



St. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

**THE CONTRIBUTION OF BANKING SECTORS DEVELOPMENT
TO ECONOMIC GROWTH IN ETHIOPIA**

BY

SEYIFU TESHOME

May 2018

Addis Ababa, Ethiopia

St. MARY UNIVERSITY

SCHOOL OF GRADUATE STUDIES

**THE CONTRIBUTION OF BANKING SECTORS DEVELOPMENT
TO ECONOMIC GROWTH IN ETHIOPIA**

BY

SEYIFU TESHOME

**Thesis Submitted to St.Mary's University School of Graduates
Agriculture and Development studies Program in partial Fulfillment of
the Requirements for the Degree of Masters of Arts in Development
Economics.**

May 2018

Addis Ababa, Ethiopia

EXAMINERS

As member of the board of examiners of the master thesis open defense examination, we certify that we have read and evaluated the thesis prepared by **Seyifu Teshome** and examined the candidate. We recommend that this thesis be accepted as fulfilling the thesis requirement for the degree of masters of Art in Development economics.

Approved by Board of Examiners

Signature

Dean, Graduate Studies

Signature

Advisor

Signature

External Examiner

Signature

Internal Examiner

Signature

DECLARATION

I, the undersigned, declare that this Thesis is my original work; prepared under the guidance of Gemoraw Adinew (Asst.Prof.). All the sources of materials used for this thesis have been dully acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Name

Signature and Date

Endorsement

This is thesis entitled the contribution of banking sector development to economic growth in Ethiopia has been submitted to St.mary's university ,school of Graduate Studies for examination with my approval as a university advisor.

Advisor

Signature and Date

Table of contents

Acknowledgments.....	vii
List of acronyms.....	viii
List of tables.....	ix
List of figures.....	x
Abstract.....	xi
Chapter one.....	Error!
Bookmark not defined.	
1.1. Background of the study.....	Error! Bookmark not defined.
1.2. Statement of the problem.....	2
1.3. General objective of the study.....	3
1.4. Research questions.....	3
1.5. Significance of the study.....	4
1.6. Scope of the study.....	4
1.7. Limitation of the study.....	4

1.9. Organization of the thesis.....	5
Chapter Two.....	6
2. Literature review.....	6
2.1 Theoretical literature.....	6
2.1.1 Economic Growth.....	6
2.2. Economic growth models.....	7
2.2.1. The neo-classical growth model.....	7
2.2.2. Endogenous growth models.....	7
2.3. Theory of financial intermediation.....	8
2.4. Functions of financial system.....	9
(a) mobilization and allocation of savings.....	10
(b) risk management.....	10
(c) acquiring information.....	11
(d) monitoring borrowers, and exerting corporate control.....	12
(e) facilitating exchange.....	12
2.5. Banking sector and economic development.....	13
2.6. Supply-leading vs demand following hypothesis.....	14
2.7. Indicators of banking sector development.....	16
2.7.1. Deposit.....	16
2.7.2. Loan and advances.....	17
2.7.3. Size of banking sector (assets).....	18
2.8 Empirical literature.....	19
2.9 .History and characteristics of the banking sector in ethiopia.....	22

Chapter three	24
3.1 research methods	24
3.2 Source of data.....	24
3.3 Population of the study.....	24
3.4 Data collection instruments.....	25
3.5 Model specification.....	25
3.6 Description of variables.....	26
3.6.1 Dependent variable.....	26
3.6.2 Independent variables.....	26
3.6.3 Control variables.....	27
3.7 Data analysis procedures.....	27
3.7.1 unit root tests.....	28
3.7.2 vector auto regression.....	28
3.7.3 Granger Causality Test	28
Chapter four.....	30
4.1 Descriptive analysis	30
4.2 Empirical analysis	32
4.2.1 Data testing	32
4.3 Test of Granger Causality.....	35
4.4 Empirical analysis and discussions of results.....	36

Chapter Five.....	40
5.1	
Conclusions.....	40
5.2 Recommendations.....	41
Reference.....	42

ACKNOWLEDGEMENTS

First and for most, I would like thanks to GOD Almighty who has made this study a success. Next, I like to thank my appreciation and gratitude to my advisor Gemoraw Adinew (Asst.Prof.) for his constructive advice and guidance in the course of the conducting this study.

