The Role of Banking Sector In Capital Accumulation and Economic Growth of Ethiopia: An application of ARDL approach to Co-integration

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A study submitted to the department of Management in partial fulfillment of the requirements for the Degree of Master of Business Administration in Financial Service-specialization in Banking

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Tadesse Yirgu

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ABRIVATION AND ACRONYMS

- ARDL Autoregressive Distributed Lag
- CUSUM Cumulative Sum of Recursive Residuals
- CUSUMQ Cumulative Sum of square Recursive Residuals
- ECM Error Correction Model
- ECT Error Correction Term
- EU European Union
- GCF Gross Capital Formation
- GDP Gross Domestic Product
- GFCF Gross Fixed Capital Formation
- GNS Gross National Saving
- IMF International Monetary Fund
- MENA Middle East And North Africa
- OLS Ordinary Least Square
- RGDP Real Gross Domestic Product
- SSA Sub Saharan African

ABSTRACT

Economists have been arguing regarding the importance of financial development for economic growth. In this connection, the study examine the effect of the role of banking sector on capital accumulation and economic growth of Ethiopia using time series data from 1981 to 2016. The model estimation includes unit root tests, co-integration test using ARDL approach, granger non-causality tests and investigates the short-run and long-run dynamics using VECM. The result of the analysis shows that, in the short-run, deposit has a significantly positive effect on capital accumulation and economic growth; whereas credit has only significant effect on short-run capital accumulation. On the other hand, except deposit which has significant effect on economic growth, the role of banking sector, as measured by deposit and credit, appeared as having no significant effect on long-run capital accumulation & economic growth. It's expected that capital accumulation has a significantly positive effect on long-run economic growth. The analysis made to determine the direction of causality shows the existence of bidirectional causality between deposit and economic growth, while there is a unidirectional causality running from economic growth to credit. The study has only found a unidirectional causality running from capital accumulation to deposit and credit. This confirms the fact that banking sector of the country is not in a position to support long-run investment need which is a precondition for sustainable economic growth. As a result the study recommends policymakers to strengthen the capacity of the banking sector in a way that would mobilize higher savings and efficiently allocate to most productive sector of the economy, so that the country will attain rapid capital accumulation and sustainable economic growth.

Key words: ARDL, Deposit, Credit, Capital Accumulation, Economic Growth

CHAPTER ONE: INTRODUCTION

1.1. BACKGROUND OF THE STUDY

Economists had been arguing regarding the importance of financial sector development for economic growth. In this connection, Lucas (1988) claimed that economists exaggerate the role of financial sector in economic growth. Similarly, Robertson (1952) had asserted that "where enterprise leads finance follows." According to Lucas, the financial sector of the country will only develop in response to greater demand for financial service as the economy expands. There are also empirical studies document consistent findings. For instance, Burzynska (2009) in his investigation of Chinese banking sector identified that the development of state-owned and other commercial banks merely follows economic growth. According to him, the country has managed to grow very fast although its financial sector considered as weak.

However, in contrast with the above view, a growing literature has been reporting that financial sector of the economy, by facilitating the flow of funds from surplus units to deficit units, play a significant role in economic growth (Carlson, et al., 2008). This is also the main reason for many countries to engage in financial sector reform with the aim of enhancing financial system, so that they could efficiently allocate resources to productive investments of innovative entrepreneurs and increased long-run economic growth (Fry, 1997).

Despite countervailing views, there is a preponderance of theoretical and empirical evidence that have reported a significantly positive relationship between financial development and economic growth (Levine, 1996). According to him "there is even evidence that the level of financial development is a good predictor of future rates of economic growth, capital accumulation, and technological change." This is because, a well developed financial system reduces information and transaction cost that influence saving rates, investment decision, technological innovation and long-term economic growth rate (Levine 1996; Demirgüç-Kunt and Levine, 2008).

The intermediation of saving into investment depends on the quality of information available to individual savers, but it may be too costly individual savers to acquire information on their own. Thus financial intermediaries like banks collect process and produce information on possible investments more efficiently than individual savers. By having quality information, financial institutions invest in more promising firms which in turn is a more efficient allocation of capital

that directs capital toward the more productive investments. Thus, countries having an efficient financial system can create a larger pool of savings that leads to higher aggregate investment and faster rate of capital accumulation which in turn leads to economic growth and development (Estrada, et al., 2010).

Considerable researchers report the financial development as a critical determinant of long-run economic growth. For instance, domestic savings mobilization were accounted the most for the contrast between the high growth since 1960 in East Asia and the slow growth in Latin America, two middle-income regions with comparable levels of per capita GDP in the 1960s. Besides, Aghion et al. (2009) in their cross-country study titled "when does a domestic saving matter for economic growth" figured out that lagged value of savings is positively associated with productivity growth in poor countries than in rich. That means the mobilization of savings for investment matters more for low income and capital scarce countries like Ethiopia that typically enjoy higher marginal returns to capital. As supported by the neoclassical theory, this finding is also consistent with the rationale for capital outflow from developed countries to undeveloped.

Similarly, the credit expansion role of the banking sector is another dimension of financial sector development affects long-run economic growth. As also supported by financial economics, it is clear that more developed countries have more robust credit system (Kasekende, 2008). In this regard, empirical studies have documented a significantly positive relationship between credit expansion and economic growth. For example, a study by Murty et al. (2012) has identified that bank credit to private sector affects real GDP per worker through its role of domestic capital accumulation and efficient resource allocation and hence in total factor productivity in the long-run economic growth of Ethiopia. Consistent with this finding, Sanusi and Salleh (2007) have also documented a positive and significant relationship between the credit allocation role of banks and economic growth in Malaysia.

Despite the fundamental role of a financial sector in economic growth, there is still another argument regarding the structure of a financial system in promoting long-term economic growth. According to Lin et al. (2009) efficiency of the financial system in mobilizing savings, allocating capital, diversifying risks and processing information, which in turn affect economic growth, is dependent on the form of institutional arrangement. In this regard, literatures provide competing

views: the bank-based Vs market-based, financial service and judicial views. The proponent of bank-based financial system argued that banks are better at mobilizing savings, identifying good investment and exerting sound corporate governance, particularly during the early stages of economic development and weak institutional arrangement. In contrast, the market-based view emphasizes the advantage of a market in capital allocation and providing risk management tools.

The Judicial system approach which is the special form of the above views claims that the legal origin of a country matters in finance and economic growth argument. According to this view, the market-based financial structure is only efficient in mobilizing and allocating financial resources and thereby bringing long-run economic growth in common-law countries where shareholders rights are well protected and judges have the interpretive flexibility to adapt changes by interpreting the law. On the other hand, Merton and Bodie (1995) proposed the financial service view which minimizes the banks-based versus market-based argument. According to this view banking sector development brings faster economic growth regardless of the level of the stock market development. Similarly, countries with higher liquid stock markets grow faster regardless of the level of banking sector development. Therefore, in countries like Ethiopia, where banking sector dominates the financial sector, and if the financial sector has to increase the rate of capital accumulation and economic growth, the role of banking sector and its efficiency in mobilizing savings and allocating financial resources becomes indispensable.

1.2. STATEMENT OF THE PROBLEM

As evidenced by many empirical researchers, higher savings coupled with high levels of capital formation are prerequisite for long-run economic growth. For this reason, countries search for internal and external sources of funds necessary to meet their investment needs. But, here, one should be know that a country cannot fully rely on external sources of funds and investment. As evidenced by the 1977 Asian financial crisis, this source of funds is highly exposed to a sudden reversal of capital flows (IMF, 1999) and is full of uncertainty. Therefore, in this case, the role of banking sector become indispensable in mobilizing domestic savings and efficiently channeling them into its most productive use that the economy requires for rapid capital accumulation and economic growth.

Similarly, the work of Goldsmith (1969), Jayaratne and Strahan (1996), Kashyap and Stein (2000), Beck et al. (2000), Beck et al. (2003), and Driscoll (2004) etc, have also found that financial sector development flourishes economic growth. In this regard, above all, knowing how well the financial system allocates funds for capital accumulation that has significant effects on economic growth is highly important for developing countries like Ethiopia, where capital is highly scarce. However, to the best of the researcher's knowledge, there is no enough empirical investigation conducted to make sure that whether the role of the banking sector, which account major portion of the financial sector, has effect in capital accumulation and economic growth of the country.

To the best of the researcher's knowledge, there are only limited studies in this regard. These are Murty et al. (2012), Muluneh (2015), and Venkati (2016). Muluneh and Venkati tried to identify the effect of the role of banks, as measured by bank deposit mobilization, credit expansion, and investment, in capital accumulation; however, both studies didn't show the effect on long-run economic growth. Similarly, Murty et al. (2012) tried to identify the long-run effect of banking sector credit on economic growth, however, this study has also ignored the short-run impact on economic growth and the causality thereof; that means, whether banking sector credit induces or simply follows economic growth. Hence, this study is conducted with the essence of addressing these gaps.

1.3. OBJECTIVE OF THE STUDY

1.3.1. General Objective

The main objective of this study is to examine the effect of the role of banking sector in capital accumulation and economic growth of Ethiopia using a time series data.

1.3.2. Specific Objective

I. To examine the effect of the role of banking sector on capital accumulation of Ethiopia.
II. To examine the effect of the role of banking sector on economic growth of Ethiopia.
III. To test the direction of causality between the role of banking sector capital accumulation and economic growth of Ethiopia.

1.4. HYPOTHESIS

In an effort to address the above objectives the study formulates the following hypothesis:

1.4.1. Hypothesis for Capital Accumulation

H1: banking sector deposit has significantly positive effect on gross capital formation

H2: Banking sector credit has significantly positive effect on gross capital formation

H3: Gross national saving has significantly positive effect on gross capital formation

H4: Government expenditure has significantly positive effect on gross capital formation

H5: Inflation has significantly positive effect on gross capital formation

1.4.2. Hypothesis for Economic Growth

H6: Banking sector deposit has significantly positive effect on economic growth

H7: Banking sector credit has significantly positive effect on economic growth

H8: Gross capital formation has significantly positive effect on economic growth

H9: Gross national saving has significantly positive effect on economic growth

H10: Government expenditure has significantly positive effect on gross economic growth

H11: Inflation has significantly positive effect on economic growth

1.5. SIGNIFICANCE OF THE STUDY

The study has the following contribution: first, identifying the effect of the role of banks on economic growth contributes to the argument of finance growth nexus. Beside, identifying the impact of banking sector in economic growth will provide information to various stakeholder of the financial sector to make an informed decision.

Knowing the effect of saving mobilization on capital accumulation and economic growth will provide evidence to the arguments of growth models. The study clarify our understanding of the

role of financial sector in economic growth have policy implications. So, the findings of the study help policymaker to shape their effort towards creating sound banking system that can efficiently mobilize savings and channel for rapid capital formation and thereby bring growth.

The last significance of this study is that the findings could serve as a base for further studies in the area. That means the findings would motivate other researchers to conduct similar studies with the aim of exploring unaddressed issues while contributing to the body of knowledge regarding the banking sector of the country and the financial sector as a whole.

1.6. SCOP AND LIMITATION OF THE STUDY

The research covers a period of thirty six years (i.e., from 1981 to 2016). The findings of the study are only useful to generalize about the banking sector contribution to economic growth, but not the financial sector as whole. But, in Ethiopia, if financial sector development has to bring economic growth, it is mainly because of the banking sector since other part the financial sector remained relatively undeveloped.

Another, more general limitation, common for finance-growth studies, is the fact that financial sector induce long-run economic growth by reducing information and transaction costs and monitoring borrowers; however, researchers do not possess appropriate measure on how well a financial sector provide these service to the economy (Demirguc-Kunt and Levine, 2008). Thus, similar shortcomings are also observed in this study.

1.7. ORGANIZATION OF THE STUDY

The remaining part of the research will be organized as follows. The theoretical and empirical literatures related with the subject matter will be discussed in the second chapter, while the research design and methodology to be used will be presented in chapter three. Chapter four will present the findings and conclusion part of the research, while the fifth chapter presents the conclusions and recommendations.

CHAPTER TWO: LITERATURE

This part of the research will present both the theoretical and empirical literature regarding the effects of the role of banks, primarily deposit mobilization and credit expansion, on economic growth of a country. The first part presents the theoretical literature, while the second part presents the findings of empirical literature. Finally, the chapter will wind up by identifying the research gap and developing the conceptual framework of the research.

2.1. THEORETICAL LITERATURE

Economic theory suggests that sound and efficient financial system, which incorporates banks and bond and equity markets that channel capital to its most productive uses are crucial for long-run economic growth. Especially the role of financial sector in economic growth through the efficient capital formation is critical for underdeveloped and capital scarce economies. In similar fashion, the inefficient financial system will bring crisis to the economy. Although, a sudden reversal of inflow of short-run capital contributes to the crisis, weakness and inefficiency of the financial systems in allocating capital to most productive sector of the economy aggravate the crisis. Thus, one can conclude that the financial sector of the economy brings long-run economic growth only when there is sound financial system that can efficiently mobilize and channel financial resources to its most productive uses.

Because of that countries undergo various financial sector reforms in building up a more robust and efficient financial system that would provide the appropriate financial service to a given level of economic development and thereby attain sustainable economic growth. However, both theoretical and empirical literature in this regard lacks consistency on the importance of the financial sector to economic growth. Thus, this part of the research will present arguments that range from those who claim that financial development does not have significant effect on economic growth to those who claimed strong significance.

