difficult to draw a relevant conclusion on the relation between financial development and economic growth.

## 2.2 Theories of Financial Development

There are many theoretical literatures about the link between financial development and economic growth. The debate of whether the causal relationship runs from financial development to economic growth on the one hand and economic growth to financial development is far from settled. The traditional neo-classical literature on growth suggests that financing is not important. They emphasized that if the financial system is to play a role it can be through its effects on factor accumulation or on innovation. Bloch and Tang (2003) revealed that Schumpeter was among the first to point out that banks facilitate technological innovation in their role of financial intermediaries.

The Schumpeterian view is that the development of financial intermediaries has a direct impact on the pace of technical change and productivity growth, which leads to overall output growth (Bloch and Tang, 2003). While Robinson (1952) and Lucas (1988) argued that financial development primarily follows economic growth event conclusion on the relation between financial development and economic growth Mackinnon (1973) and Shaw (1973) emphasized the role of capital accumulation in economic growth. They further implied that economic growth can be increased by removing institutional interest rate ceilings and reserve requirement tax and ensuring that the financial system operates competitively under conditions of free entry. In general, the Mckinnon-Shaw model shows that financial repression reduces both the quality and quantity of investment in the economy.The structural economists such as Taylor (1983), Van Wijnbergen (1983) and Buffie (1984), in contrast to Mckinnon and Shaw's view argued that financial development decreases total real credit supply and thereby preventing economic growth.

Financial intermediary development increases capital accumulation and reduces the costs of external finance to firms, leading to overall economic growth (Bolch and Tang, 2003).Bencivenga and Smith (1991) also show that the development of banks increase economic growth by channelling savings to a productive activity which is consistent with the view of Schumpeter. In addition, they illustrated that even if aggregate saving is reduced, economic growth can occur because financial development has a significant impact on the efficiency of investments.

Roubini and Sala-i-Martin (1992) developed a model that shows financial repression reduces the productivity of capital and lowers savings, which hampers growth. They further built a model that examined the effects of policies of repression of the financial system in the form of taxes, restrictions and regulations of various sorts, on the rate of economic growth.

They asked the question why an optimizing government represses the financial sector in spite of the fact that it reduces economic growth their justification was that government stays in the way of private financial evolution because the financial sector is the potential source of "easy" resources for the public budget. One of the implications of the study was that countries that are financially repressed will have higher inflation rates, lower real interest rates, higher base money per capital and lower per capita growth than countries that are financially developed.

The model developed by Greenwood and Jovanovich (1990) shows that growth provided a means to develop the financial sector while the financial sector in turn allowed for higher growth through investment. Both the financial intermediation and the rate of growth are endogenously determined. In line with this argument, Blackburn and Hung (1998) also focused on the positive, tow-way causal relationship between growth and financial development. Some models emphasize the role of banks for the development of financial system while others stress on the potential benefits of security markets. Arestiset al. (2005) suggested three theories to examine the link between financial development and economic growth: the bank-based theory, the market-based theory and the financial services.

The bank-based theory argues that banks can promote economic growth by allocating resources in an efficient manner (Arestis et al., 2005). The study of Gerschenkron (1962) cited by Levine (2004), indicated that bank-based financial systems are better than the market-based system because the latter reveals information publicly, thereby reducing incentives for investors to seek and acquire information. Banks however can form long-run relationship with firms by privatizing the information they acquire (Levine, 2004). The market-based theory on the other hand stresses the advantage of better performing markets. These markets are believed to provide a richer set of risk management tools that permit greater customization of risk ameliorating instruments (Levine, 2004).

The third theory, financial services, argues that the issue is not the source of finance rather the creation of an environment where financial services are efficiently provided. It is neither banks

nor markets that matter; it is both banks and markets Arestis et al. (2005). Levine (1997) also argued that the choice is not either banks or markets; rather, banks and markets provide financial services to the economy.

On the other hand, to address the issue of causality between financial development and economic growth, Patrick (1966) developed the supply-leading and demand-following hypothesis. The supply-leading hypothesis argues a causal relationship from financial development to economic growth which means that the creation of financial institutions and markets increase the supply of financial services and thus leads to real economic growth. Among the researchers who agreed with this hypothesis are King and Levine (1993), Greenwood and Jovanovic (1990), Demirguc-Kunt and Levine (2008), Calderon and Liu (2003) and Christopoulos and from economic Tsionas (2004).

The demand-following hypothesis however postulates a causal relationship growth to financial development that is an increasing demand for financial services might lead to an expansion in the financial sector as the economy grows (Patrick, 1966). Robinson (1952), and Lucas (1988) both believed that economic growth is a causal factor for financial development.

## 2.3 Empirical Literature

Unlike the mixed views manifested in the theoretical literature, finance and growth impact empirical investigation tended to look at financial development in a more positive light cross-country analysis as well as countries specific studies conducted by different scholars though some studies are confirmed the insignificant or negative impact of financial development on growth. However, other than impact assessment, the contemporary issue that has been emerged in empirical work is the direction of causality between financial development and economic growth which are categorized as supply leading response or school of thought, demand following a school of thought and bidirectional school of thought (Adusei, 2014).

A different study conducted regarding causality between financial development and economic growth in which whether the causality is supporting demand following or supply leading hypothesis or bidirectional. There is no conclusive result found. For example, in chronological order the studies done by McKinnon (1973), King and Levine (1993), Levine et al. (2000), Majid and Mahrizal(2007), Odhiambo (2007), Quartey and Prah (2008), Bittencourt(2012)and

Shahbaz(2013) are strongly confirmed the 'supply-leading' hypothesis in their empirical investigation. They found that the unidirectional causation running from finance to economic growth. In their finding, a country is being enjoyed sustainable growth when there is developed financial sector matter. Contrary to above argument, some of scholars such as Gurley and Shaw(1967), Goldsmith (1969), Levine(2005), Liang & Teng (2006), Odhiambo (2007), Ang (2008); Demirgüç-Kunt and Levine (2008), Odhiambo (2010) and Rafindadi and Yusof (2013)found the 'demand following finance hypothesis' in their empirical work which argues that economic growth comes first to accelerate financial development than otherwise.

The third category of direction of causality between the variable is bi-directional school of thought as empirically evidenced by different scholars such as Greenwood and Smith(1997); Blackburn and Hung (1998); Majid(2007); Rousseau and Vuthipadadorn (2005); Jenkins and Katircioglu(2010) and Kyophilavong et al. (2016)who submits in their empirical work that there is the bidirectional relationship exists.

Contrary to aforementioned three schools of thought with regard to the direction of causality, some other empirical work confirmed that there is no causality between financial development and growth. Such study has conducted by De Gregorio & Guidotti (1995) and Gries et al. (2009) as well. According to them, neither financial development nor economic growth are endogenously determined.

## 2.4 Country- Specific Studies of Finance and Economic Growth Evidence

There has also been a movement away from applying time-series methods to a variety of countries and toward examining individual countries, which allows research to design country-specific measures of financial development. Accordingly, Nkoro and Uko(2013) examined the financial sector development-economic growth nexus in Nigeria. They employed Error Correction Mechanism (ECM) with an annual dataset covering the period, 1980-2009. They also used five different indictors used to measure financial development. The empirical results show that there is a positive effect of financial sector development on economic growth in Nigeria. However, credits to the private sector and financial sector depth were found to be ineffective and fail to accelerate growth. However, this study did not address the problem of endogeneity which is a problem in time series studies since the relationship between financial development and economic growth cannot be determined on a priori grounds.

Karbo and Adamu (2011) cited in Murcy et al.(2015) analyzed the nexus between financial development and economic growth in Sierra Leone over the period 1970-2008 autoregressive distributed Lag (ARDL) model, the results revealed that financial development exerts a positive and statistically significant effect on economic growth and investment is an important channel through which financial development feeds on economic growth. A similar conclusion has been drawn early by Sanusi & Sallah(2007) that they investigated the relationship between financial development and economic growth in Malaysia data ranging from the period 1960 to 2002 using autoregressive distributed lag (ADL) and took different financial development pointer to compare their significance on growth. Finally, they come up with a positive and statistically significant impact on economic growth in the long-run when only ratio of broad money to GDP and bank credit used as indictor. Moreover, they found that a rise in investment will stimulate economic growth in the long-run.

## 2.5 The Financial Development and Economic Growth Evidence in Ethiopia Context

The empirical studies have been undertaken in Ethiopia primarily on the relationship between financial development and economic growth at the aggregate level. Among empirical studies, Haile and Kassahun(2011) investigated the link between financial development and economic growth using data of Ethiopia from 1972-2010 and finally found a positive link between the two. But, they did not say anything about the causality between financial development and GDP growth.

Other study by Roman (2012) investigated the link between the financial development and economic growth by using ECM Model and found that the existence of a uni-directional causality from economic growth to financial development and the presence of positive and significant long-run relationship between financial development and economic growth and an insignificant effect in the short-run which implies controversies result toward the financial development and economic growth relationship in line with other studies in the same area. On another hand, Murty et al.(2012) investigated the long-run impact of bank credit on economic growth in Ethiopia via a multivariate Johansen co-integration approach using time series data for the period 1971/72-2010/11.Their focus of the investigation was transmission mechanism through which bank credit to the private sector affects economic growth and found that a positive and statistically significant equilibrium relationship between bank credit and economic growth in

Ethiopia. Moreover, they also come up with results that deposit liabilities affect long-run economic growth positively and significantly through banks services of resource mobilization. Basically, their finding shows that bank credit to the private sector affects economic growth through its role in the efficient allocation of resources.

In the same manner, Melkamu, (2015) conducted the impact of commercial banks development on economic growth by using ordinary least square(OLS) method and found that a positive and significant relationship among economic growth, deposit and loan and advances whereas negative and significant association ship between economic growth and bank size i.e. asset.

Fozia, (2014), tried to investigate the effect of the financial sector on the economic growth of Ethiopia over the period of 1980-2013 by employing ordinary least square method to determine both long-run and short-run effects of financial development on economic growth. An indicator of financial development used by the researcher was commercial-central bank asset ratio whereas variables such as openness lagged real GDP, total investment, aid, and labor force were used as conditioning variables. She found a negative and significant effect of financial development indicator (i.e. commercial-central bank asset ratio) on the economic growth of Ethiopia. In addition, regarding control variables she used indicated that trade openness and labor force had an expansionary effect on the economic growth whereas aid showed a significantly negative effect on the economic growth.

Furthermore, the current study was done by Dejene(2016) who undertaken empirical investigation of the relationship between financial development and economic growth by using VAR approach and Johnson cointegration, and found that financial development has negative coefficient and insignificant effect in the long run but significant relation in the short run which is conflicting results with the Roman(2012) finding.