My special appreciation also goes to the office for their cooperation in providing me all the necessary data required for the study.

I owe my deepest appreciation and gratitude to my wife Birtukan Habtamu for her encouragement and support.

Finally, I would like to forward my gratitude to all my best friends and my family who have always stood behind me for support and guidance.

ACRONYMS

GDP:Gross Domestic Product

MoFED:Ministry of Finance and Economic Development

NBE:National Bank of Ethiopia

IMF:International Money Finance

GNP:Gross National Product

VIF:Variance Inflation Factor

OLS:Ordinary Least Square

VAR:Vector Autoregressive

LIST OF TABLES

Table 3.1: Definition and expected sign of variable.....	27
Table 4.1: Stationarity Tests of all the variables at their levels and first difference.....	34
Table 4.2: pair -wise test for granger causality.....	36
Table 4.3: Random –effect GLS Regression.....	37

LIST OF FIGURES

Figure 4.1: Bank sector development and economic growth in Ethiopia (2001-2016.....31

ABSTRACT

In this study, to investigate the impact of banks 'sector development in the Ethiopian economic growth. Therefore, the study used secondary sources of data. It employs Vector Autoregressive (VAR) approach to assess the impact of bank sector development contributes to economic growth. It further used the granger causality test so as to find the direction of causality between banks sector development and economic growth and unit root test conducted. Thus, the study Im-pesaran-shin root test was applied. The result suggested that all variables were non stationary at level except loan and advance. whereas when they are first difference all variables were stationary. Moreover, the study conducted granger causality test to know causality among variables and found that loan and advance has granger cause economic growth, no casual relationship is found among economic growth and other remaining variable. The study adopted different analysis techniques include descriptive statistics and regression analysis. The study found that a positive and in significant relationship among economic growth and deposit and loan and advance. Whereas negative and in significant association ship between economic growth bank size i.e. asset. Furthermore, in relation to control variable the study has found positive and significant relationship between economic growth and government expenditures. Finally, to maintain and sustain economic growth all stakeholders to whom

concerned should have to pay a paramount attention for banks considering their influence in the overall economic prospects.

Key words: *Vector Autoregressive (VAR), Granger causality, bank sector development, economic growth*

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Financial sector development plays a vital role in facilitating economic growth. A sound financial system support growth through mobilizing and pooling saving, investment and allocating capital, Monitoring investments and exerting corporate governance, facilitating the trading, diversification, and management of risks and facilitating the exchange of good and service. There is also financial sector development contributes to poverty reduction and major channel is through economic growth. Higher growth benefits the poor by creating more jobs enabling the government to allocate more fiscal resources on social spending and increasing funds available to the poor for investment (Juzhong, etal, 2009).

However, the debate regarding the causal relationship between financial development and economic growth has been ongoing since the nineteenth century. Schumpeter (1911) observed that financial markets (banks in particular) play a significant role in the growth of the real economy by channeling funds from savers to borrowers in an efficient way to facilitate investment in physical capital, spur innovation and the ‘creative destruction process’. He contends that entrepreneurs require credit in order to finance the adoption of new production techniques and banks are viewed as key agents in facilitating these financial intermediating activities and promoting economic development. Similarly, Goldsmith (1969) argue that development of a financial system is crucially important in stimulating economic growth and that under-developed financial systems retard economic growth.

In contrast, Robinson (1952) argued that finance does not exert a causal impact on growth; instead, it is financial development that follows economic growth – as a result of higher demand for financial services. Although many studies have investigated the causal relationship between financial development and economic growth, the results are still ambiguous.

Currently, the financial sector in Ethiopia is composed of the banking industry, insurance companies, microfinance institutions, saving and credit cooperatives and the informal financial sector. But the Ethiopian financial system is dominated by banks.

1.2. Statement of the problem

A developed and efficient financial system specially banking sector is important to mobilize saving and foreign resources, effective trade activity, create employment opportunity and to allocate them to high return investment. The lack of domestic savings opportunities provided by private banks and the limited available access to bank credit for small businesses dramatically restrict economic growth. Public sector banks will inevitably lead investment in key development project such as those involving infrastructure, but broad-based development is required in order to create sustainable economic growth and

this investment typically comes from private sector banks as their deposit base grows (Tom, 2014).