2.1.1. Finance and Economic Growth Models

I. Neoclassical growth model

Until recently, growth models were highly dominated by the views of Solow model that claims long-run economic growth is independent of the savings rate (Solow, 1957). According to this

model, a permanent increase in labor and saving rate will have a temporary effect on long-term growth rate of output, thus sustainable economic growth can be attained through technological progress or innovation. Therefore, financial market has only minor contribution to the rate of investment in physical capital, and the changes in investment were viewed as having a short-run effect on economic growth.

II. Endogenous growth model

Models that challenged the views of Solow models generally considered as Endogenous growth models. In contrast with the above model, Harrod (1939) and Domar (1946) acknowledged the role of savings in generating growth in their growth model. According to this model an economy to be on an equilibrium growth path the national savings rate (the fraction of income saved) has to be equal to the product of the capital-output ratio and the rate of growth of labor force. The implication of Harrod-Domar growth model for the financial sector is that doubling the saving rate will have an equal effect on economic growth, except some portion of the savings might used for replacement of obsolete capital goods.

Following the insights of early endogenous growth model by Lucas (1988) and Romer (1990), a number of theoretical papers on finance and growth have emerged. To name few Bencivenga and Smith (1991) and Saint Paul (1992) have modeled the joined emergence of the financial sector alongside the process of economic development. Currently, various studies have incorporated the role of financial sector in the endogenous growth model. Pagano (1993) identified the following three channels through which the financial development affects growth: (1) raising the efficiency of financial intermediation, (2) increasing the marginal return on capital, and (3) influencing the rate of private savings. The stronger financial system can lift growth by boosting the aggregate saving rate and investment rate, speeding up the accumulation of physical capital.

Based on the above arguments one shall question how the financial sector development affects growth? Is that through the channel of capital accumulation, as the case in old growth theory or through the channel of productivity increases engendered by knowledge creation, as the case in endogenous growth theory? In this regard, Benhabib and Spiegel (2010) figured out that financial sector development promotes both capital accumulation and productivity growth.

2.1.2. Financial Structure, Capital Accumulation, and Economic Growth

There is a vast body of literature devoted to analyzing the relative advantages of different forms of the financial structure; however, taken as a whole, the existing research has not reached an agreement on the strengths and weaknesses of various types of financial structure in promoting economic growth (Lin et al., 2009). For the purpose of this research, the relationship between financial structure and economic growth can be discussed on the basis of competing theories of financial structure, namely bank-based, market-based and financial service view.

The apologist of bank-based financial system argued that banks are better in mobilizing savings, identifying good investment and exerting sound corporate governance, especially during early stages growth and development and in a weak institutional environment. Thus, financial markets are at disadvantage in terms of alleviating informational asymmetry and therefore a financial system with a bank-based structure should perform better in allocating resources and promoting economic development. However, banks by their very nature are cautious which might stymie innovation and impede economic growth.

The proponent of market-based financial system argued that financial markets (bond market and stock market) are better in allocating capital, providing risk management tools and mitigating the problem associated with excessively powerful banks (Levine and Zervos, 1998). Particularly, powerful banks can stymie innovation by extracting information rent and protecting established firms. Therefore, the apologists of market-based view stress that markets will reduce the inherent inefficiencies associated with banks and thereby facilitate economic growth.

In contrast with the above arguments, Merton and Bodie (1995) provide a financial service view that minimizes the importance of bank-based versus market-based argument. According to this view financial sector developed to improve market imperfections and provide financial services. That means, any financial arrangements arise to address potential investment opportunities, exert corporate control and savings mobilization. Thus, any form of financial arrangement that can provide this function efficiently will promote economic growth. In financial service view, the focus will be then on how to create a favorable environment in which intermediaries and markets provide a sound financial service to the economy.

In light of the above argument, La Porta et al. (1998) provides law and finance view which is a special form of financial service view that can be applied to the bank-based and market-based views. The above authors claimed that the financial structure of an economy is highly dominated by the legal system. According to this view countries with common law (e.g., England) are more likely to have a market-based financial system, while civil law countries (e.g., German) are more likely to have a bank-based financial system. Common law countries tend to stress the rights of minority shareholders with beneficial implications for securities market, while civil law countries opt for financial intermediaries over markets since the system ease terms of the debt contract. Therefore, even if each institutional arrangement has its own pros and cons the legal system of the country has a significant effect on the efficiency of the financial sector in mobilizing saving and allocating capital which ultimately affects long-term economic growth.

2.1.3. Financial Sector, Capital Formation and Economic Growth

Theoretical literature in the finance-growth nexus identified five basic functions of financial sector that have a positive effect on economic growth. These are: saving mobilization, facilitate the trading, diversification & risk management, acquiring information about potential investment opportunities and allocate capital, monitoring borrowers and exerting corporate controls after providing finance, and ease the exchange of goods and services. Therefore, the financial sector is said efficient if it performs well these core functions, and developed if it has improved the efficiency.

The financial system mobilizes savings from surplus units of the economy for investment. This activity involves the collection of small household investment and creates a large pool of savings that can finance large projects which cannot be done with small sources of funds. Financial intermediaries and markets can perform this. The main thing here is that the financial system should create a larger pool of savings that can lead to higher level of aggregate investment, faster rate of capital accumulation and hence faster level of economic growth. As mentioned in the background of the study, this function of the financial sector was significantly contributed to regional economic growth disparity between Latin America and Asian countries. Besides, it is clear that saving mobilization role of the financial sector is highly critical for counties at early stage of economic growth process, lower income and capital scarce.

An economy requires a financial system that better manages risks. For this reason, a well developed financial system provides financial instruments, institutions, and markets that efficiently facilitate the trading, hedging and pooling of risks across firms and industries. By doing so, the financial system will direct the flow of financial resources or capital into its more productive sector of the economy. This is true because many individuals might be risk averter, but through the financial sector, individuals can diversify risks so that capital diverted to high-risk high-return investments. The risk diversification role of the financial sector has a positive implication on innovation since risk-avert individuals are more likely to invest in a portfolio of new technologies than a single new technology.

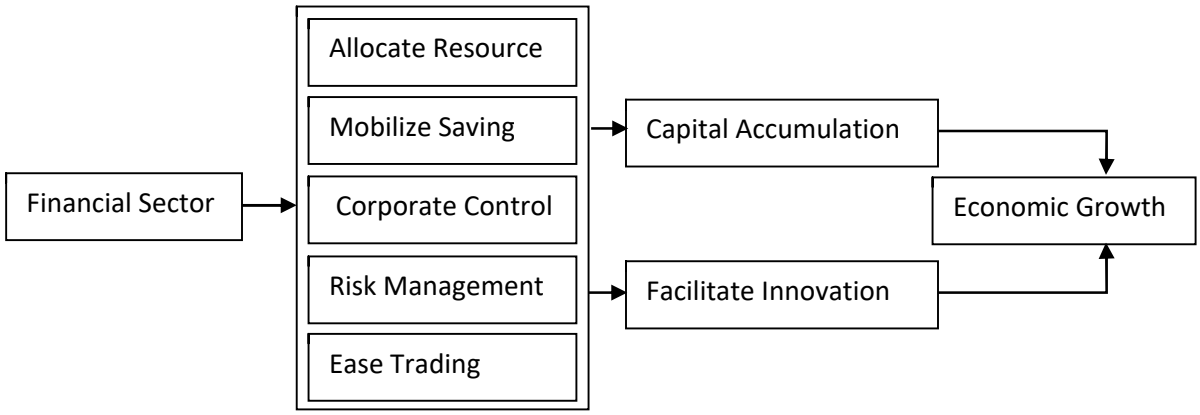
The financial sector of an economy significantly contributes to the economy by minimizing the cost of acquiring information about potential investment opportunities. The intermediation of savings into investments is highly dependent on the quality of information available to market participants, but it is costly to individuals or may not have the capacity to collect and process information regarding the environment that affects return. In this case, financial intermediaries like banks can collect process & produce information in an efficient manner than do individuals. With this quality information, financial institutions will invest in most promising firms and industries so that assured efficient financial resource allocation.

In addition to the above ex-ante role, the financial system has also the capacity to exert corporate control over institutions received finance. The financial arrangements that promote corporate control will facilitate saving mobilization, capital accumulation, resource allocation, and growth. For instance, investors are required to verify the viability of projects; however, it is costly. This requires the development of financial institutions that can provide a debt contract optimal for insiders and outsiders. If not, the verification cost that investors should pay hinder investment decisions and reduced economic efficiency. Besides, if there is an established relationship between firms and financial intermediaries cost of acquiring information would be minimal and information asymmetry would be ease, which in turn minimize external financing constraints and facilitate better resource allocation (Sharpe, 1990). Therefore, financial arrangements that can improve corporate control tend to promote faster the capital formation and economic growth by improving the efficiency of capital allocation (Khan, 1994).

According to Estrada et al. (2010), at a more fundamental level, the financial system can arouse specialization, innovation, and growth by reducing transaction costs. Similar to the 1976 Adam Smith's division of labor, lower transaction costs would permit greater specialization since it has required more transactions. The transition from a barter economy to a monetary economy brings about a quantum leap in efficiency and welfare as a result of the three basic functions of money as a means of payment, the unit of account and store. By reducing the transactions costs of economic exchange and activity, money enables workers to specialize in specific activities. This, in turn, improves the capacity of workers to create new technologies and products. The end result of increased specialization and innovation is faster economic growth. The decline in transactions costs does not stop with the introduction of money but will continue as long as there is financial innovation. According to Estrada et al. (2010), credit cards and automated teller machines are but two examples of financial innovation that have cut transaction costs. Financial innovation that reduces the cost of economic activity will spur further specialization and innovation and thereby contribute to economic growth.

In general, as depicted in figure-1, the financial sector efficiently performing the aforementioned role facilitates long-run growth since it speed up the rate of capital formation and technological innovation. That is why the findings of many researchers recommend policymakers to focus on improving the efficiency of the financial sector so as to secure sustainable economic growth.

Figure 1: Theoretical framework on how financial sector development contribute to growth



Source: Robinson, 1952; Levine, 1997; and Theil, 2001

2.2. EMPIRICAL LITERATURE

This part will discuss the findings of various empirical studies that provide a clear picture of the subject matter and enable to identify the literature gap which is the essence of this research.

2.2.1. The role of Bank in Capital Accumulation and Economic Growth: Cross-country study

In an effort to identify the effect of gross capital formation on economic growth Pavelescu (2008) investigate EU-member and candidate states. Based on data collected for the period 1999 to 2006, the study concludes that gross capital formation contributes to sustainable growth not only on the demand-side but also on the supply-side because an important part of government expenditures are dedicated to the renewal of the firms' fixed capital. The study recommended that long-run economic growth model shall be viewed from three types of capital, namely fixed, infrastructure and human capital.

A research made by taking panel data from thirty five developing countries over the period 1970 to 2003 identified that the financial development affects per capital GDP primarily through its role of efficient resource allocation than its effect on capital accumulation. This research was aimed to investigate the role of financial development, domestic and foreign capital in economic growth through capital accumulation and total factor productivity growth. The research comes up with more interesting findings: first, domestic capital accumulation is better in rising per worker output and thereby promoting long-run growth than the foreign capital. Second, domestic capital plays a significant role in attracting foreign capital, but foreign capital does not stimulate domestic capital accumulation; and, third, government expenditure facilitate rapid capital accumulation while adversely affecting economic growth due to its detrimental effect on the efficiency of resource allocation (Ahmad and Malik, 2009).

Rioja and Valev (2009), incorporate the effect of financial structure, the stock market and banks, in their investigation of the source of economic growth, productivity and capital formation. Based on their analysis using a large cross-country panel for 1976 to 2004, figured out that the role of banks primarily affects capital accumulation while the stock market primarily affects productivity. More interesting findings of this research is that, in high-income countries, banks and stock market have an effect on capital while productivity looks highly benefited from stock

market financing. In contrast, in low-income countries, the role of the bank in credit expansion is the primary source of growth, while stock markets neither encourage capital accumulation or productivity. Therefore, they have recommended that low-income countries shall expand their banking sector for long-term economic growth since, according to Acemoglu (2002), growth in low-income countries primarily emanates from capital accumulation. Yet, Estrada et al. (2010) in their study of the financial sector of Asian developing countries reported that financial structure doesn't matter for growth; thus, apart from economic level, both form financial system (bank-based or market-based) significantly contribute to economic growth.

In related research conducted by Mehrara and Musai (2013) in MENA identified a long-run relationship between investment and economic growth. Based on their co-integration analysis, investment does not bring long-term economic growth. Thus the causality runs from economic growth to investment/capital accumulation, not vice versa. Accordingly, countries are advised to increase total factor productivity in order to boost capital accumulation. However, research made in SSA countries identified a bi-directional relationship between economic growth and capital accumulation (Uneze, 2013). According to this research capital accumulation measured either as private fixed capital or gross fixed capital will have a significant effect on short-run and long-run economic growth of 13 SSA countries included in the sample.

Most recent research by Petkovski and Kjosevski (2014), based on data collected from 16 central and South Eastern Europe, provide a contradicting finding. According to this study, the financial sector development has an adverse effect on economic growth. This might be accounted for the large stock of NPL and banking crisis experienced in the region during 2008 and 2010. In contrast with the above finding, Ragonmal (2015) identified a significantly positive relationship between commercial banking sector growth and long-run economic growth, while studying the Vanuatu economy. Both researches were used same proxy as a measure of financial sector development (i.e., bank credit to the private sector), but the latter with lagged two years.

In general, it can be concluded that the financial sector development plays a significant role in long-run economic growth through rapid capital accumulation and efficient resources allocation, despite some variation across regions that can be accounted for the difference in income level, proxy used, financial sector soundness, financial sector structure and the like.