On the other hand, studies revealed that economic growth can stimulate the development of financial intermediation. Empirical literature on finance and growth includes cross country growth regression, time-series analysis, panel studies, industry and firm level studies which are discussed as follows.

### 2.5.1   Cross- Country Evidence

Cross-country regressions have been used to examine a variety of macroeconomic relationships, including the one between financial development and long-run growth. This approach involves averaging out variables over long time periods (typically three decades) and using them in cross-section regressions aiming at explaining cross-country variations of growth rates (Arestis & Demetriades, 1997).

Goldsmith (1996) cited in Levine (2004) used data on 35 countries for the period 1860-1963 on the value of financial intermediary assets as a share of economic output and found out that the size of the financial intermediary sector is positively correlated with the quality of the services provided by the financial sector The major downside of his study noted by Levine (2004) is that financial development indicator may not accurately proxy for the functioning of the financial system. The study also fails to identify the direction of causality and furthermore the data set was limited to only 35 countries (Levine, 2004).King and Levine (1993) studied 77 countries over the period 1960-1989. They examined the depth, which is the measure of the size of financial intermediaries, the variable bank, which measures the relative degree to which the central bank and commercial bank allocate credit and finally credit to the private sector. In addition they examined 3 growth indicators, (1) real per capita GDP growth (2) growth in capital stock per person and (3) total productivity growth. They came to the conclusion that all 3 financial development indicators have a strong positive relationship with economic growth. But their finding is not without limitations. It doesn't deal with the issue of causality and only concentrates on a bank-based system. Using the data of King and Levine (1993), Arestis and Demetriades (1997) argue that the contemporaneous correlation between the main financial indicator and economic grow this much stronger than the correlation between lagged financial development and economic growth.

Levine and Zervos (1998) added stock market and used the data of 42 countries for the period 1976-1993 and built different measures of stock market development to find out the relationship between stock market development and growth. They found out the initial levels of stock market liquidity and banking development are positively and significantly correlated with future rates of economic growth, capital accumulation and productivity growth. Like the works of King and Levine (1993), the works of Levine and Zervos (1998) does not deal with the issues of causality.

They also exclude other components of financial sector like bond markets. sKhan and Senhadji (2000) studied the relationship between financial development and economic growth using 159 countries (Industrial and Developing) from the period 1960-1999. They estimated the growth equation using both cross-section sample and five-year average panels. Cross-section is used in order to smooth out short-term fluctuation in the growth rate of real GDP and focus on the long-run growth rate of a country. But this method leaves out some important features of the growth path of the economy. That is why their study included five-year-average panels. The result of their work confirms a strong positive and statistically significant relationship between financial depth and growth in the cross-section analysis. However, some financial depth indicators become statistically insignificant when the growth

Equations are estimated with panels. Cross-country variations in results are difficult to interpret (Quah, 1993). It fails to distinguish between statistical association and causation and in addition it fails to address the country-specific effects of financial development on economic growth and vice-versa because it groups together countries that are at different economic stages. It can only refer to the 'average effect' of a variable across countries (Arestis and Demetriades 1997)

### 2.5.2 Time-Series Evidence

To examine the finance-growth relationship, time-series econometric applications which use the granger causality test and vector autoregressive (VAR) procedures are usually undertaken. HaileKibret & Kassahun (2011) used data of Ethiopia from 1971-2010 and studied the link between financial development and economic growth. They applied the Stock Watson Dynamic OLS method using liquid liabilities of commercial banks to GDP ratio as a financial development indicator. Their findings suggest that    and economic growths have a positive linkage and the granger causality test result shows a bi-directional causality between the two.
Rahman (2004) uses the data of Bangladesh from 1976-2005 based on long-run structural vector auto regressions (SVAR) model and investigates the finance-growth nexus. The study concluded that financial development has long-run impact on investment and income per capita. Furthermore, Arestis and Luintel (2005), utilized time-series data and methods along with dynamic heterogeneous panel approach on developing countries. They employed multivariate vector auto regression for the time-series data's and found that for the majority of sample countries, financial structure significantly explains economic growth. The results from

heterogeneous panel also stress the importance of financial structure. Arestis and Luintel] (2005) provided evidence that panel estimates do not appear to correspond to country specific estimates and may provide deceptive results.

Arestis and Demetriades (1997) used data for 12 countries and found out the casual link between finance and growth is determined by the nature and operation of the financial institutions and policies pursued in each country which is consistent with the works of Demetriades and Hussein (1996) who carried out a time-series analysis and concluded that causality patterns vary across countries. Empirical work on causality between financial development and economic growth is scarce because of insufficient long time series data especially for developing countries. Jung (1986) investigated quantitative evidence on the causality between financial and real development using annual data for 56 developed and developing countries. But his results were inconclusive because they varied according to the financial development indicator and the development level of the countries under consideration. Abu-Bader and Abu-Qarn (2005) examined the causal relation between finance and growth from a time series perspective for Egypt. They applied co-integration test and error correction models and revealed both direct causality from financial development to economic growth and indirect causality from financial development to real GDP per capita through investment.

They concluded that relaxing financial constraints and deepening the financial sector are essential to boost economic development through either increasing investment resource or enhancing investment efficiency. Guryay et al.(2007) on the other hand examined the relationship between financial development and economic growth in Northern Cyprus from 1976-2004 using ordinary least square (OLS) method and showed that there is negligible positive relationship between financial development and economic growth. Rousseau and Sylla (2000) investigated the hypothesis that U.S economic growth and development were "finance–led". They used a set of multivariate time-series model that relate measures of banking and equity market activity to investment, imports and business incorporation over the 1790-1850 period. Examining an individual country, that is U.S, Rousseau and Sylla (2000) were able to design country specific measures of financial development and expand the time-series dimensions of the analysis. They concluded that improving the financial system will foster sustainable economic growth. Bloch and Tang (2003), using time-series data for individual 75 countries over the period 1960-90 tested the relationship between financial development and economic growth.

They calculated the correlation coefficients between private credit to GDP and GDP growth and found out that of 75 countries, 26 showed a positive correlation and the remaining 49 showed a negative correlation. They also emphasized the weak association over time between financial development and economic growth is not sensitive to a change in the indicator of financial development. In addition their study made a distinction between cross-country and time-series approaches such that: (1) cross-country approach involves taking averages of the key variables over lengthy periods, which ignore the evolution of the key variables and how they interact overtime (2) cross-country approach makes the simplistic assumption that each economy has a stable growth path (3) cross-country approach gives all countries an equal weighting since they are assumed to be homogeneous (4) this approach might suffer from sample selection bias (5) and it represents only an average relationship (Bloch and Tang, 2003).

Time-series models are able to overcome such difficulties. Unlike the cross-country panel regressions discussed earlier, this concept therefore does not control for omitted variable bias by directly including other variables or by controlling with instrumental variables rather, by including a rich lag structure, which is lacking in the cross-sectional approach, the time-series approach hopes to capture omitted variables (Beck, 2011).

### 2.5.3 Panel Evidence

It is quite possible to expect a combined influence of cross-sectional and time series changes together and their combined impact on economic growth. In other words, the explanation of financial development and economic growth nexus can be explained better with a combination of cross-section and time series analysis, than doing so individually. Such empirical analysis is referred as 'Panel Data Analysis' (Acharya et al., 2009). As variables under investigation are to be examined in both cross-sectional as well as time series dimensions, it takes care of all possible changes in the economy, resulting in controlling omitted variable bias (Acharya et al., 2009). Acharya et al., (2009) employed the panel data analysis based on a theoretical foundation that takes care-of the combined influence of cross-sectional and time-series specifications in empirical testing for 14 Indian states for the period 1981-2002. The study found out that financial development is considered to be a lead variable in economic growth in Indian states. Technique avoids biases associated with cross country regressions and it allows the use of instrumental variables for all regressors and thereby providing more precise estimates of the finance-growth relationship. Using private credit as a measure of financial development they found out a

positive relationship between the exogenous component of financial development and economic growth, productivity growth and capital accumulation. Rioja and Valev (2003) closely followed the works of Beck et al., (2000) in estimating the effects of financial development on the sources of economic growth. They used data sets of 74 countries over the period 1961-1995 and applied the GMM dynamic panel technique. Their results are consistent with previous empirical work which finds that the effects of finance on economic growth may vary in different types of countries. Their findings further shows that finance promotes growth through productivity growth in developed countries while for developing countries, finance encourages growth through capital accumulation. Rioja and Valev (2003) also found that the impact may be nonlinear.

On the other hand, Jude (2010) emphasized that the nonlinear relationship can depend on economic policy variables, such as inflation rate and the government expenditure as ratio to GDP or structural variables like the degree of openness to trade and the financial development level. This study covered the period 1960-2004 and focused on a sample of 71 countries both developed and developing. The measurement was based on a panel smooth threshold regression specification and the study concluded that the non-linearity between finance and growth can be found by economic development variables as well as financial development indicators. Christopoulos and Tsionas (2004) used panel co-integration analysis to examine whether a long run relationship between financial development and economic growth exist for 10 developing countries over the period 1970-2000. Using fully modified ordinary least square (OLS) estimation technique they had strong evidence in favour of the hypothesis that long run causality runs from financial development to economic growth, which is unidirectional causality from financial depth to growth. However their study was limited only to a few developing countries. Apergis et al., (2007) expanded their data set and examined whether a long run relationship between financial development and economic growth exists employing panel integration and co-integration technique for dynamic heterogeneous panel of 15 OECD and 50 non-OECD countries over the period 1975-2000.Their result supported a positive and statistically significant equilibrium relation between financial development and economic growth for all different financial indicators used. Unlike the study of Christopoulos and Tsionas (2004), their result indicated a strong bi-directional causality between financial development and economic growth.

Furthermore, policies that foster macroeconomic stability, increased openness, investment in physical and  human capital and  productive government spending that improve economic growth also have an important effect on financial development in the long run.Using a different approach, Calderon and Lui (2003) employed the Geweke decomposition test on pooled data of 109 developing and industrial countries from 1960 to  1994  to  examine  the  direction  of causality  between  financial  development  and economic growth.  Their study used the ratio of broad money (M2) to GDP and the ratio of private sector credit to GDP as a measure of financial development. They decomposed the association between financial intermediation and growth into 3 different causal relationships: (1) causality from growth to financial development, (2) causality from financial development to growth and (3) instantaneous causality between financial development and economic growth. Their results are as follows:

1. Financial development leads to economic growth, that is, financial deepening in many countries resulted in a prosperous economy

2. The Granger causality from financial development to economic growth and the Granger causality from economic growth to financial development coexist

3. Financial deepening contributes more to the causal relationship in the developing countries than in the industrial countries, which means that developing countries have more room for financial and economic development

4. The effects of financial development on economic growth are more seen on a longer sampling interval, which means it takes time for financial deepening to affect the economy.