In the late 1980s, the Endogenous Growth Theory emerged and paved the way for new theories exploring the link between economic growth and financial sector development. Under the basic endogenous growth model, the development of financial sector might affect economic growth in three ways. First, it can increase the productivity of investments. Second, an efficient financial sector reduces transaction costs and thus increases the share of savings channeled into productive investments. Third, financial sector development can either promote or decline savings (Pagano, 1993). A more efficient financial sector is more likely to direct a country's scarce resources to their most productive use. As this occurs, economic growth could reach its full potential. Besides, since the primary task of financial intermediaries is to channel funds to the most profitable investments they identify, then efficient financial markets improve the quality of investments which eventually enhances economic growth. Generally speaking, a well developed financial system could improve the efficiency of financing decisions and favoring a better allocation of resources and accelerate economic growth.

The work `Hailay, 2013` is one evidence that shows the contribution of banking sector development has positive impact of on economic growth. On the other hand, economic growth will get faster when transaction cost get lower and a large share of savings is flowed in to investment. Banking occupies one of the most important positions in the modern economic world. It is necessary for trade and industry. Hence it is one of the great agencies of commerce and its presence is very helpful to the economic activity and industrial progress of country. These days, the function of banks is confined not only to advancing loans to the public and accepting their deposit, their contribution in accelerating the rate of economic development for a nation. In addition banks play a vital role in economic development through engaging themselves in an intermediary role which enhances investment and growth (melkamu, 2015).

Currently, the financial sector in Ethiopia is composed of the bank, insurance companies, microfinance institution, saving and credit association and informal financial sector (i.e idir,equb and maheber). But the Ethiopian financial system is rudimentary and dominated by banks. Zerayehu *et al* (2013) noted that the banking industry accounts for about 95% of the total financial sector assets. But, he also noted that Ethiopia is still remains a highly under-banked country in the world even though supply of the banking service is growing from year to year but it has not led to an increased outreach of the banking system at large (Roman, 2012).

Therefore, it is possible to say that Ethiopia`s bank sector development ,as measured by its development indicators such as deposit, loan and advance, and asset with respect to GDP needs empirically investigation in the context of just to know whether those indicators are affects the growth of Ethiopian economy.

In general the banking sector of Ethiopia needs deep understanding so as to find the clear impact or contribution it has on the economy.

1.3. Objective of the Study

The general objective of this study is to investigate the contribution of banks` development on economic growth in Ethiopia.

The Specific objectives are:-

- Investigate the relationship between bank sector developments to economic growth.
- To describe the trend of bank development with respect to saving, loan and advance and asset

1.4. Research questions

In line with the broad purpose statement highlighted above, the following specific research questions were formulated as follows.

RQ1. What about the trends of banks` development indicators?

RQ2. Does the development of banks cause economic growth?

1.5. Significance of the study

As stated above an efficient financial system specially banking sector is important to mobilize saving and allocate this resource to investment with high return. Therefore, the finding of this is expected to provide a comprehensive approach to understand the influence of banking sector development on Ethiopian economy. Furthermore, the result of this study could be used as base for designing proper policy that ensure the contribution of banking sector to the growth of national economy. On the other hand, the study will helps other researchers as a source of reference and as a stepping stone for those who want to make further study on similar area.

1.6. Scope of the Study

The scope of the study is restricted to the investigation of banks' development indicators affecting economic growth in Ethiopia within the period between 2001 and 2016. The study includes one government and four private owned commercial banks that begun operation before 2001. The study investigates indicators of banking sector development in terms of loan and advance, deposit and assets. In addition to the researcher takes government expenditure and export as control variables.

1.7. Limitation of the study

As stated the above to investigate bank sector development on economic growth. The researchers used main variable asset, deposit and loan and advance and also control variables that are export and government expenditure. However, due to the availability of data this study is unable to include other variables which are used other researcher with in similar studies. On the other hand this study considers only five commercial banks data because the remaining banks they did not start operation before 2001, that means has not available data.