2.2.2. The role of Banks in Capital Accumulation and Economic Growth-Country study

In an effort to determine the role of commercial banks in capital formation and economic growth, Omankhanlen (2012) investigates the Nigerian banking sector using data for the period 1980 to 2009. Based on the OLS regression analysis commercial banks deposit liabilities and investment has a significant effect on nation's gross fixed capital formation, but credit expansion has the only significant effect on economic growth not on capital formation. Interestingly, banks' deposit liability has the only immediate impact on capital formation not on economic growth. Besides, consistent with the finding of Kanu et al. (2014) and Shuaib and Dania (2015), capital formation has a strong and positive relationship with economic growth. In general, the research concludes that the role of banking sector significantly contributes to Nations' gross fixed capital formation and thereby fostering long-term economic growth.

Related research was also conducted in Nigeria by Akinola and Omolade (2013) with the aim of identifying the relationship between Saving, Gross fixed capital Formation & economic growth. Based on their analysis GDP has a stronger effect on gross national savings and gross fixed capital formation than vice versa. Besides, they have identified a bidirectional relation between the three variables; that is, GDP and GCF, GDP and GNS, and GNS and GCF. Thus the research has recommended that countries should harmonize macroeconomic policies, accelerate the growth of capital formation and grass root saving mobilization for the sake of economic growth.

A most recent study by Jagadeesh (2015) has also investigated the effect of saving on economic growth of Botswana. Consistent with the Harrod-Domar growth theory, this research has identified a significant impact of gross national saving, gross fixed capital formation and export on the nation's long-term economic growth. Since saving mobilization is the channel through which capital accumulation is transmitted to accelerate economic growth of Botswana, The study provides two policy directions: one, effort shall be in place to mobilize saving in a consistent manner and divert it to the most productive sector of the economy; and, two, government should take the appropriate measures to increase the level of export.

Other groups of studies have investigated the role of financial sector in economic growth without considering the channels (i.e., capital accumulation and resource allocation) through which it would attain. In this regard, Timsina (2014) assessed the impact of banking sector credit on

Nepalese economic growth. Based on time series data collected for the period 1975 to 2013, banking sector credit has the only long-term effect on growth; nevertheless, in short-term, it has been observed a feedback effect from economic growth to private sector credit. In a similar study, bank credit is also much contributed to the economic growth of Romania (Duican and Pop, 2015). Thus, it can be suggested that countries shall build up their banking sector in a way that could provide finance to various economic activities in order to bring sustainable growth.

Earlier in the above study, Iqbal et al. (2012) were tried to identify the impact of saving and credit on economic growth of Pakistan. Based on their time series data for the period of 1973 to 2007, the research identified that credit to private sector and gross national saving is significantly contributed to the nation's long-term economic growth. Consistent with this finding, Bal et al. (2016) have also documented a statistically significant and positive relationship between capital formation and short-term and long-term economic growth of India. Therefore, both researchers conclude that capital accumulation has a significant effect on the nations' economic growth.

2.2.3. The role of Bank in Capital Accumulation and Economic Growth: study in Ethiopia

The first researches worth discussing in this connection is Muluneh (2015) and Vankati (2016), who investigate the financial sector of Ethiopia. They analyzed the role of banks deposit mobilization, credit financing, investment and national saving on capital formation. Thus, based on the analysis made using time series data for the period from 1994 to 2014, both researchers conclude that bank deposit and credit, and national saving significantly affect capital formation; but bank investment and real interest rate have no significant impact.

Earlier from the above study, Murty (2012) identified the long-term impact of bank credit on economic growth in Ethiopia. Based on Johansen co-integration approach using time series data for the period 1971/72 to 2010/11, the research comes up with the following findings: one, there is a positive and statistically significant equilibrium relationship between bank credit and economic growth in Ethiopia. Two, the deposit mobilization role of the banking sector, approximated by bank liability, also affect economic growth; and, three, human capital, domestic capital, trade openness positively affect growth, while inflation and government spending have a negative impact. Accordingly, the research recommended policymakers to boost domestic investment which is a precondition for increasing output per capital and then growth.

2.3. SUMMARY AND RESEARCH GAP

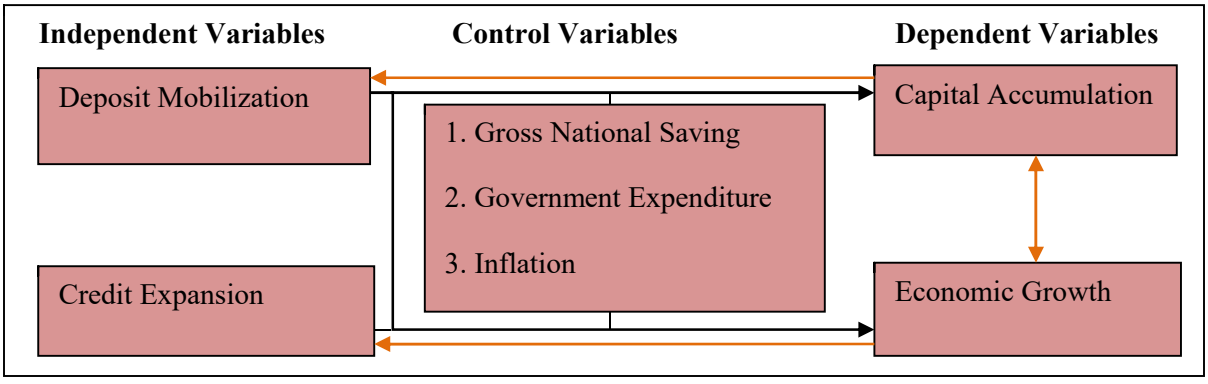
As evidenced by the theoretical literature discussed so far the financial sector development plays a significant role in long-run economic growth. A well developed financial system in the course of efficient deposit mobilization, resource allocation, risk management and corporate control will increase rapid capital accumulation and innovation in which long-run economic growth attained. Nonetheless, some argued that the financial structure matter for economic growth. For example, the apologist of bank-based financial system claims that banks are better in saving mobilization, spot potential investment and exert corporate control; while the proponent of market argued that market is better in capital allocation and risk management. In this regard, financial service view minimizes this argument and claims that the financial system promotes economic growth when it only provides the financial service that the economy demands at each level of development.

The findings of empirical studies in finance-growth nexus have some inconsistency that could be accounted for countries differ in terms of financial structure, income level and the like. As far as the financial sector of Ethiopia, there is no sufficient study. Therefore, this research is conducted with the aim of identifying the role of the banking sector in capital accumulation and economic growth; while contributing to the above arguments.

2.4. CONCEPTUAL FRAMEWORK OF THE RESEARCH

Based on theoretical and empirical researches that have discussed so far the researchers developed the following conceptual framework that eases understanding on the subject matter.

Figure 2: Conceptual Framework



Source: researcher's own conceptual framework

Note: arrow with orange color indicates the direction of causality

CHAPTER THREE: METHODOLOGY

The purpose of this chapter is to present the research methodology that has used to analyze the effect of the role of banks in capital accumulation and economic growth. The first part presents the research design best fit the research objectives while the second part discussed model specification. The chapter then wind up by identifying where the data source, how analyzed, and presented.

3.1. RESEARCH DESIGN

Researchers choose the appropriate research design that is more comfortable with and competent to handle. For example, according to Bhattacherjee (2012), ground theory and case researchers are best for theory building, while experiments are ideally suited for theory testing; Positivist studies are used for theory/hypothesis testing, while interpretive studies used for theory building; and it is also clear that quantitative designs are meant for theory testing, while qualitative designs are meant for theory development. Thus, of the available research designs, the research will use explanatory-quantitative approach.

A quantitative approach is a way researcher use postpositive claims for developing knowledge (i.e., cause and effect thinking, reduction to specific variables and hypothesis and questions, use of measurements and test of theories), applies strategies of inquiry like experiments and collect data on predetermined instruments that yield statistical data (Creswell, 2002). Thus, the research under consideration will follow this approach. That means quantitative data will be collected for the period 1981 to 2016 and used to test the hypothesis developed.

Therefore, since the research objective is to analyze the effect of the role of banking sector in capital accumulation and economic growth, a well designed quantitative approach has an advantage of making generalizations from the sample. To make the generalization, this approach follows standardized procedures in sample selection, instrument design, implementation, and analysis. Standardization, in turn, enhances the reliability of findings and alleviates the impact of investigator and subjects biases. Despite these advantages, quantitative research design has also limitations: lack flexibility in design, standardization can hinder exploitation of new ideas, and lack interpretive and exploratory examination of a research problem (Creswell, 2003).

3.2. MODEL SPECIFICATION

Theoretically the resource allocation, saving mobilization, corporate control, risk management, and trading roles of the financial sector enhance fixed capital accumulation and technological innovation, which in turn is expected to bring economic growth (Robinson, 1952; Levine, 1997; Theil, 2001). Thus, the study have take two important roles of the financial sector, particularly the banking sector and check whether these roles have significant effect on capital accumulation and long-run economic growth, by taking the case of Ethiopia. In order to perform this, the study has use models similar to Omankhanlen (2012) with some modifications.

Model1: GCF = f(Bank Deposit, Bank Credit, Gross National Saving, Government Expenditure, and Inflation)

$$\mathbf{LnGCF = \alpha + \beta_1 LnBD + \beta_2 LnBC + \beta_3 LnGNS + \beta_4 LnGEXP + \beta_5 LnINF + \varepsilon} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Model 2: GDP = f (Bank Deposit, Bank Credit, Gross Capital Formation, Gross National Saving, Government Expenditure, and Inflation)

$$\mathbf{LnRGDP = \alpha + \beta_1 LnBD + \beta_2 LnBC + \beta_3 LnGCF + \beta_4 LnGNS + \beta_5 LnGEXP + \beta_6 LnINF + \varepsilon} \ldots\ldots\ldots\ldots (2)$$

Where:

LnRGDP = Natural logarithm of Real Gross Domestic Product at time t,

LnGCF = Natural logarithm of Gross Capital Formation at time t,

LnBD = Natural logarithm of Banking Sector Deposit at time t,

LnBC = Natural logarithm of Banking Sector Credit at time t,

LnGNS = Natural logarithm of Gross National Saving at time t,

LnGEXP = Natural logarithm of Government Expenditure at time t,

INF = Inflation rate at time t,

$\mathbf{B_0}$ = coefficient of intercept,

$\boldsymbol{\beta_1}$**-** $\boldsymbol{\beta_6}$ **=** coefficient of independent variables, and **ε =** error Term

3.3. DATA SOURCE AND MEASURMENT OF VARIABLES

DATA SOURCE

As mentioned in the previous part the research uses quantitative data. This data is collected from secondary source (i.e., from published reports of Ministry of Economic Cooperation and National Bank of Ethiopia). Particularly, the macroeconomic data, economic growth, capital accumulation, national saving and government expenditure, collected from annual reports of Ministry of Economic Cooperation and National Bank of Ethiopia (NBE), while bank-specific data namely bank deposit mobilization and bank credit collected from annual reports of NBE.

The banking industry of the country is composed of two state-owned banks and sixteen private commercial banks. The state-owned commercial banks are Commercial Bank of Ethiopia, the largest bank that holds sixty percent of banking sector assets, and development bank of Ethiopia, specialized bank engaged in financing medium and long-term projects, particularly in the agricultural and manufacturing sector. The remaining parts of the sector which composed of private commercial banks, engage in ordinary commercial banking activities, mobilizing savings and extending short-run and long-run credits. The research assessed whether the role of these banks contributes to the country's capital accumulation and economic growth or not, based on data collected for the period 1981 to 2016.

MEASUREMENT OF VARIABLES

The description and measurement of variables used in the research are explained as follow.

i. Economic Growth: as measured by Real GDP (RGDP), is a macroeconomic measure of the value of economic output adjusted for price changes (i.e., inflation or deflation). Although GDP is total output, it is primarily useful because it closely approximates the total spending: the sum of consumer spending, the investment made by industry, the excess of exports over imports, and government spending. Due to inflation, GDP increases and does not actually reflect the true growth in an economy. That is why the GDP must be divided by the inflation rate (raised to the power of units of time in which the rate is measured) to get the growth of the real GDP.

ii. Capital Accumulation: as measured by Gross capital formation, is an economic concept used in national accounts statistics, econometrics and macroeconomics. In that sense, it refers to a measure of the net additions to the (physical) capital stock of a country (or an economic sector) in an accounting interval, or, a measure of the amount by which the total physical capital stock increased during an accounting period.

iii. Deposit mobilization: as measured by banking sector deposit, is the sum of all types of deposit (saving, demand and time) collected by the banking sector.

iv. Credit Expansion: as measured by banking sector credit, includes all form of credits provided by the banking sector to all parts of the economy.

v. National saving: as measured by Gross National Saving, is the sum of private and public savings. It is generally equal to a nation's income minus consumption and government purchase.

vi. Government expenditure: it is the sum of current and capital expenditure.

vii. Inflation: This variable is used as proxy for macroeconomic instability where country inability to control macro environment. It is measured as an annual percentage increase or inflation is a sustained increase in the general price level of goods and services in an economy over a period of time.