5. Financial development enhances growth through capital accumulation and technological change.

The important policy implications put forward by Calderon and Lui (2003) is first, in order to have a sustainable economic growth, financial reforms must be undertaken and second liberalizing the financial sector, especially for developing countries is an advantage to promote economic growth.

### 2.5.4 Industry-Level analysis

Under this analysis the main issue is whether industries grow faster in economies with better developed financial system. Rajan and Zingales (1998) studied 36 industries in 42 countries for the period 1980-90 and tested whether industrial sectors that are relatively more in need of external finance develope disproportionately faster in countries with more developed financial

markets. It is argued that financial markets and institutions help a firm overcome problems of moral hazard and adverse selection, thus reducing the firm's cost of raising money from outsiders.

Rajan and Zingales (1998) identified an industry's need for external finance from data on U.S and used the ratio of domestic credit and stock market capitalization to GDP as a measure of financial development. Their results concluded that industries that are naturally heavy users of external finance should benefit more from greater financial development than industries that are not.

Wurgler (2000) used industry level data for 65-countries, 28 manufacturing industry and 33 year panel of gross capital formation and value added for the period 1963-95. The result was that countries with high level of financial development, as measured by the size of the domestic stock and credit markets relative to GDP, increase investment in growing industries and decrease investment more in declining industries.

As cited by Levine (2004), scholars like Beck, Demirguc-Kunt, Laeven and Levine (2004) extended the works of Rajan and Zingales (1998) and examined whether industries that are naturally composed of small firms grow faster in financially developed economies. By comparing across countries and industries , they showed that industries that are composed of smaller firms do infact grow faster in countries with better developed financial system.

Fishman and Love (2003) analyzed the relationship between financial development and inter-industry resource allocation in the short and long run. They emphasized that in the short-run, financial development facilitates the reallocation of resources to industries with good growth opportunities. In the long-run, economies with high rates of financial development will devote relatively more resources to industries that rely on outside finance due to a comparative advantage in these industries.

In order to test this hypothesis, they developed a proxy for industry-country growth shocks based on the works of Rajan and Zingales (1998). They found different effects of these measures on industry growth and composition in countries with different levels of financial development.

### 2.5.5 Firm Level Analysis

Firm level studies were conducted by Guiso, Sapienza and Zingales (2002). Rather than studying the effect of financial development across countries, they studied the effect of local financial development within a single country, i.e, Italy. They criticized the use of financial development

measures such as stock market capitalization to GDP or stock market turnover to GDP at the local level. They constructed a new indicator of financial development by estimating a regional effect on the probability that, ceteris paribus, a house hold is shut off from the credit market. By using this indicator they found that financial development enhances the probability an individual starts his own business, favors entry, increases competition and promotes growth of firms. All in all, their evidence suggest that local financial development plays a significant role even in a perfectly integrated markets.

Demirguc-Kunt and Maksimovic (1998) tested whether greater financial development removes impediments to the exploitation of profitable growth opportunities or not. Unlike Rajan and Zingales (1998), who focused on the need of external financing of an industry, Demirguc-Kunt and Maksimovic (1998) estimated the external financing needs of each individual firm of 26 countries for the period 1980-91.They concluded that both banking system development and stock market liquidity are positively associated with the excess growth of firms and in addition noted that the size of the stock market is not relevant for a firm's growth.
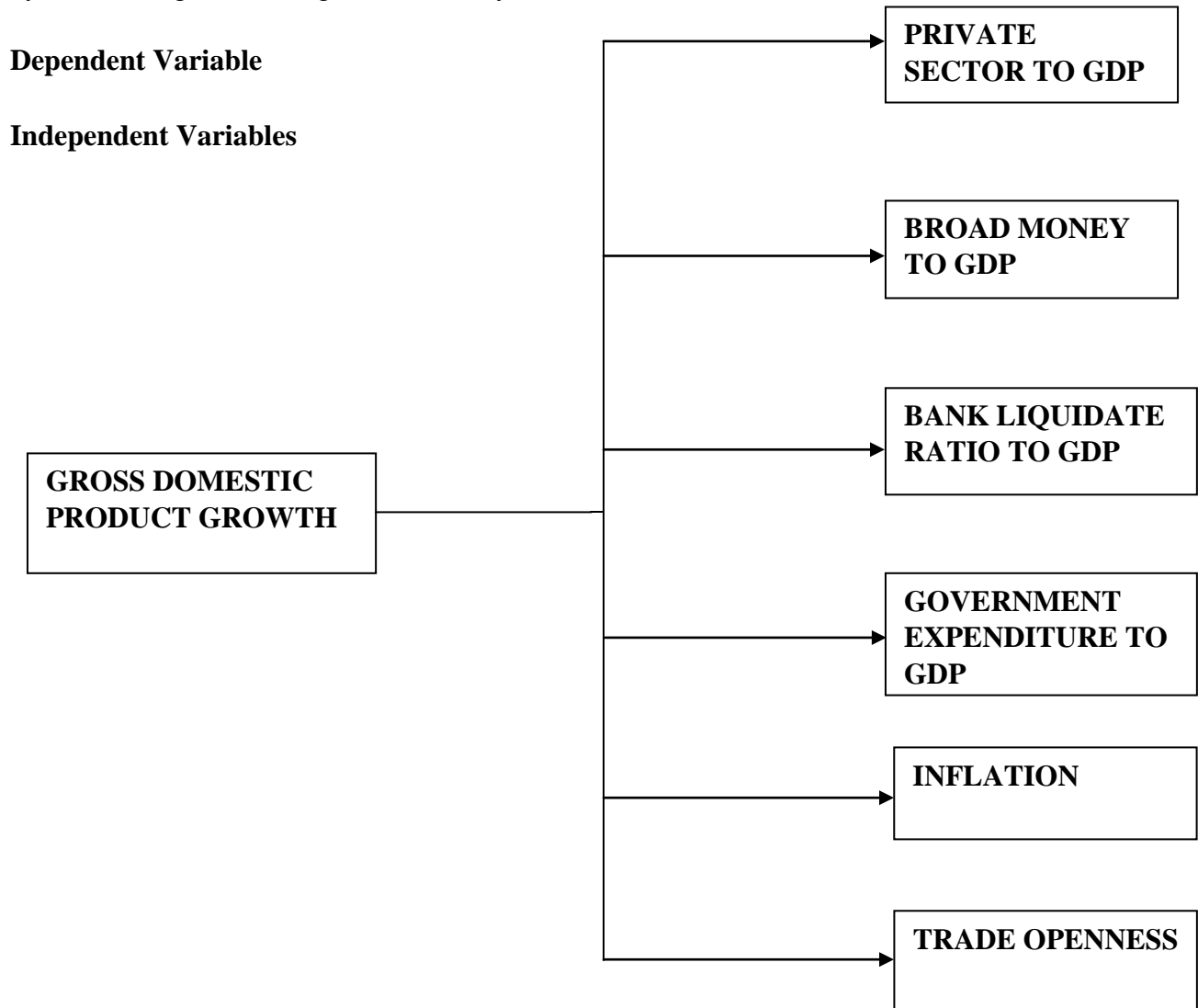
Love (2003) also found that the sensitivity of investment to internal funds is greater in countries with poorly developed financial system. Financial development is particularly effective at easing the constraints of small firms. Beck, Demirguc-Kunt and Maksimovic (2005) use a different data set and show that financial development weakens the impact of various barriers to firm growth and that small firms benefit the most from financial development. Benfratello et al., (2006) on the other hand investigated the effects of local banking development on firms' innovative activities using firm level data for a large number of Italian firms over the 1990's. Their results indicated that banking development affects the probability of process innovation for firms that depend on external finance. This development reduces the cash flow sensitivity of fixed investment spending for small firms and increases the probability they will engage in R&D. In general, firm level studies indicate that financial development removes barriers to firm expansion and exerts a particularly beneficial impact on small firms.

To summarize, empirical evidence on financial development and economic growth yield different result from one study to another. This is believed to be mainly due to the methodology employed, the development level of the countries under consideration or the financial development indicator used in the study.

## 2.6. Conceptual Framework

The conceptual frame work in figure 1 indicate that, Economic Growth is represented by GDP growth rate which is a dependent variable and Measure of financial sophistication like credit to private sector to GDP ratio and Broad Money to GDP ratio and other variables like bank liquidate ratio, Government expenditure, Inflation and Trade openness are listed as independent variable.

According to different studies carried out, the impact of financial sector is more significant and positive to the developing countries compared to developed countries. Our Economy is categorized under emerging Economies. Financial sector should promote Economic development by accelerating economic growth as catalyst.

**Dependent Variable**

**Independent Variables**

| | |
|---|---|
| | **PRIVATE SECTOR TO GDP** |
| | **BROAD MONEY TO GDP** |
| | **BANK LIQUIDATE RATIO TO GDP** |
| **GROSS DOMESTIC PRODUCT GROWTH** | **GOVERNMENT EXPENDITURE TO GDP** |
| | **INFLATION** |
| | **TRADE OPENNESS** |

**Figure 1. Self-constructed conceptual Framework**

# CHAPTER THREE

## DATA SOURCE AND RESEARCH METHODOLOGY

### 3.1 Nature and Source of Data

In order to capture the relationship between financial development and economic growth the study used the ratio of Private Credit to GDP as an indicator of financial development since the other indicators such as broad money consists of currency in circulation and bank deposit which is mostly a monetary phenomenon dealing with central bank issues. Following the works of Roubini & Salai-Martin (1992), King and Levine (1993), the study use Gross Domestic Product as a proxy for economic growth.

This study conducts the empirical analysis by employing data sets for the period 1975-2016 for all the variables specified in the model. This period is chosen based on the availability of full figures. Data of real GDP, Money Supply, Bank Liquidity Ratio, Inflation, Government Expenditure over Trade openness and private credit sector are all obtained the from National Bank of Ethiopia.

### 3.2 Model Specification

There are several indicators of financial development that have been proposed in the literature. Likewise several studies have used various proxies for financial development. It is clear that from the definition of financial development, there is no single indicator which can measure Financial development of a country so, this paper study variables below listed and to be assessed The empirical linkage between financial development and economic growth is adapted from a simple model developed by De Gregorio and Guidotti (1995) and Abduroluman (2003). In this model the financial development variables is comprised in an endogenous growth model. The model shows how indicators of financial development through economic relationships turn to have an influence on economic growth. The equation below shows the functional and econometric relationship between the variables of the study.