1.8. Organization of the Study

For a systematic and scientific approach, this research work has divided into five chapters. Therefore, chapter one, introduces the research subject briefly and, incorporating the problems and results from past studies. The problem statement is given and research objectives have been clearly described and based on which, hypotheses are formed and model is specified. Apart from this, it also identifies the significance, scope and limitations of the study. In chapter two, both relevant theoretical and empirical literature are discussed. The methodology of the research is presented in chapter three. Chapter four is deals with result and discussion. Finally, chapter five presents conclusions and recommendations

CHAPTER TWO

LITERATURE REVIEW

This chapter discusses the literature concerning the banking sector development and economic growth. This review of literature establishes framework for the study and highlights the previous studies, which in turn, helps in clearly identifying the gap in the literature. The discussion of the literature on banking sector development and economic growth has two sections; the first section considers theoretical framework and second, empirical studies on the relationship between financial developments in general and banking sector development in particular economic growth.

2.1. Theoretical Literature

The objective of this particular section is to provide policy makers, the research community, and academics who wish to conduct research in the field or learn more about it, with an idea of the theoretical relationship between financial development in general, banks and economic growth in particular. It is therefore important to determine how the financial sector and overall economy are related to each other. A review of theory in this regard will guide us to understand the importance of the said relationship from a theoretical perspective.

2.1.1 Economic Growth

Economic growth is an increase in the capacity of an economy to produce goods and service, compared from one periods of time to another. On the other side, Economic

growth, which is defined as an increase in Gross National Product (GNP) or increase in Gross Domestic Product (GDP), has been the main purpose of most economic studies and models from Adam Smith (the father of Classical Economics) until the present time.

Today, growth is still an important topic of serious discussion among economists. Transfer from exogenous to endogenous growth models was in fact a progress toward a better explanation of reality. While in exogenous growth models the focus was on the accumulation of capital and innovations and technological changes were determined outside the model, in endogenous growth models they are determined within the model. For example, in Romer's model (1987) the technology factor is determined by the knowledge spillover effect. He followed Arrow (1962) who reasoned that every investment unit not only increases physical capital stock but also increases the technology level of firms via the knowledge spillover effect. Romer (1990) also developed a new growth model which is a combination of the knowledge spillover effect model and the monopoly power model.

2.2 Economic Growth Models

Modern theories of economic growth have been premised on the same assumption about investment and saving as sources of economic growth. We attempt to see, two economic growth models include the neoclassical model and endogenous growth model, the detail for each of economic growth model is presented here below.

2.2.1 The Neo-Classical Growth Model

Until recently, growth theorizing was dominated by the Solow model, which was first proposed as an alternative to the Harrod-Domar model, which holds that various steady state rates of growth are all independent of the rate of savings, even though the levels of the variables are affected by savings. Thus any increase in growth rates resulting from increased saving is only temporary, as under the framework; only through technological progress can continuous economic growth be achieved.

Furthermore, Solow argued that exogenous technological improvement and capital accumulation drive economic growth. The result of the Solow growth model was that many came to believe that financial markets had only minor influence on the rate of investment in physical capital, and the changes in investment were viewed as having only minor effects on economic growth.

2.2.2 Endogenous Growth Models

The body of literature that challenged the assumptions of the Solow model came to be known as endogenous growth model. Though the initial arguments was on “convergence” that is the inability of the Solow model to explain the diversity of the observed growth rates across countries. In an endogenous model of growth, it has been argued that financial development can affect growth in three ways; namely raising the efficiency of financial intermediation, increasing the social marginal productivity of capital and influencing the private savings rate. This makes well functioning financial markets at the core of endogenous technical progress because a well functioning financial system increases the efficiency of the human capital as well as the physical capital. Moreover, productive financial service improves and expands the scope of innovative activity. These have been confirmed by various studies.

Levine (1997) stressed the informational role of financial intermediation in an endogenous growth model and argues that its role is crucially related to productivity growth of capital. In a related study, Bencivenga and Smith (1991) stressed that through its reduction of liquidity risks, efficient financial intermediation stimulates savers to hold their wealth increasingly in productive assets, contributing to productive investment and growth. Saint-Paul (1992) also emphasized the development of a well functioning stock market in stimulating economic growth, especially as it affects the sharing of risks of entrepreneurs. The endogenous growth model provides an understanding of the importance of financial development in economic growth.