Table 1: Variable, Proxy and Expected effect on gross capital formation and economic growth

No.	Variable	Proxy	Expected Effect on GFCF and GDP
1	Real Gross Domestic Product	GDP adjusted for inflation or deflation	
2	Gross Capital Formation	GCF as percentage of GDP	positive
3	Bank Deposit	Bank Deposit as percentage of GDP	Positive
4	Bank Credit	Bank Credit as percentage of GDP	positive
5	Gross National Savings	National Savings as percentage of GDP	positive
6	Government Expenditure	Government Expenditure	positive
7	Inflation	Real Interest Rate as percentage of GDP	positive

Source: Researcher own presentation

3.4. METHOD OF DATA ANALYSIS

Before the analysis, data was first processed in order to identify data needs special or unusual treatments, and then regression analysis made based on ARDL approach to co-integration using time series data collected for the period 1981-2016. The analysis is done using eviews statistical software package. The software have used for assumption tests connected with time series data (i.e., tests of stationary, tests of co-integration, tests of model accuracy, and other econometric assumption tests like Multicolinearity, Heteroskedasticity, and autocorrelation).

Particularly, the model accuracy test is critical in this research since study period covers two political regimes having different economic ideology. Besides, time series data might expose to one or more structural breaks due to structural changes. Thus, the study used the cumulative sum (CUSUM) and cumulative sum of squared (CUSUMSQ) methods as proposed by Brown, et al., (1975). The CUSUM and CUSUMSQ tests are quite general tests for structural change that they do not require a prior specifying the structural breaks dates; whereas, the Chow test requires break point to be specified.

3.4.1. Stationary or non stationary test

The research conducts a unit root test in order to determine the level of stationary. Since the research use a time series data that assumes the underlying time series is stationary, test of stationary becomes mandatory in order to generalize the findings beyond the underlying time period. Thus, a test of stationary is conducted using Augmented Dickey-Fuller (ADF) test and Phillips and Perron (PP) test to avoid spurious regressions (Brooks, 2008).

H0: Variable has unit root or variable is not stationary

H1: Variable does not have a unit root or variable is stationary

Decision: reject the null hypothesis if P-value is less than 5%, so that the variable does not has a unit root or is stationary. A stationary time series is one whose statistical properties such as the mean, variance and auto-correlation are constant over time in order to obtain meaningful statistics and/or avoid spurious regression. Thus, it is important conducting a unit root tests in order to identify if there is a variable stationary at order two (i.e., I (2)) in order to ascertain their order of integration and use the appropriate measure of co-integration (Asteriou, 2006).

3.4.2. Co-integration Analysis

If a group of variables are individually integrated of the same order and if at least one linear combination of these variables are said to be co-integrated. This implies that there could be a long-run equilibrium relationship between the variables. So far the field of econometrics provides three alternative measures of co-integration, Engle-Granger procedure, the Johansen's co-integration procedure, and Autoregressive Distributed Lag (ARDL).

3.4.2.1. Engle-Granger Approach

It is a residual based test of co-integration. In order to use this method, first, we shall make sure that the level of integration should be same order. Then we can proceed to coefficient estimation using ordinary least square and test of co-integration. Second, we can form an ECM where the error correction term is the residual from the co-integrating relationship lagged one time period.

The error correction term communicates the speed at which short-run equilibrium adjusted in the current year. But the method suffers from two critical problems. One, if we have more than two variables, there may be more than one co-integrating vectors. But, it can find out only one co-integrating vector. Two, a co-integration test may depend on the direction of the variable put in the left side of the co-integration. That means, the method doesn't allow the variables in the right hand side to be potentially endogenous (Enders, 1996).

3.4.2.2. Johansen Maximum Likelihood

Johansen method of co-integration is formed in order to overcome some of the shortcomings of the above model. That means, the method can estimate more than one co-integration relationship, if the data set contains two or more time serious variables.

However, since Johansen co-integration techniques require that all the variables in the system to have equal order of integration, i.e., the application of the Johansen technique will fail when the underlying explanatory variables have different order of integration, especially when some of the variables are I(0) (Pesaran, Shin, and Smith, 2001). That means the trace and maximum eigen-value tests may lead to erroneous co-integrating relations with other variables in the model when I(0) variables are present in the system (Harris, 1999).

3.4.2.3. Autoregressive Distributed Lag (ARDL) model

The ARDL model was developed in an attempt to overcome the above shortcomings. This is because the model can be applied irrespective of the order of integration. That means, it only required to make sure that none of the variables/series we are working with are I(2), the research can apply autoregressive distributive lag model (ARDL)/bound testing methodology in order to extract both long-run and short-run relationships. This model was developed by Pesaran and Shin (1999) and Pesaran et al. (2001) to give some advantage over the traditional/conventional co-integration test like Johansen co-integration test which only work for variables having same level of integration, e.g., I(1). The ARDL model can be used with a mixture of I(0) and I(1) variables and gives an opportunity to use different lag-lengths as they enter the model. Besides, the model is relatively more efficient in the case of small and finite sample sizes.

The ARDL model used a two step procedure for estimating the long-run relationship. The first step is to examine the existence of a long-run relationship among the variables, and the second step is to estimate the long-run and short-run dynamics of variables. However, the second step is only run when the first step satisfied, when the existence of long–run relationship is confirmed. Thus, the following ARDL model is specified as proposed by Pesaran and Shin (1997, 1999) and Pesaran, Shin, and Smith (2001).

……. (3)

…..…….. (4)

Where: Δ=difference **LnRGDP**=Natural logarithm of Real Gross Domestic Product, **LnGCF** = Natural logarithm of Gross Capital Formation, **LnBD** = Natural logarithm of Bank Deposit, **LnBC** = Natural logarithm of Bank Credit, **LnGNS** = Natural logarithm of Gross National Saving, **LnGEXP** = Natural logarithm of Government Expenditure at time t, **INF** = Inflation rate at time t, $\mathbf{B_0}$ = coefficient of intercept, $\boldsymbol{\beta_1}$ **-** $\boldsymbol{\beta_7}$ **=** coefficient of short-run variables, $\boldsymbol{\gamma_8}$**-** $\boldsymbol{\gamma_{15}}$= coefficient of short-run variables **ε =** error Term

Based on these models the following hypothesis is tested:

H0: Variables are not co-integrated/have no long-run relationship.

H1: Variables are co-integrated/have long-run relationship.

The decision for reject or fail to reject of the null hypothesis is made based on Wald test F-statistic. In this regard Pesaran et al. (2001) provide two critical values, lower bound value I(0) and upper bound value I(1). Based on this, if the Wald test F-statistic is less than I(0), it can be concluded that there is no co-integration among the variables under consideration. If the value of F-statistic is above upper critical value, I(1), we can reject the null hypothesis of no co-integration; meaning that there is a long-run relationship between the variables.

After confirming the existence of long-run relationship between the variables based on the above model, the next procedure is the determination of stable long-run model using the following model.

...…… (5)

….. (6)

3.4.3. Short-run dynamics and Error Correction Model

If the result of the above model confirms the presence of long-run relationship between the dependent and explanatory variables and identify the coefficient of stable long-run model, then we can proceed to the measurement of short-run coefficients along with error correction term (ECT). This is done by specifying the following Vector Error Correction Model (VECM).

..…… (7)

……. (8)

Where: β_1- β_7 = coefficient of short-run dynamics of the model, φ = coefficient of Error Correction Term lagged one period, $ECT_{(t-i)}$ = Error Correction Term lagged by one period, **N =** represent the optimal lag length of each variable in the ARDL process.

Here the error correction term is derived from the corresponding long-run model whose coefficients are obtained by normalizing the equation. In processing all the models above, there is a diagnostic and model stability test conducted to ascertain the reliability of coefficients.

3.4.4. Granger Causality Test

Determining the direction of causality was the main drawbacks for previous studies conducted in Ethiopia. Thus, the study conduct pair wise granger non-causality test that identify the direction of causality between the role of banking sector, capital accumulation and economic growth. This will enable the study to determine whether finance lead or simply follow economic growth. The test for the absence of granger causality is made by estimating the following VAR model.

…….(9)

…….(10)

Null hypothesis: Ho: = 0 is the test that does not granger causes
Alternative hypothesis: H1: ≠ 0 is the test that does granger causes

In each case the rejection of the null hypothesis implied that there is granger causality between the variables. In general there are four possible outcomes from test of Granger-causality:

i. Unidirectional Granger causality runs from to ,
ii. Unidirectional Granger causality runs from to ,
iii. Bidirectional Causality runs from to , and to , or
iv. No causality.

CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION

4.1. DESCRIPTIVE STATISTICS

Before diving into the econometric analysis, it is worth discussing the descriptive statistics of the variables used in the research. Thus, table 2 below present summary of descriptive statistics of two dependent variables (i.e., Economic Growth and Gross Capital Formation), two explanatory variables (i.e., Banking Sector Deposit and Credit), and three control variables (i.e., Gross National Saving, Government Expenditure, and Inflation). The descriptive statistics includes the mean, median, maximum, minimum, standard deviation of variables included in the research for the period 1981 to 2016.

Table 2: Summary of Descriptive Statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
Real Gross Domestic Product	5.695458	7.688030	13.53407	-8.791700	6.101533	36
Gross Capital Formation	0.265680	0.254731	0.428910	0.133601	0.073687	36
Banking sector Deposit	0.147414	0.102757	0.586307	0.016790	0.151500	36
Banking Sector Credit	0.036760	0.022669	0.117787	0.004238	0.035190	36
Gross National Saving	0.240761	0.243836	0.350463	0.105691	0.067768	36
Government Expenditure	0.104364	0.073563	0.365217	0.020947	0.091960	36
Inflation	8.967352	7.097201	55.24131	-11.82320	13.84972	36

Source: Author's computation using Eviews-8

As we can see from the above table, the mean, minimum, and maximum value of real GDP is 5.7%, -8.79%, and 13.53% respectively; with standard deviation of 6.1% that indicates presence of higher variation in economic growth. The mean value of Gross Capital Formation is 26.57% which is close to the minimum requirement for sustainable economic growth.

Regarding bank related variables, the average, minimum and maximum value of banking sector deposit, as measured by the amount of credit provided by banking sector of the economy in proportion to real GDP, is 14.74%, 1.68%, and 58.63% respectively. The corresponding standard deviation of 15.15% indicates the presence of higher degree of variation in mobilizing deposit during the period. The average, minimum and maximum value of credit, as measured by the amount of total credit provided by banks operate in Ethiopia in proportion to real GDP, is 3.68%, 0.4%, and 11.78% respectively.

The research use three control variable: Gross National Saving, Government Expenditure, and inflation. The mean, minimum, and maximum value of Gross National Saving is 24.08%, 10.57%, and 35.04% in proportion to real GDP respectively. The average value of government Expenditure is account 10.44% of the real GDP, which ranges from a minimum of 2.1% and a maximum of 36.52%. Whereas the average value of inflation, as measured by consumers' price index, is 8.97%. The rate of inflation ranges from a minimum of -11.82% to a maximum of 55.24%. The standard deviation 13.85% indicates that the macro-economy has experienced significant instability.

4.2. STATIONARY AND NON-STATIONARY TEST/UNIT ROOT TEST

Before proceeding to the ARDL/bound test, it is a precondition to verify the stationary status of all variables to determine their order of integration and ensure that variables are not integrated of order two I(2). Since lack of stationary of a series leads to an inappropriate statistical result and misleading inference, a unit root testing is conducted to determine the level of stationary or to make sure whether there is a unit root or not; so that the research can apply the appropriate procedure for measurement of co-integration. This is done using the standard Augmented Dickey-Fuller (ADF) test and Philip-Peron test (PP) for three alternatives: first with intercept and no trend (I); second, with both intercept and trend (IT), and third with no intercept and no trend (N) (see, Table 3).

Table 3: Unit root test (Augmented Dickey-Fuller test (ADF) and Phillips-Perron test (PP)

Variables of Interest	ADF-I		ADF-IT		ADF-N		PP-I		PP-IT		PP-N		Decision
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
LnRGDP	1.00	0.00	0.97	0.00	1.00	0.48	1.00	0.00	0.98	0.00	1.00	0.01	I(1)
LnGCF	0.98	0.00	0.53	0.00	0.99	0.00	1.00	0.00	0.64	0.00	1.00	0.00	I(1)
LnDEP	1.00	0.00	0.99	0.00	1.00	0.23	1.00	0.00	0.99	0.00	1.00	0.26	I(1)
LnCR	0.99	0.00	0.24	0.00	0.99	0.00	0.99	0.00	0.23	0.00	0.99	0.00	I(1)
LnGNS	0.89	0.02	0.09	0.01	0.96	0.00	0.97	0.00	0.10	0.00	1.00	0.00	I(1)
LnGEXP	1.00	0.00	0.98	0.00	1.00	0.00	1.00	0.00	0.98	0.00	1.00	0.00	I(1)
INF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	I(0)

Source: Author's computation using Eviews-8

Note: Schwarz information criterion (SIC) is used to determine the lag length while testing the stationary of all variables using ADF. The rejection of the null hypothesis is based on MacKinnon (1996) critical value.

The result of this test shows that, except inflation, all variables of interest are non stationary in their levels for all alternatives and for both methods; however, they become stationary at their first difference I(1). Inflation is the only variable which becomes stationary at level I(0) and requires special treatment. The existence of mixed level stationary (i.e., I(1) and I(0)) call for the application of ARDL approach which has special advantage over the traditional method of co-integration analysis. Therefore, among others, this is one of the main justification for applying ARDL or Bound test approach of co-integration measurement.