**Function of production as :**

Economic growth=f (financial development, macro−economic environment)

RGDP = F (PC, MS, LR, INF, GE, TO) and when the equations established is as follows:

$$LGDPt = \alpha + \beta 1LPCt + \beta 2LMSt + \beta 3LBLRt + \beta 4IGEt + \beta 5INFt + \beta 6TOt + \varepsilon_t \text{-------------------- 3.1}$$

1. Where α = constant, $\varepsilon_t$ = error term, while $\beta_1, \beta_2, \beta_4, \beta_5, \beta 6$ are coefficients.

(2) Where GDP is gross domestic product, MS is money supply, LR is bank liquidity ratio, PC private sector credit as % of GDP, GE is government expenditure as % of GDP and INF is inflation proxy by consumer price index and TO is trade openness measured by import plus export divided by GDP and ε is error term.

## 3.3 Econometric Procedure

### 3.3.1. Estimation Procedure

As long as testing the long run relationship and causality between the dependent variable (real GDP) and independent variables (money supply, liquidity bank ratio, private sector credit, inflation, and government consumption and trade openness) are concerned, the study applied Autoregressive Distributed Lag (ARDL) Model. The first task in this study will investigate the time series properties of our data by using Augmented Dickey-Fuller (ADF) and Philip-Perron (PP) tests. This mean that the unit root tests were used to check the stationary of the variables and to check none of the variables are not greater than order one (i.e. I (1)), as well as none of the dependent variables, were stationary at level which is precondition to applying ARDL model (Pesaran et al., 2001).Better to start from the stationarity test as it is a priori with time-series data set

### 3.3.2. The Autoregressive Distributed Lag Model (ARDL)

Most of past studies have used the Johansen co-integration and Engle-Granger causality technique to determine the long-term relationships between variables of interest. This is because many researchers confirms that most of the accurate method to employ this method when the variables of interest are integrated in the same order. Recently, however, a series of studies by Pesaran et al. (2001); Pesaran and Shin(1999) and Nayaran(2004); have introduced an alternative co-integration technique known as the 'Autoregressive Distributed Lag (ARDL)' bound test. There are numbers of advantages of using ARDL model also called 'Bound Testing Approach' over conventional Engle-Granger two-step procedure, Maximum likelihood methods of co-integration (Johansen, 1988; Johansen and Jtiselius, 1990). The compensations of using ARDL approach over other methods includes:-

ARDL model is the more statistically significant approach to determine the the co-integration relation in small samples (Pesaran et al., 2001; Nayaran, 2004), while the Johansen co-integration techniques require large data samples for valid estimation of the parameters. This means that the model avoids the problem of biases that arise from small sample size (Chaudhry and Choudhary, 2006). Therefore we employed ARDL approach because relatively the sample was used in the study is small.

The endogeneity problem is adequately addressed. In this approach of Pesaran and Shin(1999) maintain that modeling ARDL with the appropriate number of lags will address autocorrelation and endogeneity problems because it is possible that different variables have different optimal numbers of laggs, whereas in Johansen-type models, this is not permitted. According to Jalil et al. (2008), endogeneity is less of a problem if the estimated ARDL model is free of autocorrelation.

The ARDL approach is that the ARDL approach can be applied whether the regressors are purely ordered zero [I (0)], purely order one [I (1)], or a mixture of both. While other co-integration techniques require all of the regressors to be integrated of the same order; This means that the ARDL approach avoids the pre-testing problems associated with standard cointegration, which requires that the variables be already classified into I(1) or I(0) or mixture of both (Pessaran *et al.,* 2001).

Moreover, the bound testing approach in the long run and short run is that parameters of the model in interested variables are determined simultaneously (Nasiru, (2012). Finally, Appling the ARDL technique we can obtain unbiased and efficient estimators of the model (Narayan, 2004), (Pesaran & Shin 1995). Therefore, this approach becomes popular and suitable for analyzing the long-run relationship and extensively applied in empirical research in the recent years. Hence, ARDL model can be specified as:

$$\Delta LNRGDP_t = \beta_0 + \beta_1 LNRGDP_{t-1} + \beta_2 LNPC_{t-1} + \beta_3 LNMS_{t-1} + \beta_4 LNBL_{t-1} + \beta_5 LNGE_{t-1}$$

$$+ \beta_6 LNINFLATION_{t-1} + \beta_7 LNTO_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta LNRGDP_{t-i}$$

$$+ \sum_{j=1}^{q} \alpha_j \Delta LNPC_{t-j} + \sum_{k=1}^{r} \alpha_k \Delta LNMS_{t-k} + \sum_{l=1}^{s} \alpha_l \Delta LNBL_{t-l} + \sum_{m=1}^{v} \alpha_m \Delta INGE_{t-m}$$

$$+ \sum_{n=1}^{y} \alpha_n \Delta LNINF_{t-n} + \sum_{o=1}^{w} \alpha_o \Delta LNTO_{t-o} + U_t - - - - - - (3.2)$$

☞              As represented in the three sector output growth and the aggregate output growth equation of the ARDL model, the symbol $\Delta$ is the difference operator; *p, q, r, s, v, y* and *w* are the lag length with their respective variables and *U t* error term which is assumed to be serially uncorrelated.

✍              $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and $\beta_7$ Indicates coefficients that measure long run relationships between the variable whereas $\alpha_i, \alpha_j, \alpha_k, \alpha_l, \alpha_m, \alpha_n$ and $\alpha_o$ indicates coefficients that measure short-run relationships among the variable.

The first step involved in ARDL model is that testing the null hypothesis of no cointegration relationship which is defined as $H_O = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_5 = \beta_6 = \beta_7 = 0$ against against the alternative hypothesis of $H_1 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0$ of the existence of co integrating relationship between the variables.

The co-integration test has been undertaken on the F-statistic with the help of the bound test of ARDL in E-views 9. The F-test has a non-standard distribution which depends on:

 (1) Whether the variables include in the model are I (0), or I (1)

(2) The numbers of regressors, and

 (3) Whether the model contains an intercept and/or a trend (Narayan, 2004). Thus Pesaran (1997) and Pesaran*et al.* (2001) have come up with two sets of critical values which are called upper and lower critical bound for co-integration test. The lower critical bound assumes that all the variables are I(0), meaning that there is no co-integration among the variables, while the upper bound takes that all the variables are I(1). If the *F*-statistic is greater than the upper critical bound, then the null hypothesis will be rejected suggesting that there is a presence of long-run

co-integration relationship among the variables. If the F-statistics falls below the lower critical bound value, it implies that there is no cointegration relationship. But, when the F-statistic lies within the lower and upper bounds, then the test is inconclusive or no decision made. In this case, unit root tests should be conducted to assure the order of integration of the variables (Pesaran *et al.,* 2001). This is due to the fact that ARDL bound testing is inapplicable when the variables are integrated of order 2 or higher order.

The standard test for a unit root is to use Augmented-Dickey (ADF) and Phillips-Perron (PP) t-test statistics. The selection of the lag length will be based on the Schwartz Bayesian Criterion (SBC) or Akaike Information Criterion (AIC) which will be automatically selected by E-views software. Moreover, the researcher will be not going to employ the bound critical value developed by Pesaran*et al.* (2001) because of the computed critical values are based on large sample size (500 and more) rather, we applied the bound critical values developed by Narayan (2004) which was developed based on small sample size ranging from 30 to 80 observations in which E Views automatically produce critical value with corresponding computed F-statistic. To conduct the study our sample size will also relatively small this is 41 years observations.

After the testing in which existence of cointegration among the variables are confirmed, the long-run and error correction estimates of the ARDL model are obtained.

Before proceed to the estimation of selected model by using ARDL, the orders of the lags in the ARDL Model will be selected by the Akaike Information criterion (AIC) or the Schwarz Bayesian criterion (SBC). According to Pesaran and Shin (1999) recommend choosing a maximum of 2 lags for annual data series. However, the maximum lag length will be chosen automatically in the latest version of E views in which it will be not included in the previous version. From this, the lag length that minimizes Akaike Information criterion (AIC) will be selected.

The diagnostic test will be the mandatory tasks for selected ARDL model so as to examine validity of the short- run and long-run estimation in the ARDL model. The diagnostic test such as Heteroscedasticity test (Brush & Godfray LM test), Serial correlation test (Brush & Godfray LM test), Normality (Jaque-Bera test) and Functional form (Ramsey's RESET) test were undertaken. Similar to residual diagnostic test, the parameter stability test of the model will be also conducted.

With the existence of cointegration, the short run elasticities can also be derived through constructing the error correction of the series in the following for in each sector respectively.

$$\Delta LNRGDP_t = \beta_0 + \sum_{i=1}^{p} \alpha_i \Delta LNRAGDP_{t-i} + \sum_{j=1}^{q} \alpha_j \Delta LNPC_{t-j} + \sum_{k=1}^{r} \alpha_k \Delta LNMS_{t-k}$$
$$+ \sum_{l=1}^{s} \alpha_l \Delta LNBLR_{t-l} + \sum_{m=1}^{v} \alpha_m \Delta INGE_{t-m} + \sum_{n=1}^{y} \alpha_n \Delta LNINF_{t-n}$$
$$+ \sum_{o=1}^{w} \alpha_0 \Delta LNTO_{t-o} + \gamma ECM_{t-1} + U_t ------------(3.3)$$

### 3.3.3 Unit Root Test

The necessary condition to be addressed for testing unit root test is to check whether the variables enter in the regression are not order two (I.e. I(2)) which considered as a precondition in employing ARDL model. Therefore, running any sort of regression analysis is impossible without testing for time series variables. So, the first step in this study is testing unit root before running regression analysis. The testing procedure for the ADF unit root test is specified as follows:

$Xt$=α+δt + μxt-1+ $\sum_{o=1}^{p} B \Delta xt\text{-}I$ +εt----------------------------------------------------3.4

where is $Xt$ a time series variables which are mentioned above in this model at time **t**, $\delta$ is a time trend variable; **Δ** denotes the first difference operator; is the error term; $\rho$ is the optimal lag length of each variable chosen such that first differenced terms make $\varepsilon t$ a white noise. Thus, the ADF test the null hypothesis of no unit root (stationary) which is expressed as follows.

H0: μ=0; H1; μ≠ 0----------------------------------------------------------------------3.5

Regarding decision of unit root test, if the t value or t-statistic is more negative than the critical values, the null hypothesis (I.e. H0) is rejected and the conclusion is that the series is stationary. Conversely, if the t-statistic is less negative than the critical values, the null hypothesis is accepted and the conclusion is that the series is non-stationary. Failure to reject the null hypothesis of unit root test leads to take the test on the difference of the time series to come up out with stationary variable for analysis.