2.3 Theory of financial intermediation

Funds can move from lenders to borrowers by a second route, called indirect finance because it involves a financial intermediary that stands between the lender-savers and the borrower-spenders and helps transfer funds from one to the other. A financial intermediary does this by borrowing funds from the lender or savers and then using these funds to make loans to borrower-spenders. For example, a bank might acquire funds by issuing a liability to the public (an asset for the public) in the form of savings deposits (Mishkin, 2004).

Financial intermediation theory was first formalized in the works of McKinnon (1973) and Shaw(1973) they see financial markets as playing a pivotal role in economic development, attributing the differences in economic growth across countries to the quantity and quality of services provided by financial institutions. This contrasts with Robinson (1952), who argued that financial markets are essentially handmaidens to domestic industry, and respond passively to other factors that produced cross-country differences in growth.

The Robinson school of thought therefore believes that economic growth will lead to the expansion of the financial sector. He attributed the positive correlation between financial development and the level of real per capital GNP to the positive effect that financial development has on encouraging more efficient use of the capital stock.

In addition, the process of growth has feedback effects on financial markets by creating incentives for further financial development. McKinnon's (1973) thesis is based on the complementarily hypothesis, which in contrast to the neo-classical monetary growth theory, argued that there is a complementarily between money and physical capital, which is reflected in money demand. According to McKinnon (1973), complementarily links the demand for money directly and positively with the process of physical capital accumulation because "the conditions of money supply have a first order impact on decisions to save and invest". In addition, positive and high interest rates are necessary to encourage agents to accumulate money balances, and complementarily with capital

accumulation will exist as long as real interest rate does not exceed the real rate of return on investment.

Furthermore, the lumpiness of investment expenditure implies that aggregate demand for money will be greater, the larger the proportion of investment in total expenditures. Shaw (1973) proposes a debt intermediation hypothesis, whereby expanded financial intermediation between savers and investors resulting from financial liberalization (higher real interest rates) and development, increase the incentive to save and invest, stimulates investments due to an increased supply of credit, and raises the average efficiency of investment. The view stresses the importance of free entry into and competition within the financial markets as prerequisites for successful financial intermediation (Shaw, 1973).

2.4 Functions of Financial System

The main functions of financial systems are to provide the mechanisms by which funds can be transferred from units in surplus to units with a shortage of funds in order to directly or indirectly facilitate lending and borrowing. Enable wealth holders to adjust the composition of their portfolios, provide payment mechanisms and provide mechanisms for risk transfer. There are many channels through which financial institutions affect growth. Banks in particular perform some very important functions for society and, in the process, significantly influence major economic variables (M. Buckle & E. Beccalli, 2011).

So, functions of the financial system are briefly discussed as follows:

(A) Mobilization and Allocation of Savings

The mobilization of savings is perhaps the most obvious and important function of the financial sector. The provision of savings facilities or transaction bank accounts enables households to store their money in a secure place, and allows this money to be put to productive use i.e. lent to individuals or enterprises to finance investment, thus encouraging capital accumulation and promoting private sector development.

Lack of access to secure savings facilities leads people to save in physical assets such as jewellery, or store their savings at home. Bringing these savings instead into the financial sector where they can be utilized productively, would by itself make a significant contribution to growth. In addition, the returns on investment can create positive expected returns for the savers, which may in turn increase savings.

It can also facilitate the development and adoption of better technologies. McKinnon (1973) explained this with an illustration of a farmer who cannot afford a particular investment out of his own savings – he needs to borrow in order to buy some piece of equipment (i.e. to invest in “new technology”) which would increase his productivity, and enable him to earn a higher income thereafter. Thus by mobilizing savings, and hence increasing the availability of credit, financial intermediation facilitates investment in new technologies across the economy, increasing overall productivity.

(B) Risk management

Many projects or enterprises require a medium to long-term commitment of capital, whereas most savers prefer to have the option to draw on their savings, or move them into another investment opportunity, should the need arise i.e. they like their savings to be ‘liquid’. Because banks and other financial intermediaries combine many households’ savings, and because savers usually won’t all want to withdraw their money at the same time, this allows financial intermediaries to simultaneously provide medium to long-term capital for investment, and liquidity for savers (e.g. Levine, 1991). By doing so, they help to ensure that capital is allocated to the best projects, even if they require a long-term financial commitment (Bencivenga & Smith 1991). They can also affect the rate of technological change if long-term commitments of resources to research and development promote technological innovation. As these factors serve to increase the return on savings, they may also increase savings and capital inflows.