4.3. ARDL/BOUND TEST OF CO-INTEGRATION FOR CAPITAL ACCUMULATION

The first step in the ARDL approach to co-integration is the estimation of long-run model specified in equation (3) of chapter three using the appropriate lag length which is selected based on lag selection criteria. Here, the research use lag order of one as recommended by different lag selection criteria, i.e., Akaike information criterion (AIC), Schwarz information criterion (SC), Hannan-Quinn information criterion (HQ), and others (see, Annex-3). Then Wald test is performed to check the joint significance of long-run coefficients and determine the existence of co-integration or long-run relationships among variables. This is done by imposing restrictions on the estimated long-run coefficient of gross capital formation, banking sector deposit, banking sector credit, gross national saving, and government expenditure. The F-statistic value of Wald test then compared with the lower bound and upper bound critical values for unrestricted intercept and no trend of Pesaran et al. (2001) (see, Table 4 and Annex-1).

Table 4: Wald test statistics

Description	at 5% level	
	Lower Bound, I(0)	**Upper Bound, I(1)**
Pesaran et al. (2001) critical value for K=5	2.62	3.79
Research output Wald F-statistic for K=5	3.91	

Source: Pesaran, Shin, and Smith (2001) and Author's computation using Eviews-8

As revealed in Table-4, the computed value of F-statistic (i.e., 3.91) is greater than the Pesaran et al. (2001) upper bound value (i.e., 3.79) at 5% level of significance. This leads to reject the null hypothesis of there is no co-integration among variables. This implies that there is a statistically significant long-run relationship between the dependent and explanatory variables, namely gross capital formation, banking sector deposit, banking sector credit, gross national saving and government expenditure.

In order to check the performance of ARDL model, the research employed the following two groups of statistical tests. Now, before proceeding to the estimation of long-run coefficient and short-run dynamics, it is important to analyze the performance of the ARDL model using the following diagnostic tests.

Table 5: Long-run diagnostic tests

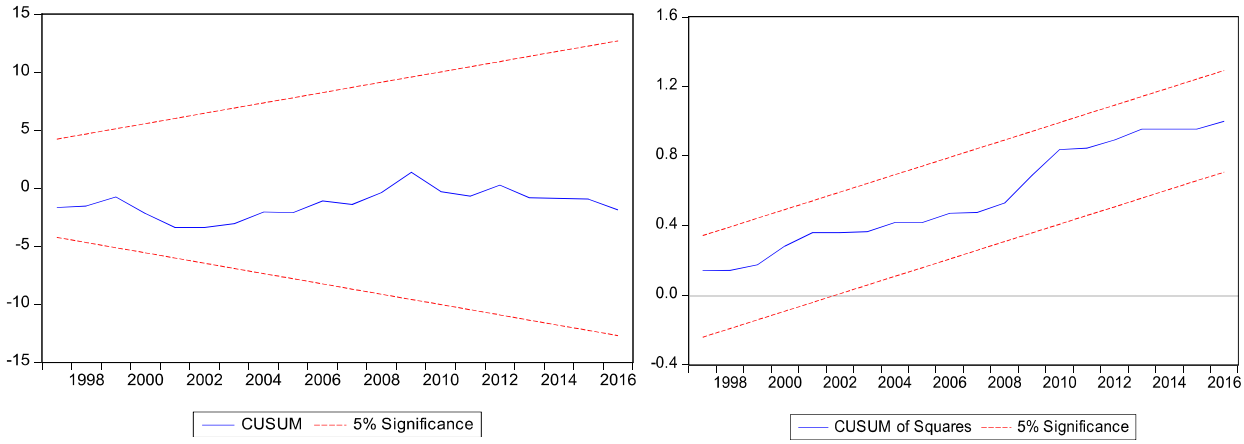
Description	Probability
Jarque-Bera Normality Test:	0.6267
Breusch-Godfrey Serial Correlation LM Test:	0.8458
Breusch-Pagan-Godfrey Heteroskedasticity Test:	0.3153

Source: Author's computation using Eviews-8

As we can see from table 5 above, there is no statistical evidence showing the presence of statistical problems. So we can conclude that errors are normally distributed, and not serially correlated. Besides, there is no problem of Heteroskedasticity.

In addition to the above diagnostic test, the study employed the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMQ) model stability test is conducted to make sure that the equation is correctly specified and the model is stable.

Figure 3: (a) plot of cumulative sum of recursive residuals and (b) plot of cumulative sum of squares of recursive residuals.



(a) (b)

Source: the author using Eviews-8

Note: the Straight line represent critical bounds at 5% significance level

As can be seen from figure 3(a) and (b) above, it can be concluded that the ARDL model used to estimate the existence of long-run relationship is stable. This is because the blue line is between the two red lines. In the case of figure 3 (b), in addition to being within the red lines, the blue lines doesn't cross the critical line. Furthermore, the CUSUM and CUSUMQ test confirms that there was no structural instability in the model during the sample period. So that, the decision made about the existence of long-run relationship among gross capital formation, banking sector deposit and credit, gross national saving, government expenditure, and inflation is reliable.

4.3.1. Long-run coefficient estimation of Capital Accumulation

Following the decision of the existence of co-integration, now we can proceed to estimate the coefficient of long-run relationships which was specified in equation (5) of chapter (3). The empirical result conducted for long-run relationship using bound test approach is reported below after normalizing on gross capital formation (LnGCF) (see, Table 6 and Annex-2).

Table 6: Estimated long-run coefficients using ARDL (1,1,1,1,1,1)

Dependent Variable: LnGCF				
Explanatory Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	1.611574	0.530359	3.038650	***0.0065
LnDEP(-1)	-0.53908	0.252758	-2.13279	**0.0455
LnCR(-1)	0.043239	0.102260	0.422828	0.6769
LnGNS(-1)	0.122425	0.238716	0.512846	0.6137
LnGEXP(-1)	1.105675	0.368300	3.002103	***0.0070
INF(-1)	-0.003870	0.001888	-2.047050	*0.0540

Source: Author's computation using Eviews-8
Note: the stars, ***, **, and *, indicates a 1%, 5%, and 10% level of significance respectively.

The long-run impact of the role of banking sector on Capital Accumulation

Banking sector deposit: based on the t-statistic, the negative and statistically significance effect of deposit on gross capital accumulation of the country is not consistent with the hypothesis. As evidenced from the output of regression analysis conducted using ARDL approach, deposit has significantly negative effect on the nation's capital accumulation with a coefficient of -0.53908. This implies that, holding other things constant, in the long-run, a 1% increase in deposit will leads to about 53.91% decrease in gross capital formation. The P-value (i.e., 0.0455) enable the study to reject the null hypothesis of no effect at 5% level of significance.

This finding is not consistent with previous studies. Nwaeze et al. (2012), Muluneh (2015) and Venkati (2016), for instance, report that greater bank deposit will leads to greater availability of investment fund which will leads to greater productivity and higher growth of capital formation to the economy. But, the banking sector may not be in a position to generate sufficient deposit which the economy required for capital accumulation, which is a precondition for growth.

Banking sector credit: based on the t-statistic, the positive and statistically not significant effect of credit on capital formation is not consistent with the hypothesis. As evidenced from output of regression analysis made using ARDL approach, credit has insignificantly but positive effect on the nation's capital accumulation with a coefficient of 0.0432 and P-value of 0.6769. As a result the study fails to reject the null hypothesis of no long-run relationship exists between banking sector credit and capital formation. Although it has positive impact, credit that the commercial banks disbursed to the economy doesn't appear as having significant effect to capital formation.

This finding is not consistent with what Levine (1996) identified. According to them a financial system is a good predictor of future rates of economic growth, capital accumulation and technological change that are a precondition for long-run economic development. However if the financial sector is not in a position to affect the rate of capital accumulation, which might be the case of us, either by changing the saving rate or by re-allocating saving among capital producing technology, their role becomes insignificant.

The long-run impact of National Saving, Government Expenditure & Inflation on Capital Accumulation

Gross National saving: among control variables, the research fails to reject the null hypothesis of no long-run relationship exists between gross national savings and gross capital formation. In line with this, Gebeyehu (2010) finds no statistically significant causality between savings and investment in either direction. The work of Cyrille (2010) identified national saving as having no significant effect on investment while studying the causality based on 15 SSA countries. Similarly, Cooray and Sinha (2005) identified that out of twenty SSA countries which include Ethiopia, investment and saving were not correlated.

Government Expenditure: In contrast to national saving, the research reject the null hypothesis of government expenditure have no positive and significant effect on gross capital formation at 1% significance level. Even if the coefficient seems exaggerated the role of government in various economic sectors is critical. As Perkovski and Kjosevski (2014) claims one possible reason for this anomaly might be the fact that the level of domestic capital market development and the role of banking sector in capital accumulation and economic growth is still in its infant stage. Thus, government interventions become necessary.

Inflation: With regard to inflation the research reject the null hypothesis of no effect, at 10%, and identified as having significant and negative effect on the nation capital formation. But, the degree of impact is minimal since it has lower coefficient (-0.0039); that means, a 1% increase in inflation has only about 0.0039% decrease in capital formation of the country. One possible reason for this might be the fact that inflation was remained at reasonably lower until 2002/03, although the rate increased to 36.4 percent in 2009, which primarily emanates from food items that affect the wellbeing of the society than damage the macroeconomic condition (Abel, 2016).

4.3.2. Short-Run Error Correction Model for Capital Accumulation

Following the acceptance of co-integration and its long-run equation for gross capital formation, now it's time for computing the error correction term that provide significant information about the speed of adjustment towards long-run equilibrium (see, Table 7).

Table 7: Estimated short-run coefficients using ARDL (1,1,1,0,1)

Dependent Variable: D(LnGCF)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.023917	0.01765	-1.355076	0.1875
D(LnGCF(-1))	-0.194508	0.122863	-1.583124	0.1260
D(LnDEP(-1))	0.937227	0.262581	3.569281	***0.0015
D(LnCR(-1))	0.194804	0.087893	2.216377	**0.0360
D(LnGNS)	0.535936	0.065661	8.162133	***0.0000
D(LnGEXP(-1))	-0.281145	0.156341	-1.798285	*0.0842
INF(-1)	-0.001314	0.000594	-2.210017	**0.0365
ECT(-1)	-0.606066	0.260976	-2.322307	**0.0287

Source: Author's computation using Eviews-8

Note: the stars, ***, **, and *, indicates a 1%, 5%, and 10% level of significance respectively.

As it can be seen from Table 7, the error correction term is negative and statistically significant. The negative coefficient indicates that 60.61% of shocks happened in the previous period will be adjusted towards the long-run equilibrium in the current period; so that it only took less than one and half year for complete adjustment. The higher rate (i.e., 60.61%) also confirms the existence of stable long-run relationship between Capital Accumulation and explanatory variables (bank deposit and credit, national saving, government expenditure and inflation).

The short-run impact of role of Banking Sector on Capital Accumulation

Banking sector deposit: unlike its long-run effect saving mobilization has significantly positive effect on gross capital formation. As evidenced from the output of regression analysis, deposit has significantly positive effect on the nation's capital accumulation with a coefficient of 0.9372 and P-value of 0.0015. This implies that, holding other things constant, in the short-run, a 1 % increase in deposit will leads to about 0.9372% increase in capital accumulation. The P-value (0.0015) enables the study to reject the null hypothesis of no effect at 1% level of significance.

Banking sector credit: unlike its long-run effect credit expansion role of banks has significantly positive effect on capital accumulation. As evidenced from output of regression analysis, credit has significantly positive effect on the nation's capital accumulation, with a coefficient of 0.9372 and P-value of 0.0360. This implies that, holding other things constant, in the short-run, a 1 %increase in deposit will leads to about 0.1948% increase in capital formation. The P-value (0.0360) enables the study to reject the null hypothesis of no effect at 5% level of significance.

The short-run impact of National Saving, Government Expenditure & Inflation on Capital Accumulation

Gross National saving: unlike its long-run effect gross national saving has significantly positive effect on the country's capital formation. As evidenced from output of regression analysis, credit has significantly positive effect on the nation's capital accumulation with a coefficient of 0.5359 and P-value of 0.0000. This implies that, holding other things constant, in the short-run, a 1% increase in gross national saving will leads to about 0.5359% increase in capital formation. The P-value of (0.0000) enables the study to reject the null hypothesis at 1% level of significance.

Government expenditure: unlike its long-run effect, government expenditure has significantly negative effect on the country's capital formation. As evidenced from the regression analysis, government expenditure has statistically significant and negative effect on capital formation with a coefficient of 0.2812. This implies that, holding other things constant, in the short-run, a 1% increase in government expenditure will leads to about 0.2812% cut in capital formation. The P-value of (0.0842) enables the study to reject the null hypothesis at 10% level of significance.

Inflation: like its long-run effect inflation has significantly negative effect on capital formation. As evidenced from output of regression analysis, inflation has statistically significant and

positive effect on capital formation with a coefficient of 0.5359. This implies that, holding other things constant, in the short-run, a 1% increase in inflation will leads to about 0.5359% decrease in capital formation. The P-value (0.0365) enables the study to reject the null hypothesis at 5% level of significance.

4.3.3. Diagnostic test for Short-run Error Correction Model Estimates

Like, as we did for long-run model, diagnostic test is conducted to check the trust worthiness of the short-run model. As revealed in Table 8 below, the model applied to estimate the short-run coefficients is free from statistical problems; that means, errors are normally distributed, are not serially correlated, and there is no Heteroskedasticity problem.