### 3.3.4 Granger Causality Test

VAR models themselves do not allow us to make statement about causal relationships so the study uses Granger Causality Test. The concept of granger causality relates to whether one variable can help improve the forecast of another. A variables Y is said to be caused by a variable X if Y can be predicted better from past values of both Y and X than from past values of Y alone. Granger causality tests are tests of forecast capacity, i.e., to what extent does one series contain information about the other series? It is more of an indicator of precedence than a real causal identification.

Granger (1969) defines causality between two variables y and x as follows: y causes x if the predictability of x increases when y is taken into consideration. This study, therefore, is conducted Granger Causality to find out if the variables can be predicted from others, more specifically to know whether private credit sector as % of GDP, Money supply as % of GDP and bank liquidity ratio as % of GDP as an indictor of financial development in Ethiopia are used to predict the GDP and vice- verse.

Accordingly, once the co-integration for the long-run relationship among the financial sector development and output growth confirmed through bound test approach, the long-run and short-run causality can be examined separately. The long-run and short-run causality between financial development and output growth will be investigated by the vector error correction granger causality framework. The model of VECM will be specified as a matrix form:

$$(1 - L)\begin{bmatrix} LNRGDP_t \\ LNPC_t, MS, LR \end{bmatrix} = \begin{bmatrix} \mu_1 \\ \mu_2 \end{bmatrix} + \sum_{i=1}^{p}(1-L)\begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \beta_{21} & \beta_{22} \end{bmatrix}\begin{bmatrix} LNRGDP_{t-i} \\ LNPC_{t-i} \ MS, LR \end{bmatrix} +$$
$$\begin{bmatrix} \delta_1 \\ \delta_2 \end{bmatrix}\begin{bmatrix} LNRGDP_{t-1} \\ LNPC_{t-1}, LR, MS \end{bmatrix}(ECM_{t-1}) + \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix}$$

---------------------------------------------3.6

As specified above model, error correction term of vector error correction model can be used to estimate the direction of causality in long-run. When the output growth expressed in term of real GDP are taken as dependent variable, the t- ratio of lagged error correction term (ECMt-1) negative and significant or other word significant and negative coefficient of lagged error term in above four equation indicates that financial development is granger cause of output growth in the long-run. In order to determine short run causality relation, the Wald test was applied. As result,

the coefficients related the lagged values of financial development indicator are found to significant as a whole, it can be stated that financial development granger cause

Similarly, when financial development expressed as the dependent variable, the significant and negative coefficient of lagged error correction term indicates that direction of causality running from output growth to financial development. On another hand, the coefficient of lagged value of output growth indicates that output growth granger cause of financial sector development.

# CHAPTER FOUR

## RESULTS AND DISCUSSION

### 4.1. Unit Root Test Analysis

The bounds test approach to  co-integration  does not need pre-testing for stationary of the variables included in the model, but still, it is important to carry out stationary tests on all the series. The justification behind the unit root test is to take a care on the order of integration not above I(1) in which we cannot apply ARDL bounds test to co-integration.

 Therefore, it was necessary to test for stationary of the series before any econometric analysis was done. It is not able that stationary properties of time series are investigated by testing for unit roots. There are several methods for testing for stationary. Thus, this study used the commonly used Augmented Dickey-Fuller (ADF) and the Phillip-Perron (PP) unit root tests. The unit root tests results are presented in Table 1.

Table 1 below deals with unit root results of the series at the level and first differences including constant only and intercept with trend specification so as to capture the variables stationary. According to ADF test, all the variable are non- stationary at level and become stationary at the first difference with intercept, and intercept with trend at one percent level of significance except government expenditure as percentage of GDP become stationary at 5% level of significance under Phillip-Perron (PP) unit root tests. However, real GDP and inflation rate become stationary at level form under Phillip-Perron (PP) unit root tests only.

Similarly, the PP test implies that bank liquidity ratio and government consumption expenditure as percentage of GDP are level stationary at 5% and 10%.significance levels respectively, whereas real GDP and inflation rate are also level stationary at 1% significance level.

The remaining variables are fist difference stationary at 1% of significance means that the null of non-stationarity is rejected under the Phillip-Perron (PP) unit root tests with intercept specification only. In this case, PP suggests that three variables are I (1) while remaining four variables are I (0). On the other hand, in case of PP test with intercept and trends specification, all variables, except inflation that is I (0), appear I (1) at 1% significance level. These results indicate that, with both types of specifications, inflation series is stationary at level with rejection rule of 1% which would not allow us to apply the Johansen approach of co-integration. This is

the critical justification for the reason why we are using the ARDL approach (bounds test approach of co-integration) developed by Pesaran et al. (2001).

*Table 1. Augmented Dickey-Fuller and Phillip-Perron unit root tests*

| | | Augmented Dickey-Fuller test statistics (ADF Test) | | | | | |
|---|---|---|---|---|---|---|---|
| | | With intercept | | | With intercept and trend | | |
| **S. no.** | *Variable* | *At level* | *1st difference* | *Order of integration* | *At level* | *difference 1st* | *integration Order of* |
| **4** | *Ln(GDP)* | 2.1126 | -3.9105*** | I(1) at 1% | 0.0606 | -6.3814*** | I(1) at 1% |
| **5** | *Ln(PC)* | -0.4719 | -8.3341*** | I(1) at 1% | -2.2032 | -8.2226*** | I(1) at 1% |
| **6** | *Ln(MS)* | 2.1425 | -3.7991*** | I(1) at 1% | -1.0064 | -6.9945*** | I(1) at 1% |
| **10** | *Ln(BLR)* | 0.2267 | -7.0325*** | I(1) at 1% | -1.7967 | -7.6794*** | I(1) at 1% |
| **11** | *Ln(GE)* | -1.6611 | 3.3974** | I(1) at 5% | 0.2226 | -4.4983*** | I(1) at 1% |
| **12** | *Ln(INF)* | 2.1859 | -8.7494*** | I(1) at 1% | -2.3255 | -8.6444*** | I(1) at 1% |
| **13** | *Ln(TO)* | -1.0380 | -5.9054*** | I(1) at 1% | -1.9220 | -5.8217*** | I(1) at 1% |
| | | Phillip-Perron (PP) unit root tests | | | | | |
| **4** | *Ln(GDP)* | 4.7027*** | | I(0) at 1% | 0.1939 | -5.9141*** | I(1) at 1% |
| **5** | *Ln(PC)* | -0.7657 | -8.3341*** | I(1) at 1% | -2.2033 | -8.2226*** | I(1) at 1% |
| **6** | *Ln(MS)* | 3.4072** | | I(0) at 5% | -0.9557 | -7.1682*** | I(1) at 1% |
| **10** | *Ln(BLR)* | 0.4310 | -6.9849*** | I(1) at 1% | -1.4530 | -7.8627*** | I(1) at 1% |
| **11** | *Ln(GE)* | -2.8696* | | I(0) at 10% | -2.5591 | -8.1021*** | I(1) at 1% |
| **12** | *Ln(INF)* | -4.2954*** | | I(0) at 1% | -4.2601*** | | I(0) at 1% |
| **13** | *Ln(TO)* | -1.0679 | -5.9033*** | I(1) at 1% | -2.0182 | -5.8186*** | I(1) at 1% |

*Source*: Author's computation of E view 9 result

Notes: The sign of *, ** and *** represents the rejection of the null hypothesis of no stationary at 10%, 5% and 1% significant level respectively. The null hypothesis is that the series is non-stationary or the series has a unit root against alternative hypothesis that the series are stationary. Akaike info criterion (AIC) is used to determine the lag length while testing the stationary of all variables.

Moreover, the precondition of using ARDL model is that the dependent variable must be non-stationary at a level which confirmed on the above table under the ADF test.

## 4.2. Long-run ARDL Bounds Tests for Co-integration

As far as we determined the stationary nature of the variables, the next task in the bounds test approach of co-integration is estimating the ARDL model using the appropriate lag length selection criterion. In other word, ARDL bounds analysis is used to investigate the presence of long-run relation among the variables included in the model. In order to undertake co-integration test with help of ARDL bound test, the maximum lag length must be determined. This is because an important issue addressed in employing ARDL is selecting optimum lag length. The model was estimated by ARDL and the optimal lag was selected by Akaike Information criterion (AIC) method.

According to Pesaran and Shin (1999) and Nayaran (2004) recommend choosing a maximum of 2 lags for annual data series Therefore, we set recommended the maximum lag length at 2 years for which are sufficiently long enough for annual data series to investigate the variable relationship and then AIC is employed to choose at the best ARDL mode (Lutkephl, 2005).

*Table 2. Bound Test for Co-integration*

| Levels | Bounds | Critical Values |
|---|---|---|
| 10% Level | *Lower Bound I(0)* | 2.12 |
| | *Upper Bound I(1)* | 3.23 |
| 5% Level | *Lower Bound I(0)* | 2.45 |
| | Upper Bound I(1) | 3.61 |
| 2.5% Level | *Lower Bound I(0)* | 2.75 |
| | *Upper Bound I(1)* | 3.99 |
| 1% Level | *Lower Bound I(0)* | 3.15 |
| | *Upper Bound I(1)* | 4.43 |
| **F-Statistics ARDL (2, 0, 0, 2, 0, 1, 0)** | | **7.22\*\*\*** |

*Source*: Author's computation of E view 9 result

**Notes**: ARDL Model is automatically selected on the basis of minimum value of Akaike info criterion (AIC). We obtain critical values for upper and lower bounds from Peseran et al. (2001) table CI(iii) at page 300 where ARDL model uses unrestricted intercept but no trend with k=6. The sign of \*, \*\*, and \*\*\* indicate the level of significance at 10%, 5%, and 1% to reject the null hypothesis of no long-run relationships exist respectively.

According to the result shown in the table 2, we have the upper and lower Narayan (2004) critical values to compare with corresponding F statistics in order to reject or accept the null hypothesis of no long-run relationship among the variables. As we have discussed earlier, for small sample ranging from 30 to 80 years' data, we have been used Narayan (2004) critical values in which E Views software provided it automatically.

As the result observed from the table 2 depicts that F-statistic is 7.22 which is greater than the upper bounds critical value at 1% significance level. This clearly evidenced that there is a strong evidenced long-run relationship between economic growth and explanatory variables. Therefore, the null hypothesis of no long-run relationship is rejected at 1% significance level and alternative

hypothesis of the existence of long-run relationship between the variables is accepted.  In other words, the variables included in the model have long-run relationship which is a base for estimating the long-run impact of the explanatory variable on economic growth at large.