Investing in an individual project is riskier than investing in a wide range of projects whose expected returns are unrelated. As savers generally dislike risk, financial intermediaries

that facilitate risk diversification – such as banks and stock exchanges - allow investments to be made in riskier projects with higher expected returns in aggregate (Saint-Paul, 1992, and Obstfeld, 1994). This again increases overall investment returns, and improves capital allocation, with a subsequent impact on growth. Risk diversification can also increase technological change.

Innovation is risky – many innovations will fail. However, the ability to diversify risk by investing in many different innovation-based enterprises may make investments in otherwise prohibitively risky enterprises possible. So by making more capital available to innovators, financial intermediaries that facilitate diversification may also increase technological change and thus economic growth (King & Levine, 1993).

(C) Acquiring information

Individual savers are unlikely to have the time or capacity to collect process and compare information on many different enterprises, managers and market conditions before choosing where to invest. Thus high information costs may prevent capital from flowing to its highest value use. In addition, they will be less keen to invest in activities about which they have little information. So the creation of financial intermediaries such as banks and fund managers, who will collect this information on behalf of many investors, and share the costs of doing so between them, will improve resource allocation and increase investment (though in developing countries, financial institutions may have only limited information on investment opportunities, as much of the economy is informal). These intermediaries can facilitate selection between projects on the basis of informed judgements about expected returns, thus weeding out the weakest projects and ensuring that capital is allocated optimally (Greenwood & Jovanovic, 1990). They may also increase the rate of technological progress by identifying and thus allocating capital towards those innovations with the best chances of succeeding (King & Levine, 1993).

(D) Monitoring borrowers, and exerting corporate control

Similarly, the ability of financial intermediaries to monitor the performance of enterprises on behalf of many investors – who would not otherwise have the resources to do so individually – and to exercise corporate control (e.g. lenders holding meetings with borrowers to discuss business strategy), helps to ensure that investors receive returns that properly reflect the enterprise's performance (i.e. ensures they are not being defrauded by the firm's managers as a result of their lack of information), and creates the right incentives for the managers of the borrowing enterprises to perform well. Thus financial arrangements that improve corporate control tend to promote faster capital accumulation and growth by improving the allocation of capital (Bencivenga and B. Smith 1991).

(E) Facilitating exchange

Last but not least, the financial sector facilitates transactions in the economy, both physically by providing the mechanisms to make and receive payments, and by reducing information costs in the ways outlined above. So by providing financial intermediation in this way, the financial sector reduces transactions costs, and facilitates the trading of goods and services between businesses and households. In doing this, the financial sector allows greater specialization which in turn facilitates productivity gains and allows more technological innovation and growth. So anything that reduces transactions costs and better facilitates exchange of goods and services whether it be faster payments systems, more bank branches, or improved remittance services will help to promote growth. This set of ideas dates back to Adam Smith (1776) who argued that workers were much more likely to identify more efficient working methods and processes if they were focused on one particular endeavor, and that the division and specialization of labor was therefore the principal factor underlying productivity improvements. Smith phrased this in terms of the way that money reduces transactions costs compared to barter, but it is equally valid in relation to other mechanisms that reduce transactions costs.

2.5 Banking Sector and Economic Development

Samson and Abass (2013) asserted that the development of banking and growth of modern economies seems inseparable. Until the late seventh century, there had existed no modern banking institution anywhere in the world, and there had no modern developed economy. There are many factors which determine the level and interest rate of development of an economy. These include the natural resources endowment, supply of skilled labour and, of course, capital.

Capital is critical factor required in the process of economic development. This includes real capital such as machineries and equipment and financial capital. The quantum of financial capital required before there could be any meaningful economic development also underscores the importance of banks. An individual's savings are not usually large enough to procure all his needed resources for development. The saver may not also possess the ability and the initiative that investment calls for. The banks therefore, aggregate the small savings of the individuals and hold these, away from the consumption, ready for investment. Consequently; investment in large physical projects is possible because qualified investors have access to the substantial stock of funds in temporary residence with the banks. This inter-mediation function of the banks facilitates development as it encourages savings and investments both of which are economically very rewarding. Banks also influence the quantum of purchasing power available for the investment and consumption expenditures.