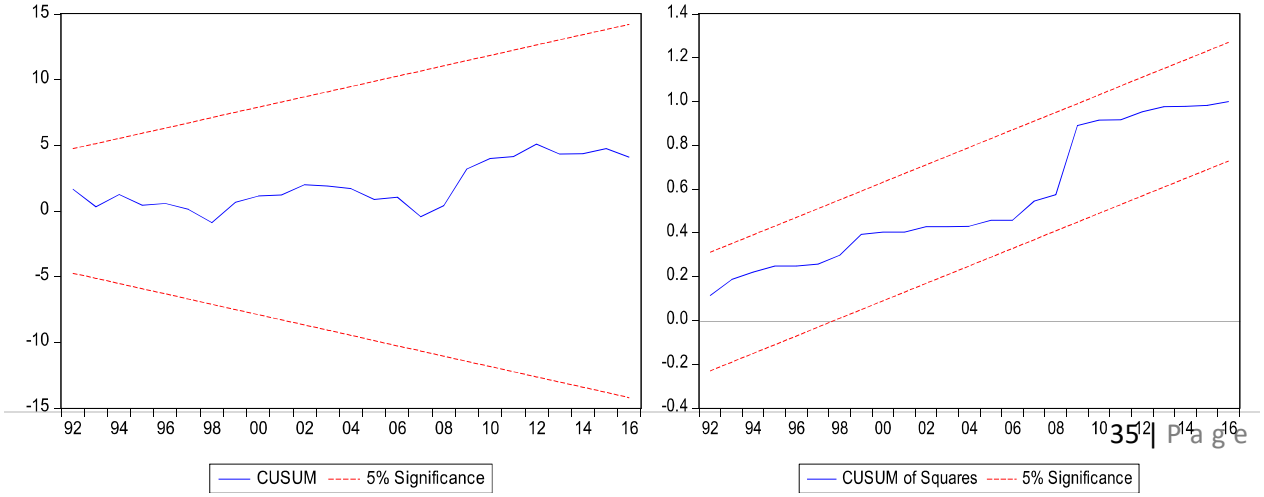
Table 8: Short-run diagnostic tests

Description	Probability
Jarque-Bera Normality Test:	0.3765
Breusch-Godfrey Serial Correlation LM Test:	0.2416
Breusch-Pagan-Godfrey Heteroskedasticity Test:	0.3579

Source: Author's computation using Eviews-8

As can be seen from Table 8 above, the research fails to reject three null hypotheses at 5% level of significance; so that, error terms are normally distributed, not serially correlated and there is no problem of Heteroskedasticity. In addition to the above diagnostic test, model stability test using cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMQ) is also conducted to make sure that short-run coefficients are reliable and efficient, as recommended by Pesaran et al. (2001).

Figure 4: (a) plot of cumulative sum of recursive residuals and (b) plot of cumulative sum of squares of recursive residuals



(a) (b)

Source: the author using Eviews-8

Note: the Straight line represent critical bounds at 5% significance level

As revealed from figure 4 above, the blue line is between the two red lines or don't cross the critical red lines during the period under consideration; so that we can confidently use the estimated coefficients, i.e., they are reliable and efficient. Furthermore, these tests confirm that there was no structural instability in the model during the sample period. So that, the decision made about the existence of long-run relationship between dependent and explanatory variables is reliable.

4.4. ARDL/BOUND TEST OF CO-INTEGRATION FOR ECONOMIC GROWTH

Like, what we have did for gross capital formation, the first step in the ARDL approach of co-integration is the estimation of long run model for economic growth specified in equation (4) using the appropriate lag, which is identified based on the lag length selection criterion. The research use lag order of two as recommended by Akaike information criterion (AIC) (see, Annex-6). Then Wald test is performed to check the joint significance of long-run coefficients and determine the existence of co-integration. This is done by imposing restrictions on the estimated long-run coefficient of real gross domestic product, banking sector deposit and credit, gross capital formation, gross national saving and government expenditure. The F-statistic value of the Wald test then compared with the lower bound and upper bound critical values for unrestricted intercept and no trend of Pesaran et al. (2001) (see, Table 9 and Annex-4).

Table 9: Wald test statistics

Description	at 1% level		at 5% level	
	Lower Bound, I(0)	Upper Bound, I(1)	Lower Bound, I(0)	Upper Bound, I(1)
Pesaran (2001) critical value for K=7	2.32	3.5	2.96	4.26
Research output Wald F-statistic for K=7		7.48		

Source: Pesaran, Shin, and Smith (2001) and Author's computation using Eviews-8

As revealed on Table 9, the computed value of F-statistic (i.e., 7.48) is greater than the Pesaran et al. (2001) upper bound at 1% level of significance. This leads to reject the null hypothesis of

no long-run relationship exist among variables; that means, there is a statistically significant co-integration or long-run relationship between economic growth, banking sector deposit and credit, gross capital formation, gross national saving, government expenditure and inflation.

As we did in the previous section, it is important to conduct a diagnostic test before proceeding to the estimation of long-run coefficient and short-run dynamics of economic growth as specified in equation (4) of chapter (3).

Table 10: Long-run diagnostic tests

Description	Probability
Jarque-Bera Normality Test:	0.5132
Breusch-Godfrey Serial Correlation LM Test:	0.1951
Breusch-Pagan-Godfrey Heteroskedasticity Test:	0.5052

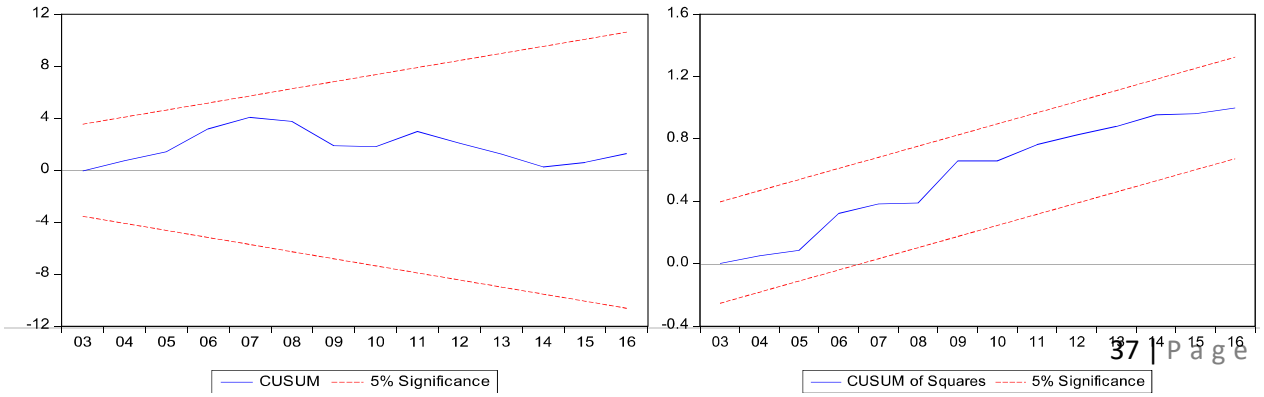
Source: Author's computation using Eviews-8

As we can see from Table 10 above, the model for economic growth is free from statistical problems. This implies that the conclusion made about the existence of long-run relationship among variables of interest is statistically reliable.

In addition to these diagnostic test, model stability test is conducted using cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMQ), as is recommended by Pesaran et al. (2001).

As depicted on Figure 5 below, it can be conclude that the model used to determine the existence of long-run relationship is robust; so that the conclusion made above is reliable. In general the diagnostic test confirms that there was no structural instability in the model during the sample period.

Figure 5: (a) plot of cumulative sum of recursive residuals and (b) plot of cumulative sum of squares of recursive residuals



(a) (b)

Source: Author's computation using Eviews-8
Note: the Straight line represent critical bounds at 5% significance level

4.4.1. Long-run Model Estimation for Economic Growth

The above discussion indicates us the existence of long-run relationship between dependent variable (i.e., economic growth) and explanatory variables (i.e., bank deposit and credit, capital accumulation, national saving, government expenditure and inflation); thus, now we can proceed to long-run coefficient estimation.

Table 11: Estimated long-run coefficients using ARDL (1,1,1,1,1,1)

Dependent Variable: LnRGDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.974708	0.346662	5.696351	***0.0001
LNDEP(-1)	0.055137	0.067361	0.818526	0.4268
LNCR(-1)	-0.019750	0.034115	-0.57887	0.5719
LNGCF(-1)	0.430017	0.163293	2.63341	**0.0197
LNGNS(-1)	0.216760	0.119472	1.814309	*0.0911
LNGEXP(-1)	0.035330	0.113907	0.310169	0.7610
INF(-1)	0.003642	0.000621	5.869617	***0.0000

Source: Author's computation using Eviews-8
Note: the stars, ***, **, and *, indicates a 1%, 5%, and 10% level of significance respectively.

As reveled on table 11 above, the estimated long-run coefficient of banking sector deposit, gross capital formation, national saving, government expenditure and inflation have the hypothesized positive effect on economic growth; while, banking sector credit have the only negative effect on economic growth.

The Long-run impact of the role of Banking Sector on Economic Growth

Banking Sector Deposit: based on the t-statistic, banking deposit has no statistically significant and positive effect on economic growth of the country. The P-value of (0.4268) indicates that there is no statistical evidence to reject the null hypothesis of deposit has no significant effect on economic growth, even at 10% level of significance.

Lack of significant effect of deposit on economic growth is not consistent with the findings of previous studies (Muluneh, 2015 and Venkati, 2016). According to both studies higher level of deposit increase the availability of investment fund which in turn leads to greater productivity and higher growth of capital accumulation. But, banking sector of the country may not be in a position to generate sufficient deposit that the economy requires for higher capital accumulation. Consistent with the current finding, Tesfaye (2014) has also claimed that this shouldn't surprise since the share of financial intermediation in the GDP is still at infant stage. The 2012 MoFED report shows that the share of financial intermediation in GDP was only 2.7%.

Banking Sector Credit: based on the t-statistic, the negative but not significance effect of credit expansion on long-run economic growth is not consistent with the hypothesized expectation. As evidenced from output of regression analysis made using ARDL approach, credit has insignificant effect on the nation's economic growth with a coefficient of 0.0198 and P-value of 0.5719. As a result the study fails to reject the null hypothesis of banking sector credit has no significant effect on long-run economic growth.

This finding is not consistent with what Levine (1996) identified. According to him financial sector is a good predictor of future rates of capital accumulation and economic growth. However if the financial sector is not in a position to affect the rate of capital accumulation, like the case in Ethiopia, either by changing saving rate or by re-allocating saving among capital producing technology, their role becomes insignificant. Besides, according to Estrada et al (2010), financial sector is only contributed to economic growth when it operates efficiently in allocating capital.

The Long-run impact of Capital Accumulation, National Saving, Government Expenditure and Inflation on Economic Growth

Capital Accumulation: based on t-statistic the research rejects the null hypothesis at 5% level of significance. This implies that gross capital formation has significant effect on real economic growth with a coefficient of 0.4030. The positive coefficient of 0.43 indicates that, in the long-run, holding other things constant, a 1% increase in gross capital formation will leads to 43% increase in economic growth. In this regard, Biswas and Saha (2014) in India & Tadesse (2011) in Ethiopia reported similar finding.

National Saving: based on t-statistic the study rejects the null hypothesis of no significant effect at 10% level of significance. That means, gross national saving has impact on economic growth. The positive coefficient of 0.2168 indicates that, in the long-run, holding other things constant, a 1% increase in gross national saving will leads to about 21.68% increase on real economic growth.

In this regard, Abel (2016) reported a negative effect of national saving in Ethiopian economic growth. One possible reason for this might be the fact that the country heavily depend on foreign borrowing, investment and aid to meet its investment requirement. In other words, the level of national saving is not reached to the level of supporting economic growth. Although this study reported a positive effect of national saving, it only appeared significant at 10% which is not statistically advisable.

Government Expenditure: based on the t-statistic the study failed to reject the null hypothesis of government expenditure has no significant impact on long-run economic growth. This implies that government spending has positive effect but not significant. The positive coefficient might communicate that the role of government in economic growth of developing country is critical since the financial sector is limited in their operation and capacity to finance investment or capital accumulation, which the economy required for higher productivity and sustainable development. However, King and Levine (1993) and Levine et al. (2000) figured out that government expenditure has significantly positive effect in economic growth.

Inflation: based on t-statistic the study confirms the presence of a statistically significant and positive effect on long-run economic growth; but, its coefficient (i.e., 0.0036) indicates that the effect of inflation is very small. That means a 1% increase in inflation has about 0.36% increase in economic growth. In this regard, the work of Abel (2016) and others documented similar finding. According to them inflation have positive impact on economic growth as also supported by Philip's curve assumption that proved a creeping inflation about 2% per annum stimulate economic growth.

4.4.2. Short-run Error Correction Model for Economic Growth

Following the acceptance of long run relationship and its equation for gross capital formation, now it's the time for computing the error correction term, which provide significant information about the speed of adjustment towards long run equilibrium.

Table 12: Estimated Short-run coefficients using ARDL (1,0,2,1,1,2,1,1)

Dependent Variable: D(LNRGDP)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013617	0.009292	-1.465456	0.1563
D(LNRGDP(-1))	0.311498	0.155641	2.001388	*0.0573
D(LNDEP)	0.602381	0.160371	3.756181	***0.0010
D(LNCR(-2))	0.011691	0.030673	0.381136	0.7066
D(LNGCF(-1))	-0.232884	0.070147	-3.31993	***0.0030
D(LNGNS(-1))	0.133641	0.046049	2.90214	***0.0080
D(LNGEXP(-2))	-0.144136	0.067984	-2.120167	**0.0450
D(INF(-1))	-0.000336	0.000182	-1.848539	*0.0774
ECT(-1)	-0.39174	0.123656	-3.167981	***0.0043

Source: Author's computation using Eviews-8
Note: the stars, ***, **, and *, indicates a 1%, 5%, and 10% level of significance respectively.