### 4.3. Long-run and Short-run ARDL Model Estimation

Once co-integration among economic growth and all explanatory variables through bound test are confirmed, then long-run estimation of the model comes next. Accordingly, The ARDL (1, 0, 0, 2, 0, 1, 0) can be estimated for long-run.

*Estimated Long-run Coefficient of Aggregate Output Growth*

**Table 3**. Estimated Long-run Coefficient of Aggregate Output Growth

| Variable | Long-run Coefficient |
|----------|----------------------|
| Ln(PC) | 0.2013*** |
|  | (0.0384) |
| Ln(MS) | 0.1861*** |
|  | (0.0257) |
| Ln(BLR) | 0.1221*** |
|  | (0.0283) |
| Ln(GE) | -0.0722 |
|  | (0.0909) |
| Ln(INF) | -0.0008 |
|  | (0.0015) |
| Ln(TO) | -0.1504** |
|  | (0.0640) |
| C | 7.2958*** |
|  | (0.4007) |

*Source*: Author's computation of E view 9 result

**Notes**: The sign of *, **, and *** indicate the levels of significance at 10%, 5%, and 1% respectively.

In long-run, most of the coefficients of explanatory variables have their expected theoretical or hypothesized signs except for trade openness. Consistent with theory, bank liquidity ratio to GDP in Ethiopia has a positive sign on real GDP. Similarly, money supply (broad money M2) has a positive and significantly determines economic growth in Ethiopia which confirms endogenous growth model that incorporate private credit sector development as an engine for economic growth.

As the results depict that the coefficient of bank liquidity ratio (a measure of financial development) has a positive sign as predicted by the theory and statistically significant at 1% level. This result is also similar to long-run effect of domestic bank liquidity ratio to on economic growth in Ethiopia. It indicates that 1% increase in bank liquidity ratio lead to increase 0.12% in aggregate output growth as measured the real GDP. This is implying that financial development as proxy by bank liquidity ratio facilitate supply of investible funds to productive sector which influences overall output growth through increased investment in the economy.

This finding is consistent with those of Levin et al. (2000), Afangideh (2009), Murty et al. (2012), Helmi et al. (2013) and Mercy et al. (2015). From the theoretical perspective, this finding is also consistent with the theory of Schumpeter which argued the importance of financial development on the economic growth of a country. Conversely, this result is not consistent with the finding of Fozia (2014) and Bekana (2016) for the case of Ethiopia. To this end, bank liquidity ratio is highly significant impact on aggregate output growth implying that financial development is an engine for long-run economic growth.

The long-run estimated coefficient of trade openness has found to be a negative sign and significant effect on economic growth as confirmed by 1 percent level of significance. In our opinion, justification for the inverse relationship is that the liberalizing trade might have exposed the country's infant industry to foreign competition there by adverse effect on long-run real GDP. In this case, domestic investors who are engaged in the non-exportable economic activities were forced to exit from domestic markets. Hence, a percentage increase in the ratio of import plus export to GDP which is trade openness will reduce overall output growth by 0.1504 percent. The finding is similar to the finding conducted by Adebiyi (2006) for Nigeria, Adu et al. (2013) for Ghana, Mercy et al. (2015) for Kenya, Agyei (2015) for Ghana, and Okafor and Shaibu

(2016) for Benin. According to Bibi and Rashid (2014), trade openness could be manifested either positive or negative depending on the values of determinants of trade openness.

## 4.4. Short-run error correction model

An ECM coefficient in the short-run was negative and statistically significant at 1% level with a value of -0.6055. This implies that 60.5 percent of the disequilibrium in the short-run was corrected in the current year which means the short-run distortion is to be corrected towards the long-run equilibrium path. In other words, we found that the deviations in the short-run towards the long-run equilibrium are corrected by 60.5% each year. Relatively better speed of adjustment in aggregate output growth might be due to the developing competitiveness of the financial sector through wide spread involvement of private sector and fast economic growth recorded since 2003/4 in Ethiopia. The short-run coefficient of the model explains the short-run relationships between overall output growth and explanatory variables are depicted as follows.

*Table 3. Short-run Coefficients (Short Run Error Correction Model)*

| Variable | Short-run Coefficient |
|---|---|
| $\Delta Ln(PC_t)$ | 0.1219*** |
| | (0.0275) |
| $\Delta Ln(MS_t)$ | 0.1127*** |
| | (0.0308) |
| $\Delta Ln(BLR_t)$ | 0.0484*** |
| | (0.0178) |
| $\Delta Ln(BLR_{t-1})$ | -0.0337** |
| | (0.0149) |
| $\Delta Ln(GE_t)$ | -0.0437 |
| | (0.052) |
| $\Delta Ln(INF_t)$ | -0.0018*** |
| | (0.0006) |
| $\Delta Ln(TO_t)$ | -0.0911* |
| | (0.0500) |
| $CointEq_{t-1}$ | -0.6055*** |
| | (0.1312) |

CointEq = Ln(GDP) - (0.2013*Ln(PC) + 0.1861*Ln(MS) + 0.1221*Ln(LBR) - 0.0722*Ln(GE) - 0.0008*Ln(INF) - 0.1504*Ln(TO)+7.2958).

**Notes**: The sign of *, **, and *** indicate the levels of significance at 10%, 5%, and 1% respectively.

In short-run, economic growth represented by real GDP is determined by M2 board money (money supply) , bank liquidity ratio and private credits sector as a proxy for financial development which are positive and statistically significant at 1% level of significance. The significant impact of private credit sector on aggregate output growth is consistent with the finding of Bekana (2016).

However, one period lagged bank liquidity has an inverse relation with output growth at aggregate level which is confirmed by 5% significance level. This time lag contribution of the bank liquidity to economic growth might be justified that the financial development takes time to benefit aggregate output growth near the future and other reason may be underdevelopment of the financial sector in the short-run.

The result revealed that trade openness has negative and statistically significant impact aggregate output growth which is a contrast to theoretical expectation. The justification behind for this result may be traded openness leads to competition between foreign investors and domestic investors which have a negative effect on domestic investors that need the protection during an infant stage and another explanation might be a continuous decline of export performance.

This result is consistent with the finding of Mercy et al. (2015) for Kenya, Iheanacho (2016) for Nigeria, and Ofori-Abebrese et al. (2017) for Ghana. On another hand, as expected prior Government consumption expenditure as a ratio of GDP has a negative and insignificant effect on economic growth, whereas inflation rate affects economic growth negatively and significant at 1% significance level.

### 4.5. Diagnostic Test and Model stability

In order to check the verification of the estimated model, diagnostic testing is important prior to undertaking any econometric data analysis. In addition, to test the stability of model, some of the diagnostic tests such as Heteroscedasticity test, Serial correlation test (Brush & Godfray LM

test), Normality (Jaque-Bera test) and Functional form (Ramsey's RESET) test were undertaken so as to proceed the analysis of the model result.

Therefore, diagnostic tests are representing that long-run and short-run estimates are free from serial correlation, misspecification of the short-run model, non-normality of the error term, and heteroscedasticity as indicated blow table 5.

*Table 4. Long-run ARDL (1, 0, 0, 2, 0, 1, 0) Diagnostic Tests*

| **Diagnostic Tests** | *Chi-statistic* | *F-statistic* |
|---|---|---|
| *Breusch-Godfrey Serial Correlation LM Test* | $X^2(2)=3.0477$ <br> *Prob.= 0.0695* | $F(2,27)=2.8873$ <br> *Prob.= 0.0731* |
| *Breusch-Godfrey Heteroskedasticity Test* | $X^2(10)=6.3604$ <br> *Prob.= 0.7841* | $F(10,29)=0.5483$ <br> *Prob.= 0.8411* |
| *Jarque-Bera Normality Test* | $X^2(2)=0.1164$ <br> *Prob.= 0.9434* | NA |
| *Ramsey RESET Test* | $X^2(1)=0.2819$ <br> *Prob.= 0.7799* | $F(1,31)=0.0794$ <br> *Prob.=0.7799* |

*Source*: Author's computation of E view 9 result

## 4.6. Test of Parameter Stability

The stability of the model for long-run and short-run relationship is detected by using the cumulative sum of recursive residuals (CUSUM) which helps as to show if coefficient of the parameters is changing systematically and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests which is useful to indicate if the coefficient of regression is changing suddenly. Accordingly, if the blue line crosses redline which is critical line and never returns back between two critical line, we accept the null hypothesis of the parameter instability whereas the cumulative sum goes inside the area (can returns back) between the two critical lines, then there is parameter stability in the short-run and long-run.

**Figure 2**. Plot of Cumulative Sum of Recursive Residuals
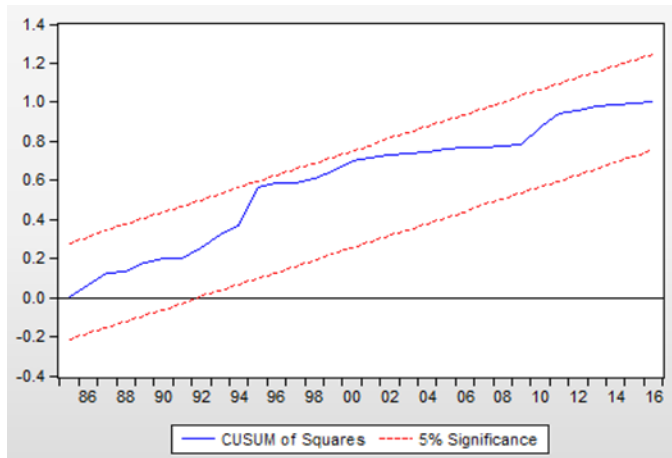


Source: Author's computation of E view 9 result

**Figure 2**. Plot of Cumulative Sum of Squares of Recursive Residuals as the result seen from the figure, the plot of CUSUM test did not cross the critical limits.

The CUSUMSQ test shows that the graphs do not cross the lower and upper critical limits. So, we can conclude that long-run estimates are stable and there is no any structural break.