The banks do this through their power to expand or contract credit. By their policies, banks also affect (e.g. prices of the various financial claims) the direction of funds to alternative

uses. The banks determine whether credit will be available for financing investment in agriculture, industry or consumption. How banks perform this role affects the pace and pattern of development in different sectors of the economy. Banks are very different from other financial intermediaries because of the “high degree of liquidity” of their demand deposits as well as their ability to “create” and “destroy” money. In a modern economy, the greater proportion of the money supply is deposit money created by commercial banks. Banks, as a group, therefore constitute the principal supplier of the medium of exchange (Samson and Abass, 2014).

2.6 Supply-Leading Vs Demand Following Hypothesis

One question which has remained unanswered in the literature is whether the policy-makers should first pursue financial development, or economic growth, or whether they should pursue both financial development and economic growth at the same time. In other words, between financial development and economic growth, which sector leads and which one lags in the dynamic process of economic development? There are two views exist in the literature. The first view argues that financial development, which results from financial liberalization leads to economic growth (i.e. McKinnon, 1973; Patrick, 1966; Fry, 1973). The second view maintains that it is economic growth that leads to financial development and that where there is economic growth financial development follows (i.e. Robinson, 1952).

The proponents of supply leading hypothesis believe that the activities of the financial institutions serve as a useful tool for increasing the productive capacity of the economy. They opine that countries with better developed financial system tend to grow faster. Early economists like Schumpeter (1911) have strongly supported the view of finance led causal relationship between finance and economic growth. He observed that financial markets (banks in particular) play a significant role in the growth of the real economy by

channeling funds from savers to borrowers in an efficient way to facilitate investment in physical capital, spur innovation and the 'creative destruction process'. He further contends that entrepreneurs require credit in order to finance the adoption of new production techniques and banks are viewed as key agents in facilitating these financial intermediating activities and promoting economic development.

In contrast to the supply leading thesis, the demand following thesis argues that financial development primarily follows economic growth and that the engines of growth must be sought elsewhere. Rising incomes from the agricultural or rural sector provide funds for which the financial intermediaries exist to service. Economic growth provides the demand which the finance sector fulfills.

The proponents of this hypothesis believe that postulate that economic growth is a causal factor for financial development. According to them, as the real sector grows, the increasing demand for financial services stimulates the financial sector (Gurley & Shaw 1967). Robinson (1952) was of the opinion that economic activity propels banks to finance enterprises. Thus where enterprises lead, finance follows.

Following the same line of argument was Goldsmith (1969) who used an alternative view of emphasizing the role of capital accumulation in economic growth. According to him, overall financial development matter for economic success as it lowers market friction which increases the domestic savings rate and attracts foreign capital. To him, financial policies such as direction of credit to sectors itself do not seem to matter much. He is of the opinion that policy makers may achieve greater returns by focusing less on the extent to which their country is bank based or market based and more on legal, regulatory and policy reforms that boost the functioning of the markets and banks. Similarly, Lucas (1988) believed that economists have badly overstressed the role of financial factors in economic growth. In essence, banks only respond passively to industrialization and economic growth.

Moreover, Gurley and Shaw (1955) contend that if income grows at a warranted pace, then the demand for financial assets also grows at a specifiable pace. In addition, there is a transactions demand for money to keep up with growing income. The accumulation of assets and rise in income stimulate demand by spending units for financial services in increasing variety. Financial development therefore follows economic development. Economic growth causes financial institutions to change and develop, and financial as well as credit markets to grow. Financial development is thus demand-driven. As the growing scale of economic activities requires more and more capital (liquid and fixed), institutional raising and pooling of funds for industry are substituted for individual fortunes to start up enterprises, and for retained profits for economic expansion (Gurley and Shaw 1955).

2.7 Indicators of Banking Sector Development

To assess the development of the banking sector their development indicators has been employed to find the relationship between banks and economic growth. These indicators are discussed here under.