As it can be seen from Table 12, the error correction term is negative and statistically significant. The negative coefficient indicates that 39.17% of shocks happened in the in the previous year will be adjusted towards long-run equilibrium in the current year; so that it take greater than two years for complete adjustment. The rate (i.e., 39.17%) also confirms the presence of stable long-run relationship between real economic growth and explanatory variables (i.e., banking sector deposit, banking sector credit, capital formation, gross national saving, government expenditure, and inflation).

The Short-run impact of role of Banking Sector on Economic Growth

Banking Sector Deposit: like its long-run effect saving mobilization has positive & significant effect on economic growth. As evidenced from the output of regression analysis, deposit has significantly positive effect on the nation's economic growth with a coefficient of 0.6024 and P-value of 0.0010. This implies that, holding other things constant, in the short-run, a 1 % increase

in deposit will leads to about 0.6024% increase in economic growth. The P-value of 0.0010 enables the study to reject the null hypothesis of no effect at 1% level of significance.

Banking Sector Credit: unlike its long-run effect credit expansion has no significant effect on economic growth. As evidenced from output of regression analysis, credit has positive but not significant effect on the nation's economic growth, with a coefficient of 0.0117 and P-value of 0.7066. The P-value of (0.7066) prohibits the study to reject the null hypothesis of no effect, even at 10% level of significance.

The Long-run impact of Capital Accumulation, National Saving, Government Expenditure and Inflation on Economic Growth

Capital Accumulation: unlike its long-run effect, capital formation has statistically significant and negative effect on real economic growth. Based on t-statistic the research rejects the null hypothesis at 1% level of significance with a coefficient of 0.2329 and P-value of 0.0080. The negative coefficient of 0.2328 indicates that, in the long-run, holding other things constant, a 1% increase in gross capital formation will leads to 0.2329% decrease in real economic growth.

National Saving: like its long-run effect gross national saving has significantly positive effect on the country's economic growth. As evidenced from output of regression analysis, credit has significantly positive effect on the country's economic growth with a coefficient of 0.1336 and P-value of 0.0080. This implies that, holding other things constant, in the short-run, a 1% increase in gross national saving will leads to about 0.1336% increase in economic growth. The P-value of (0.0080) enables the study to reject the null hypothesis at 1% level of significance.

Government Expenditure: The t-statistic shows that, in the short-run, government expenditure has negatively significant effect on economic growth. Based on its coefficient, a one percent increase in government expenditure has 0.1441 percent decrease in real economic growth. This finding is also consistent with the work of Teshome (2006) and Tofik (2012) which claims that majority of government expenditure accounts for unproductive & inefficient spending on wages and salaries, rent, debt servicing and transfer payment that have lower impact on short-run economic growth.

Inflation: unlike its long-run effect inflation has statistically significant and negative effect on economic growth. As evidenced from the output of regression analysis, inflation has significant and negative effect with a coefficient of 0.0003. This implies that, holding other things constant, in the short-run, a 1% increase in inflation will leads to about 0.0003% decrease in economic growth. The P-value of (0.0774) enables the study to reject the null hypothesis at 10% level of significance.

4.4.3. Diagnostic test for Short-run Economic Growth model

Table 13: Short-run diagnostic tests

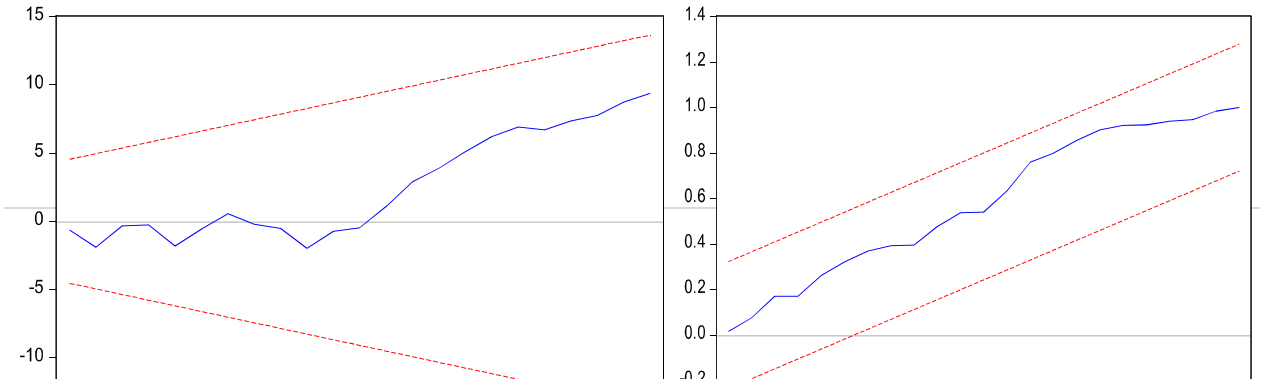
Description	Probability
Jarque-Bera Normality Test:	0.4438
Breusch-Godfrey Serial Correlation LM Test:	0.4964
Breusch-Pagan-Godfrey Heteroskedasticity Test:	0.8909

Source: Author's computation using Eviews-8

Based on the probability value revealed on the above table 13, the research rejects the null hypothesis of three diagnostic tests at 5% level of significance. This implies that the research does not face statistical problems or error terms are normally distributed, not serially correlated, and the model is free from Heteroskedasticity.

In addition to the above tests, the model is also tested to confirm its long run stability. This is done using cumulative sum of recursive residuals (CUSUM), as recommended by Pesaran et al. (2001). This test provides a graphical representation of model stability and shows the period at which the instability occurred, if any (see, Figure 6 on next page).

Figure 6: (a) plot of cumulative sum of recursive residuals and (b) plot of cumulative sum of squares of recursive residuals



(a)

(a) (b)

Source: Author's computation using Eviews-8
Note: the Straight line represent critical bounds at 5% significance level

As revealed from the above figure, the blue line is between the two red lines or don't cross the critical red lines during the period under consideration; so that we can confidently use the estimated coefficients, i.e., they are reliable and efficient.

4.5. GRANGER CAUSALITY

Causality analysis is performed using equation (9) and (10) specified in chapter three. The test is performed for all variables: bank deposit, bank credit, economic growth, capital accumulation, national saving, government expenditure, and inflation. The null hypothesis for each equation is that X does not Granger-cause Y in the first regression and that Y does not Granger-Cause X in the second regression; then, decision is made based on Wald F-statistics for the joint hypothesis (see, Table 14 to 18).

Table 14: The role of Bank and real Gross Domestic Product

Null Hypothesis:	Obs	F-Statistic	Prob.
Deposit does not Granger Cause Real Gross Domestic Product	35	5.91761	0.0208
Real Gross Domestic Product does not Granger Cause Deposit		14.3381	0.0006
Credit does not Granger Cause Real Gross Domestic Product	35	2.83777	0.1018
Real Gross Domestic Product does not Granger Cause Credit		14.1308	0.0007

Source: Author's computation using Eviews-8

As presented on table 14 above, the null hypothesis deposit does not granger cause real GDP and Vice versa is rejected. This shows the existence of a bi-directional causality running from bank deposit to real GDP and vice versa. Therefore, deposit is not only a cause for economic growth rather it is also effect for it. On the other hand, the research failed to reject the null hypothesis of credit does not granger cause economic growth; but, reject the null hypothesis of no granger

causality running from economic growth to credit, at 1% level of significance. Therefore, we can conclude that there is a unidirectional causality running from economic growth to credit which is also consistent with the findings of Obademi and Elumaro (2014).

Table 15: The role of Bank and Gross Capital Formation

Null Hypothesis:	Obs	F-Statistic	Prob.
Gross Capital Formation does not Granger Cause Deposit	35	11.8410	0.0016
Deposit does not Granger Cause Gross Capital Formation		0.01399	0.9066
Gross Capital Formation does not Granger Cause Credit	35	5.47078	0.0257
Credit does not Granger Cause Gross Capital Formation		1.57353	0.2188

Source: Author's computation using Eviews-8

As revealed on table 15 above, the research rejects the null hypothesis of gross capital formation does not granger-cause bank deposit and bank credit. This implies that the role of banking sector, as measured by deposit and credit, was not significant; rather capital accumulation of the country support the role of the financial sector in promoting deposit mobilization and credit expansion.

Table 16: Real Gross Domestic Product and Gross Capital Formation

Null Hypothesis:	Obs	F-Statistic	Prob.
Gross Capital Formation does not Granger Cause Real Gross Domestic Product	35	5.38737	0.0268
Real Gross Domestic Product does not Granger Cause Gross Capital Formation		16.0600	0.0003

Source: Author's computation using Eviews-8

As revealed on table 16 above, the research reject the null hypothesis of Capital Formation does not granger cause Real Gross Domestic Product and vice versa at 5% and 1% significance level respectively. In line with this, Uneze (2013) in his investigation of the role of capital formation in economic growth of sub-Saharan African countries identified a bi-directional relationship. Thus, the research concludes that capital accumulation is not only the cause for economic growth but it is also an effect.

Table 17: Gross Capital Formation and Control Variables

Null Hypothesis:	Obs	F-Statistic	Prob.
Gross National Saving does not Granger Cause Gross Capital Formation	35	4.65412	0.0386
Gross Capital Formation does not Granger Cause Gross National Saving		3.14209	0.0858
Government Expenditure does not Granger Cause Gross Capital Formation	35	0.19851	0.6589
Gross Capital Formation does not Granger Cause Government Expenditure		7.44429	0.0102
Inflation does not Granger Cause Gross Capital Formation	35	0.09920	0.7548
Gross Capital Formation does not Granger Cause Inflation		0.80416	0.3765

Source: Author's computation using Eviews-8

As revealed from table 17, the research reject the null hypothesis of gross national saving does not granger cause gross capital formation at 5% significance level, yet the reverse doesn't hold true since it is only significant at 10%. Pertaining to the second control variable the research failed to reject the null of government expenditure doesn't granger cause gross capital formation. However, there is statistically significant evidence on a unidirectional causality which runs from capital formation to government expenditure. Regarding the last control variable, the research failed to reject the null hypothesis of inflation doesn't granger cause capital accumulation. This implies that there is no statistically significant evidence of causality among the variables.

Table 18: Real Gross Capital Formation and Control Variables

Null Hypothesis:	Obs	F-Statistic	Prob.
Gross National Saving does not Granger Cause Real Gross Domestic Product	35	1.14524	0.2926
Real Gross Domestic Product does not Granger Cause Gross National Saving		20.1054	0.0001
Government Expenditure does not Granger Cause Real Gross Domestic Product	35	6.31938	0.0172
Real Gross Domestic Product does not Granger Cause Government Expenditure		13.3509	0.0009
Inflation does not Granger Cause Real Gross Domestic Product	35	0.22915	0.6354
Real Gross Domestic Product does not Granger Cause Inflation		1.52984	0.2251

Source: Author's computation using Eviews-8

As revealed from table 18 above, the research failed to reject the null hypothesis of national saving does not granger cause real GDP; rather there is only a unidirectional causality running from real gross domestic product to gross national savings, which is also consistent with the findings of Mohan (2006) and Abel (2016). As a result, it becomes against the popular perception that higher saving cause economic growth and calls for discussion regarding the appropriateness of using national saving as a target variable for economic growth. Thus, we can conclude that economic growth proceeded and granger-cause national savings as the case for Nigeria (Nurudeen, 2010).

The research rejects the null hypothesis of government expenditure does not granger cause real GDP & vice versa. This confirms the existence of statistically significant bidirectional causality between government expenditure and economic growth. In contrast, the research fails to reject the null hypothesis of inflation doesn't granger cause economic growth and vice versa, which implies that there is no statistically sufficient evidence of causality among the two variables.

4.6. SUMMARY OF FINDINGS

The study examined the role of banking sector in capital accumulation and economic growth based on 36 years data (i.e., from 1981 to 2016) and using ARDL approach to co-integration and Error Correction Model (ECM). The research used banking sector deposit and credit as a proxy to the role of banking sector, real GDP as a proxy to economic growth, & gross capital formation as a proxy to capital accumulation.

The unit root analysis shows the existence of strong statistical evidence against the null hypothesis of variable has unit root or variable is not stationary at first difference. The ARDL bound test result indicates the existence of long-run equilibrium relationships between the role of banking sector and other control variables with gross capital formation and economic growth. Besides, the result of the ECT_{t-1} coefficient of the first model (-0.6061) has the expected sign and significance level. This implies that the speed of adjustment back from short-run disequilibrium to the long-run equilibrium is around 60.61%. Similarly, the result of the ECT_{t-1} coefficient of the second model (-0.3917) has the expected sign and significance level. This implies that the speed of adjustment back from short-run disequilibrium to the long-run equilibrium is around 39.17%. The stability of result of the error correction model is confirmed with CUSUM & CUSUMQ test.

The result of the estimated coefficient show that the deposit mobilization role of banking sector has statistically significant and positive effect in capital accumulation and economic growth, in the short-run, but has no significant effect in the long-run. In the long-run, banking sector credit has no significant impact on capital accumulation and economic growth. However, in the short-run, credit has significantly positive impact on capital accumulation but not in economic growth. The research has also identified a statistically significant impact of gross capital formation on economic growth in the long-run.

In the short-run, gross national saving has significant and positive impact in capital accumulation and economic growth; but, in the long-run, it has no significant impact in capital accumulation, while it has less impact in economic growth. On the other hand, government expenditure has significant impact on capital formation in both short-run and long-run; but it has significantly negative effect and insignificantly positive effect on economic growth in the short-run and in the long-run respectively. There is also an interesting finding regarding inflation. Inflation has

statistically significant and negative effect on capital accumulation and economic growth in both short-run as well as long-run.