## 4.7. Granger Causality Test

This study has employed the Granger causality test to determine the direction of causality between co-integrated variables applying the vector error correction version of granger causality tests which would enable us to track the long-run and short-run causality among interested variables (Kyophilavong et al., 2016). In other words, the long-run association can be deduced from the significance of the lagged error correction terms, while the short-run association is deduced from the coefficient of the lagged differenced variables. Therefore, the requirement for long-run causality is that ECT coefficients must be negative and statistically significant. The short-run causality has been tested using the Wald test ($x^2$)

*Table 5. Long- run and Short-run Granger Causality Test*

|  | Null Hypothesis | Obs. | Lags | Coefficient | Prob. |
|---|---|---|---|---|---|
| **Long run** | Ln(BLR) does not Granger Cause Ln (GDP) | 41 | NA | -0.0196 | 0.0004*** |
|  | Ln(GDP) does not Granger Cause Ln (BLR) | 41 | NA | 0.0117 | 0.8015 |
| **Short run** | Ln(BLR) does not Granger Cause Ln(GDP) | 41 | 2 | 4.9937 | 0.0823*** |
|  | Ln(GDP) does not Granger Cause Ln(BLR) | 41 | 2 | 0.4833 | 0.7853 |

*Source*: Author's computation of E view 9 result

**Notes:** The sign of *, **, and *** indicate the levels of significance at 10%, 5%, and 1% to reject the null hypothesis of the direction of causality respectively. The prerequisite for testing granger causality in the long-run based on vector error correction depends on whether two variables are co-integrated or not (Tamba et al., 2014; Balago, 2014). Accordingly, Granger causality test indicated from above result reveals that financial development is essential for the economic growth in Ethiopia that confirms the augment of supply lead growth hypothesis in long-run. This result is in line with early causality study done by Mckinnon (1973) and Shaw (1973), works of King and Levine (1993), and the later study by Helmi et al. (2013) and Agyei (2015). Whereas, the finding is contradicts with Patrick's (1966), Roman (2012), and Ofori-Abebrese et al. (2017) who found the demand following hypothesis which postulates a causal relationship from economic growth to financial development, that is an increasing demand for financial services might lead to an expansion in the financial sector as the economy continuous to grows. Similar to long-run causality, the result at table 6 also reveals that there is uni-directional causality running from total bank liquidity ratio to economic growth in the short-run. This finding is also confirmed supply lead growth hypothesis that means in order to accelerate economic growth, there is a need of financial sector development in the short-run.

# CHAPTER FIVE

## CONCLUSION AND POLICY IMPLICATION

### 5.1 Conclusion

The financial sector of Ethiopia is characterized by the dominance of state ownership and slow development process. The financial sector is basically dominated by the banking system. Financial development indicators such as the ratio of private credit to GDP bank liquidity ratio to GDP government expenditure to GDP and broad money to GDP further indicate the under development of the financial sector.

Moreover, a substantial gap between saving and investment, which the Ethiopian financial sector is unable to bridge, has led to foreign borrowing to finance investments. Accordingly, this study examined the linkage between financial development and economic growth in Ethiopia during the period from 1975 to 2016. The study employed ARDL bound test approach to examine the long-run and short-run relationship between economic growth and explanatory variables and VECM used to investigate the direction of causality between financial development and output growth.

Before employing ARD model, we have tested stationarity properties of the variables by using ADF and PP tests. The results of unit root test reveal all variables are stationary after the first difference. Regarding to diagnostic and stability test, the result shows that the model is stable and desirable in long- run without any evidence of serial autocorrelation and heteroscedasticity as well as no any evidence for structural break. A bound test approach to co-integration indicated that bound test (F-statistic) value is greater than the upper critical value which implies there is a long-run relationship between economic growths their respective determinant.

The empirical results implied evidence of a long-run and short-run positive impact of financial development on economic growth in Ethiopia. This implies a financial sector and financial institution act as an input to support and accelerate economic growth short-run and long-run. With regard to control variables, except inflation and government expenditure as a percentage of GDP, all variables significantly influence economic growth in the long-run and resulted as we have expected from economic theory. Other than inflation, government expenditure, trade openness, money supply, bank liquidity ratio and financial indicator were the pioneer

determinant of economic growth in the short run. Furthermore, VECM granger causality tests show that the direction of causality is running from financial development to economic growth both in short-run and long-run. This study found the supply-leading hypotheses held in the case of Ethiopia

## 5.2 Policy Implication

 Based on the empirical analysis, it is observed that the financial sector has a long-run impact on the economic growth of Ethiopia. Since Ethiopia is dominated by the banking system, the financial sector has to deepen by strengthening the banking sector so as to maintain a sustainable economic growth.

Banking development can be strengthening by having a strong regulatory system that strengthens the private sector as it is the engine of economic growth.  Credit to the private sector has to be given high emphasis in order to boost investment thereby reducing foreign borrowing. Financial constraints that are imposed on the private sector should be relaxed and more focus must be on ways to promote private sector development.

Financial development has an insignificant effect on economic growth of Ethiopia in the short-run, policy makers should focus on long-run policies such as improving the financial markets and introducing capital markets. On other hand, in the long-run, this policy will have a significant effect on economic growth.

Therefore, based on the finding, government should strengthen its current effort on development of financial sector to accelerate economic growth in the country. Moreover, due the evidence of supply leading hypothesis, the policy makers should focus long-run policies mainly improving financial markets, so as to make the efficient and effective allocation of resources among the productive sector which affects long-run economic growth in Ethiopia.

In addition, strategies that enable a strong economic growth should be implemented as the growth of an economy would have repercussions on the development of the financial system.

## REFERENCES

Abu-Bader, S. And Abu-Qarn, S. (2005). Financial Development and Economic Growth: Time-Series Evidence from Egypt. Discussion Paper No.05/14.

Acharya, D., Amanulla, S., and Joy,S. (2009). Financial Development and Economic Growth in Indian States: An Examination. International Research Journal of Finance and Economics.

Adebola, S.S., and Dahalan, J. (2012). Capital Mobility: Application of Saving Investment Link for Tunisia. International Journal of Economics and Financial Issues, 2(1), pp. 1-11.

Adu, G., Marbuah, G., and Mensah, J.T. (2013). financial development and economic growth in Ghana: Does the measure of financial development matter? Review of Development Finance, 3(4), pp. 192-203.

Adusei, M. (2012). Financial Development and Economic Growth: Is Schumpeter Right? British Journal of Economics, Management and Trade, 2(3), pp. 265-78.

Adusei, M., and Nkrumah, K. (2013). Financial Development and Economic Growth: Evidence from Ghana. The International Journal of Business and Finance Research, 7(5), pp. 61-76.

Afangideh, U.J. (2009). Financial Development and Agricultural Investment in Nigeria: Historical Simulation Approach. Journal of Economic and Monetary Integration, 9(1), pp. 74-97.

Agyei, C.K. (2015). Financial Development and Economic Growth: The Causal Relationship in Ghana Kwame Nkrumah University of Science and Technology.

Alemayehu, G. (2006). The Structure and Performance of Ethiopia's Financial Sector in the Pre- and Post-Reform Period with a Special Focus on banking sector. Research Paper No: 2006/112.

Anwar, S., and Cooray, A. (2012). Financial development, political rights, civil liberties and economic growth: Evidence from South Asia. Economic Modelling, 29(3), pp. 974-981.

Apergis, N., Filippidis, I. and Economidou, C. (2007). Financial Deepening and Economic Growth Linkages: A Panel Data Analysis. Review of World Economics, Vol. 143, pp 179-198.

Arestis, P. and P. Demetriades (1997). Financial Development and Economic Growth: Assessing the Evidence. Economic Journal, 107: 783-799.

Balago, G. (2014). Financial Sector Development and Economic Growth in Nigeria: An Empirical Investigation. International Journal of Finance and Accounting, 3(4), pp. 253-265.

Beck.T, (2011). The Role of Finance in Economic Development: Benefits, Risks and Politics. European Banking Center Discussion Paper No. 2011-038.

Beck, T., A. Demirgüç-Kunt, and V. Maksimovic (2005). Financial and Legal Constraints to Firm Growth: Does Size Matter? Journal of Finance.

Beck, T., Demirguc-Kunt, A., and Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. Journal of Banking and Finance, 37(2), pp. 433-447.

Bibi, S., and Rashid, H. (2014). Impact of Trade Openness, FDI, Exchange Rate and Inflation on Economic Growth: A Case Study of Pakistan. International Journal of Accounting and Financial Reporting, 4(2), pp. 236-257.

Bittencourt, M. (2012). Financial Development and Economic Growth in Latin America: is Schumpeter Right? Journal of Policy Modeling, 34(3), pp. 341-355.

Bolbol, A., Fatheldin, A., and Omran, M. (2005). Financial Development, Structure, and Economic Growth: the case of Egypt. Research International Business and Finance, 19(1), 171-194.

Bloch, H. and Tang.H.K. (2003). the Role of Financial Development in Economic Growth. Progress in Development Studies 3, pp. 243-251

Calderon, C.and Liu, L. (2003). The Direction of Causality between Financial Development and Economic Growth. Journal of Development Economics 72:321-334.

Caporale, G.M., Howells, P.G.A., and Soliman, A.M. (2004). Stock Market Development and Economic Growth: The Causal Linkage. Journal of Economic Development, 29(1), pp. 33-50.

Christopoulos, D. K. and Tsionas E.G., (2004). Financial Development and EconomicGrowth: Evidence from Panel Unit Root and Co-integration Test. Journal of Development Economics, 73: 55-74

De Gregorio, J., and Guidotti, P. (1995). Financial development and economic growth. World Development, 23(3), pp. 433–448.

Bekana, D.M. (2016). Does Financial Sector Development Drive Economic Growth in a Post-Communist Economy? Evidence from Ethiopia. Economic Insights - Trends and Challenges, 68(1), pp. 15-38.

Demetriades, P. and K. Hussein (1996). Does Financial Development Cause EconomicGrowth? Time Series Evidence from 16 Countries. Journal of Development Economics, 51: 387-411.

Demirguc-Kunt, A., and Levine, R. (2008). Finance, Financial Sector Policies, and Long-Run Growth. Policy Research Working Paper No. 4469. World Bank, Washington, DC.

Demirgüç-Kunt, A. and V. Maksimovic (1998). Law, Finance, and Firm Growth. Journal of Finance, 53: 2107-2137

Ellahi, N. (2011). How development of finance contributes to poverty alleviation and growth: A time series application for Pakistan. African Journal of Business Management, 5(30), pp. 12138-12143.

Fozia, M. (2014). the Nexus between Economic Growth and Financial Development: The Case of Ethiopian Economy. Proceedings of 8th National Student Research Forum, (pp. 23-52). Addis Ababa University, Ethiopia.

Giuliano, P., and Ruiz-Arranz, M. (2009). Remittances, Financial Development, and Growth. Journal of Development Economics , 90(1), pp. 144-152. Gujarati. (2004). Basic econometrics. McGraw-Hill Companies, 4th edition.

Gries, T., Kraft, M., and Meierrieks, D. (20089). Linkages between financial deepening, trade openness and economic development: Causality Evidence from Sub-Saharan Africa. World Development , 37(12), pp. 1849-1860.

Guiso, L., P. Sapienza and L. Zingales (2002). Does Local Financial Development Matter? National Bureau of Economic Research Working Paper No. 8922.