Based on the granger-causality analysis the research also comes up with the following results. Banking sector deposit, gross capital formation, and government expenditure has a bi-directional causality with economic growth; whereas credit and gross national saving has only a one way causality running from economic growth to them. There is also a one way causality running from gross capital formation to banking sector deposit and credit and government expenditure and from national saving to capital formation. But, the research finds no causality between inflation and capital formation and between inflation and economic growth.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1. CONCLUSION

This study is conducted with the aim of identifying the effect of the role of banking sector in capital accumulation and economic growth of Ethiopia over the period of 36 years (i.e., from 1981 to 2016). In this connection, the study employed ARDL approach to co-integration, while determining the presence of long-run relationship, and Error Correction Model. The study used banking sector deposit and credit as a proxy to the role of banking sector, real GDP as a proxy to economic growth, and gross capital formation as a proxy to capital accumulation.

Except inflation which is stationary at level and calls for the application of ARDL approach to co-integration, the unit root analysis shows the presence of strong statistical evidence against the null hypothesis of variables has unit root or variables are not stationary at their first difference. The bound test results indicate the presence of long-run equilibrium relationships between the role of banking sector, capital accumulation and economic growth.

Besides the result of the ECT_{t-1} coefficient of the first model (i.e., -0.6061) has the expected sign and significance level. This implies that 60.61 percent of short-run disequilibrium occurred in the previous year adjusted to its long-run equilibrium in the current year. Moreover, such a higher coefficient is also a further proof of the existence of stable long-run relationship between the variables. In similar way, the result of the ECT_{t-1} coefficient of the second model (i.e., -0.3917) has the expected sign and significance level, which communicates that 39.17 percent of short-run disequilibrium is adjusted to its long-run equilibrium, each period.

The result of estimated coefficient shows that, in the short-run, the deposit mobilization role of banking sector has significantly positive effect on capital accumulation and economic growth, but it has no significant effect in the long-run growth. Similarly, bank credit has no significant effect on long-run capital accumulation and economic growth; however, in the short-run, it has significant and positive effect on capital accumulation. Test of granger causality, in this regard, confirm that the role of banking sector is not in a position to support long-run growth; that means deposit and credit are only reflexive to the rise of capital accumulation and economic growth. In general, the role of banking sector doesn't bring economic growth through capital accumulation.

Consistent with the findings of Abel (2016), the study has identified a statistically significant and positive impact of capital accumulation on long-run economic growth. The causality test in this regard has identified a bidirectional relationship between capital accumulation and growth. This implies that capital accumulation is not only cause for economic growth rather it is also an effect.

Regarding control variables: In the short-run, national saving has significantly positive effect on capital accumulation and economic growth. But, in the long-run, it has no significant impact on capital formation while having lesser impact on economic growth. The granger non-causality test conducted in this regard confirms the existence of a unidirectional causality running from growth to national saving, which is also consistent with the findings of Abel (2016).

Government expenditure is the only variable that has short-run and long-run impact on capital accumulation. However, in the short-run, government expenditure has adverse effect on long-run economic growth. The pair-wise granger non-causality test, in this regard, confirms the presence of bidirectional causality with economic growth, while there is a unidirectional causality with capital accumulation that runs from capital accumulation to government expenditure.

There is also an interesting finding regarding inflation. Inflation has statistically significant effect on both capital accumulation and economic growth. But, due to its small coefficient the effect of inflation is very small. The pair-wise granger causality test confirms that there is no statistically strong evidence of causality among the three variables, i.e., inflation, capital accumulation and economic growth. Therefore, we can conclude that inflation is not adversely affecting the capital accumulation and economic growth of the country rather it has a somewhat positive effect.

5.2. RECOMMENDATION

The result of this study has significant policy implication. Since the role of the financial sector in capital accumulation and economic growth has mainly short-run effect, a lot of effort is expected of policymakers so as to strengthen their role in the long-run. As theories and the findings of empirical studies claimed that the financial/banking sector can significantly contribute to long-run economic growth when it is efficient and competitive. Yet, in this regard and as evident by earlier studies, banking sector of the country is characterized as monopolistic (Alemnew, 2017) and inefficient (Tadesse, 2017). Thus, policymakers shall focus on creating favorable operating environment, in order to promote the deposit mobilization and credit expansion role of banking sector through which long-run economic growth is achieved.

Capital accumulation is of strategic importance in the early stage of economic growth as the country suffers from capital deficiency. It is, therefore, recommended to achieve a higher ratio of savings to national income. In this connection, a well functioning banking system, by mobilizing saving and channeling into most productive use, significantly contribute to capital accumulation. Thus, policymakers shall formulate policies that would enable the financial sector creates higher level of savings and efficiently allocate to the most productive sector of the economy.

Another possible reason for lack of significant long-run relationship between the role of banking sector, capital accumulation and economic growth might be the fact that the financial sector is not growing as expected and in response to economic growth. So that, policymakers are advised to take into account the effect of monetary and fiscal policies that impede the role of financial intermediaries (i.e., banks) in the provision of financial service; the effect of legal, political and institutional arrangements that heavily determine the financial sector development.

In general, in order to bring financial sector development policies should focus on creating a contestable financial sector. This can be achieved through: (1) creating stock and bond market to increase financial sector competition, (2) lowering entry barrier, fewer regulatory restrictions on banking activities & grater banking freedom that are essential for improving efficiency. This will improve capacity to mobilize savings and efficiency to allocate financial resources which are a prerequisite for rapid capital accumulation and economic growth. As theorists claim, without such improvement the banking sector will jeopardize the widely held expectation of rising economic growth.

5.3. FURTHER RESEARCH

The study tried to bridge the gap on existing literatures as identified in the problem statement. Yet, further investigation is required to identify the real cause for why the banking sector has not significantly contributed to long-run capital accumulation and economic growth. Besides, the study recommends similar work using another method of long-run model estimation, by taking the legal, political economy, religion and culture, and structural effects into account.

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ANNEX

Annex 1: Long-run ARDL/bound testing for Capital Accumulation

Dependent Variable: D(LNGCF)
Method: Least Squares
Date: 02/09/18 Time: 22:02
Sample (adjusted): 1983 2016
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	0.977939	0.371992	2.628923	0.0161
D(LNGCF(-1))	-0.15411	0.123817	-1.24464	0.2277
D(LNDEP(-1))	0.862697	0.291028	2.964306	0.0077
D(LNCR(-1))	0.206745	0.104809	1.972591	0.0625
D(LNGNS)	0.429105	0.077101	5.565497	0.0000
D(LNGEXP)	0.485305	0.163018	2.976993	0.0075
D(LNGEXP(-1))	-0.41458	0.188014	-2.20503	0.0393
D(INF)	-0.00049	0.000545	-0.90676	0.3753
LNGCF(-1)	-0.60682	0.185874	-3.26469	0.0039
LNDEP(-1)	-0.32713	0.145789	-2.24384	0.0363
LNCR(-1)	0.026238	0.062594	0.419177	0.6796
LNGNS(-1)	0.07429	0.156019	0.476158	0.6391
LNGEXP(-1)	0.670948	0.218351	3.072793	0.0060
INF(-1)	-0.00235	0.000796	-2.94557	0.0080
R-squared	0.899862	Mean dependent var		0.03381
Adjusted R-squared	0.834772	S.D. dependent var		0.092749
S.E. of regression	0.037701	Akaike info criterion		-3.42537
Sum squared resid	0.028427	Schwarz criterion		-2.79687
Log likelihood	72.23134	Hannan-Quinn criter.		-3.21104
F-statistic	13.82491	Durbin-Watson stat		1.920535
Prob(F-statistic)	0.0000			

Annex 2: Short-run Error Correction Model for Capital Accumulation

Dependent Variable: D(LNGCF)
Method: Least Squares
Date: 02/10/18 Time: 07:45
Sample (adjusted): 1984 2016
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.02392	0.01765	-1.35508	0.1875
D(LNGCF(-1))	-0.19451	0.122863	-1.58312	0.1260

D(LNDEP(-1))	0.937227	0.262581	3.569281	0.0015
D(LNCR(-1))	0.194804	0.087893	2.216377	0.0360
D(LNGNS)	0.535936	0.065661	8.162133	0.0000
D(LNGEXP(-1))	-0.28115	0.156341	-1.79829	0.0842
INF(-1)	-0.00131	0.000594	-2.21002	0.0365
ECT(-1)	-0.60607	0.260976	-2.32231	0.0287
R-squared	0.836429	Mean dependent var		0.035101
Adjusted R-squared	0.790629	S.D. dependent var		0.093876
S.E. of regression	0.042955	Akaike info criterion		-3.25012
Sum squared resid	0.046128	Schwarz criterion		-2.88733
Log likelihood	61.62694	Hannan-Quinn criter.		-3.12805
F-statistic	18.26264	Durbin-Watson stat		1.76724
Prob(F-statistic)	0.0000			

Annex 3: Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: LNGCF LNDEP LNCR LNGNS LNGEXP INF
Exogenous variables: C
Sample: 1981 2016
Included observations: 33

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-8.46939	NA	9.68E-08	0.876933	1.149025	0.968484
1	167.6806	277.5697*	2.06e-11*	-7.617005	-5.712359*	-6.976150*
2	203.5487	43.4765	2.62E-11	-7.609012	-4.071812	-6.418852
3	252.0146	41.12257	2.46E-11	-8.364520*	-3.194767	-6.625056

Annex 4: Long-run ARDL/bound testing for Economic Growth

Dependent Variable: D(LNRGDP)
Method: Least Squares
Date: 02/09/18 Time: 21:49
Sample (adjusted): 1984 2016
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.172207	0.463703	2.527929	0.0241
D(LNRGDP(-1))	0.019998	0.14597	0.137002	0.893

D(LNDEP(-1))	-0.120586	0.120591	-0.999962	0.3343
D(LNCR(-2))	0.037854	0.039781	0.951565	0.3575
D(LNGCF)	0.190896	0.072859	2.620084	0.0202
D(LNGCF(-1))	-0.120666	0.057888	-2.084468	0.0559
D(LNGCF(-2))	-0.144041	0.058559	-2.459738	0.0275
D(LNGNS)	0.068188	0.04215	1.617743	0.128
D(LNGEXP(-2))	-0.008635	0.051438	-0.167878	0.8691
D(INF)	0.000463	0.000203	2.284078	0.0385
D(INF(-1))	-0.000973	0.000466	-2.090127	0.0553
D(INF(-2))	-0.000279	0.000258	-1.080953	0.298
LNRGDP(-1)	-0.59361	0.157074	-3.779167	0.002
LNDEP(-1)	0.03273	0.041922	0.780725	0.448
LNCR(-1)	-0.011723	0.020297	-0.577567	0.5727
LNGCF(-1)	0.255262	0.118565	2.152922	0.0492
LNGNS(-1)	0.128671	0.057633	2.232606	0.0424
LNGEXP(-1)	0.020972	0.068521	0.306074	0.7641
INF(-1)	0.002162	0.000679	3.183734	0.0066
R-squared	0.908473	Mean dependent var		0.024048
Adjusted R-squared	0.790795	S.D. dependent var		0.02604
S.E. of regression	0.01191	Akaike info criterion		-5.728736
Sum squared resid	0.001986	Schwarz criterion		-4.86711
Log likelihood	113.5241	Hannan-Quinn criter.		-5.438825
F-statistic	7.719989	Durbin-Watson stat		2.165409
Prob(F-statistic)	0.000178			

Annex 5: Short-run Error Correction Model for Economic Growth

Dependent Variable: D(LNRGDP)
Method: Least Squares
Date: 02/09/18 Time: 21:57
Sample (adjusted): 1984 2016
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013617	0.009292	-1.465456	0.1563

D(LNRGDP(-1))	0.311498	0.155641	2.001388	0.0573
D(LNDEP)	0.534792	0.109701	4.874987	0.0001
D(LNDEP(-2))	0.067589	0.130135	0.519379	0.6085
D(LNCR(-2))	0.011691	0.030673	0.381136	0.7066
D(LNGCF(-1))	-0.232884	0.070147	-3.31993	0.0030
D(LNGNS(-1))	0.133641	0.046049	2.90214	0.0080
D(LNGEXP(-2))	-0.144136	0.067984	-2.120167	0.0450
D(INF(-1))	-0.000336	0.000182	-1.848539	0.0774
ECT(-1)	-0.391740	0.123656	-3.167981	0.0043
R-squared	0.694862	Mean dependent var		0.024048
Adjusted R-squared	0.57546	S.D. dependent var		0.02604
S.E. of regression	0.016967	Akaike info criterion		-5.070064
Sum squared resid	0.006621	Schwarz criterion		-4.616577
Log likelihood	93.65605	Hannan-Quinn criter.		-4.917479
F-statistic	5.819528	Durbin-Watson stat		1.609024
Prob(F-statistic)	0.000307			

Annex 6: Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: LNRGDP
Exogenous variables: C LNDEP LNCR LNGCF LNGNS LNGEXP INF
Date: 02/15/18 Time: 23:25
Included observations: 34

Lag	LogL	LR	FPE	AIC	SC	HQ
0	74.26077	NA	0.001127	-3.956516	-3.642265	-3.849347
1	89.2002	22.84854*	0.000498*	-4.776482*	-4.417339*	-4.654004*
2	89.20308	0.004243	0.00053	-4.717828	-4.313792	-4.58004