Haile Kibret Fantaye and Kassahun Aberra (2011). Linkage between Financial market Development and Economic Growth in Ethiopia. Paper Presented at the 9thInternational Conference of EEA/EEPRI

Helmi, H., Hakimi, A., and Rashid, S. (2013). Multivariate Granger Causality between Financial Development, Investment and Economic Growth: Evidence from Tunisia. Journal Quantitative Economics,

Iheanacho, E. (2016). The Impact of Financial Development on Economic Growth in Nigeria: An ARDL Analysis. Economies, 4(26), pp. 1-12. DOI: 10.3390/economies4040026

Imoughele, L.E., and Ismaila, M. (2013). Commercial Bank Credit Accessibility and Sectoral Output Performance in a Deregulated Financial Market Economy: Empirical Evidence from Nigeria. Journal of Finance and Bank Management, 1(2), pp. 36-59.

Jalil, A., Ma, Y., and Naveed, A. (2008). The finance-fluctuation nexus: Further evidence from Pakistan and China. International Research Journal of Finance and Economics, 3(14), pp. 212-231.

Johansen, S. (1988). Statistical Analysis of Cointegration Vectors. Journal of Economic Dynamics and Control, 12(2/3), pp. 231-254. DOI: 10.1016/0165-1889(88)90041-3.

Johansen, S., and Jtiselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration - with Applications to the Demand for Money. Oxford Bulletin of Economics and Statistics, 52(2), pp. 169-210.

Jude, C. (2010). Financial Development and Growth: A Panel Smooth Regression Approach. Journal of Economic Development, Vol 35.

Jung, W. S. (1986). Financial Development and Economic Growth: International Evidence. Economic Development and Cultural Change, 34: 333-346.

Karbo, S.M., and Adamu, P.A. (2011). Financial Development and Economic Growth in Sierra Leone. Journal of Monetary and Economic Integration, 9(2), pp. 31-61.

Khan, S. and Senhadji, S. (2000). Financial Development and Economic Growth: An Overview. IMF Working Paper, No. 00/209

King, R.G., and Levine, R. (1993). Finance and Growth: Schumpeter Might be Right. The Quarterly Journal of Economics, 108(3), pp. 717-737.

Kyophilavong, P., Uddin, G.S., and Shahbaz, M. (2016). The Nexus between Financial Development and Economic Growth in Laos. Global Business Review 17(2), pp. 303-317. DOI: 10.1177/0972150915619809

Levine, R. (2004). Finance and Growth: Theory and Evidence. NBER Working Paper Series No. 10766.

Levine, R. (2004). Finance and Growth: Theory and Evidence. Hand book of Economic Growth.

Levine, R. and S. Zervos (1998). Stock Markets, Banks, and Economic Growth. American Economic Review, 88: 537-558.

Levine, R., Loayza, N., and Beck, T. (2000). Financial Intermediation and Growth: Causality and Causes. Journal of Monetary Economics, 46(1), pp. 31-77.

Loayza, N., and Ranciere, R. (2006). Financial Development, Financial Fragility, and Growth. Journal of Money, Credit and Banking, 38(4), pp. 1051-1076.

Love, I. (2003). Financial Development and Financing Constraint: International Evidence from the Structural Investment Model. Review of Financial Studies, 16: 765-791.

Lutkephl, H. (2005). New Introduction to Mutple Time Series Analysis. Berlin: Spinger.

McKinnon, R. (1973). Money and Capital in Economic Development. Washington, DC: The Brooking Institute.

Murcy, K.J., Kalio, A., and Kibet, L. (2015). Effect of Financial Development on Economic Growth in Kenya: Evidence from Time Series Analysis. European Journal of Business and Social Sciences, 3(11), pp. 62-78.

Murty, K.S., Sailaja, K., Demissie, W.M. (2012). The Long Run Impact of Bank Credit on Economic Growth in Ethiopia: Evidence from Johansen's Multivariate Co-Integration Approach. European Journal of Business and Management, 4(14), pp. 20-33.

Nayaran, K. (2004). Reformulating Critical Values for the Bounds F-statistics Approach to Cointegration: An Application to the Tourism Demand Model for Fiji. Discussion Papers No: 02, Monash University, Victoria, Australia.

Nkoro, E., and Uko, A.K. (2013). Financial Sector Development-Economic Growth

Nexus: Empirical Evidence from Nigeria. American International Journal of Contemporary Research, 3(2), pp. 55-78.

Odhiambo, N. (2010). Finance-Investment-Growth Nexus in South Africa: An ARDL-Bounds Testing Procedure. Economic Change and Restructuring, 43(3), pp. 205-219.

Ofori-Abebrese, G., Pickson, R.B., and Diabah, B.T. (2017). Financial Development and Economic Growth: Additional Evidence from Ghana. Modern Economy, 8(2), pp. 282-297.

Okafor, C. and Shaibu, I. (2016). Modelling Economic Growth Function in Nigeria: An ARDL Approach. Asian Journal of Economics and Empirical Research, 3(1), pp. 84-93.

Patrick, H. (1966). Financial Development and Economic Growth in Underdeveloped Economies. Economic Development and Cultural Change, 14(2), pp. 174-89.

Pehlivan Jenkins, H., and Katircioglu, S.T. (2010). The Bounds Test Approach for Cointegration and Causality between Financial Development, International Trade and Economic Growth: The Case of Cyprus. Applied Economics, 42(13), pp. 1699-1707.

Pesaran, H., and Shin, Y. (1999). An Autoregressive Distributed Lag Modeling Approach to Co-integration Analysis. UK: Cambridge University Press.

Pesaran, H., Shin, Y., and Smith, R. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16(3), pp. 1924-1996.

Quah, D., (1993). Empirical cross section dynamics in economic growth. European Economic Review 37, 426–34

Quartey, P., and Prah, F. (2008). Financial Development and Economic Growth in Ghana: Is there a causal link. African Finance Journal, 10(1), pp. 28-54.

Rafindadi, A.A., and Yusof, Z. (2013). Is Financial Development a Factor to the Leading Growth Profile of the South African Economy? Measuring and Uncovering the Ridden Secret. International Journal of Economics and Empirical Research, 1(9), pp. 99-112.

Rahman, H. (2004). Financial Development-Economic Growth Nexus: A Case Study of Ba Arestis, P., A.D. Luintel and K.B. Luintel (2005). Financial Structure and Economic Growth.

CEPP Working Paper No 06/05.ngladesh. The Bangladesh Development Studies, Vol.30, No.3/4, pp 113-128

Rajan, R. G. and L. Zingales (1998). Financial Dependence and Growth. American Economic Review, 88: 559-586

Rioja, F. and N.Valev (2004). Finance and the Sources of Growth at Various Stages of Economic Development. Economic Inquiry, 42: 27-40.

Roman, T. (2012). The Link between Financial Development and Economic Growth in Ethiopia. Adis Abeba: Unpublished Masters Thesis.

Rousseau, P. L. and R. Sylla (2000). Emerging Financial Markets and Early U.S Growth. National Bureau of Economic Research Working Paper No.7448.

Sanusi, N.A., and Sallah, N.H.M. (2007). Financial Development and Economic Growth in Malaysia: An application of ARDL Approach. Working Paper.

Shahbaz, M. (2013). Financial Development, Economics Growth, Income Inequality Nexus: A Case Study of Pakistan. International Journal of Economics and Empirical Research, 1(3), pp. 24-47.

Shaw, E. (1973). Financial Deepening in Economic Development. New York: Oxford.

Solow, R. (1956). A Contribution to the Theory of Economic Growth. Quarterly Journal of Economics, 70(1), pp. 65-94.

Tamba, J.G., Koffi, F.D., Lissouck, M., Ndame, M., and Afuoti, N.E. (2014). A Trivariate Causality Test: A Case Study in Cameroon. Applied Mathematics, 5(13), 2028-2033. DOI: 10.4236/am.2014.513195

Valickova, P., Havranek, T., and Horvath, R. (2015). Financial Development and Economic Growth: A Meta-Analysis. Journal of Economic Surveys , 29(3), pp. 506-526.

Wurgler, J. (2000), "Financial Markets and the Allocation of Capital", Journal of Financial Economics, 58: 187-214.

## APPENDEX 1

*Heteroskedasticity Test*

**Heteroskedasticity Test: Breusch-Pagan-Godfrey**

| | | | |
|---|---|---|---|
| F-statistic | 1.957417 | Prob. F(7,25) | 0.1023 |
| Obs*R-squared | 11.68323 | Prob. Chi-Square(7) | 0.1115 |
| Scaled explained SS | 13.96616 | Prob. Chi-Square(7) | 0.0518 |

## APPENDEX 2

*Autocorrelation Test*

Sample: 1975  - 2016

Included observations: 41

Q-statistic probabilities adjusted for 2 dynamic regressors

| Autocorrelation | Partial Correlation | | AC | PAC | Q-Stat | Prob* |
|---|---|---|---|---|---|---|
| | | 1 | -0.030 | -0.030 | 0.0316 | 0.859 |
| | | 2 | -0.346 | -0.347 | 4.4912 | 0.106 |
| | | 3 | -0.012 | -0.042 | 4.4971 | 0.213 |
| | | 4 | -0.027 | -0.171 | 4.5271 | 0.339 |
| | | 5 | -0.147 | -0.207 | 5.4197 | 0.367 |
| | | 6 | -0.001 | -0.121 | 5.4198 | 0.491 |
| | | 7 | 0.192 | 0.050 | 7.0574 | 0.423 |
| | | 8 | -0.163 | -0.261 | 8.2909 | 0.406 |
| | | 9 | 0.001 | 0.027 | 8.2909 | 0.505 |
| | | 10 | -0.031 | -0.266 | 8.3394 | 0.596 |
| | | 11 | -0.105 | -0.185 | 8.9195 | 0.629 |
| | | 12 | 0.081 | -0.102 | 9.2779 | 0.679 |
| | | 13 | 0.136 | -0.069 | 10.353 | 0.665 |
| | | 14 | 0.214 | 0.194 | 13.138 | 0.516 |
| | | 15 | -0.087 | -0.003 | 13.629 | 0.554 |
| | | 16 | -0.198 | -0.146 | 16.282 | 0.433 |

*Probabilities may not be valid for this equation specification.

**APPENDEX 3**

*Granger Causality test*

Pairwise Granger Causality Tests

Sample: 1975 - 2016

Lags: 2

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|---|---|---|---|
| DLM2 does not Granger Cause DLRGDP | 41 | 2.01511 | 0.1529 |
| DLRGDP does not Granger Cause DLM2 | | 4.31954 | 0.0236 |