2.7.1 Deposit

As Depti and Mamta (2014) noted the saving rate of any country is an important indicator of economic development since the domestic saving rate is directly related with the investment rate and the lending capacity of the banking system. Banks use the deposited money by the public and other depositors (Companies, other banks, Government, other

financial institution etc.) for credit creation in the economy which results in increasing GDP. Saving and investment are two key macro variables with micro foundations, which play a significant role in economic growth (Depti and Mamta, 2014). Giving further support to this line of argument, the endogenous growth theory argues that a higher savings rate leads to higher economic growth. Moreover, mobilization of savings is one of the major functions of financial institutions. By mobilizing the savings of millions of savers in an economy and the channeling of same to the deficit spending units, the funds or capital needed for economic growth and development is enhanced (Samson and Abass, 2013). Crockett (1970) noted that the activities of commercial banks as engine of growth of the economy could better be seen through the performance of their main function which include taking of deposits from the general public, providing account keeping and money transmission services. Indeed, in an efficiently functioning financial system, the size of a bank's business, or that of any other financial intermediary, depends on its ability to attract funds in competition with other institutions. This ability will depend on the attractiveness to depositors of the package of services it offers. This package will consist of the interest rate paid, security offered, convenience in account management facilities, financial advice etc. (Crockett, 1970).

2.7.2 Loan and Advances

As Facilia (2011) noted commercial banks are the most important savings, mobilization and financial resource allocation institutions. Consequently, these roles make them an important phenomenon in economic growth and development. Lending practices in the world could be traced to the period of industrial revolution which increase the pace of commercial and production activities thereby bringing about the need for large capital

outlays for projects Many captains of industry at this period were unable to meet up with the sudden upturn in the financial requirements and therefore turn to the banks for assistance.

Therefore, lending which may be on short, medium or long-term basis is one of the services that commercial banks do render to their customers. In other words, banks do grant loans and advances to individuals, business organizations as well as government in order to enable them embark on investment and development activities as a mean of aiding their growth in particular or contributing toward the economic development of a country in general (Facilia , 2011). With similar line of argument, Ibru (2008) highlighted the contributions of banks to the economy. She said that the intervention of banks in the provision of funds for different stages of business pursuits is a boost for the economy.

According to Bhosale (2014) just as capital is one important factor that must grow if the economy is to develop, enterprise is another important factor that must grow and help the economy to develop. This requires the expansion of the entrepreneurial class which is willing to accept risks and challenges. Many times, it so happens that there are people who have the qualities of a promising entrepreneur, but they do not have the money or capital to put their plans into practice. Hence, banks have an important function to perform. They can scrutinize and select the plans of enthusiastic entrepreneurs and make finance available to them. Thus, by promoting enterprise, banks can help rapid economic development.

Banking industry is among the most important financial institutions in the economy of any nation. According to Rose (1999), they are the principal source of credit (loan able funds) for millions of households (individuals and families) and for most local unit of government (school districts, cities, countries, etc). She further maintained that for small local businesses ranging from grocery stores to automobile dealers, banks are often the major source of credit to stock them with merchandise or to fill a dealer's show room with new cars.

Samson and Abass (2013) noted that Principal amongst the functions performed by the commercial banks are to ensure the adequacy of the stock of money to service the needs of the economy and facilitate the transfer of money between economic units. This transfer is usually from areas of surplus to areas of deficits/needs.

2.7.3 Size of Banking Sector (Assets)

There is common agreement that the ultimate purpose of the financial sector should be to serve the real economy. A country's financial sector is important for real economic activity as the size of an efficient financial sector not only affects the level of output by allocating productive capital more efficiently but may also contribute to economic growth (Levine, 2005; King & Levine, 1993). Since the size of the bank is related to the size of firms and households that need finance. In contrast, Arcand *et al* (2012) state that more finance is not always better and there might be (negative) side effects when the financial sector becomes too large. These authors indicate that there may be a threshold above which financial development no longer has a positive effect on economic growth and may harm the economy and society as a whole (Arcand *et al.*, 2012). For example, when the financial sector grows too large, it might lead to a misallocation of resources and cause costly crises (Arcand *et al*, 2012).

2.8 Empirical literature

To start with the empirical discussions from the work of King and Levine (1993) they have been used an endogenous growth model to examine how financial systems affect economic growth. According to the findings of their study, better financial systems improve the possibility of successful innovation, and there by accelerate economic growth.

In contrast, financial sector distortions reduce the rate of economic growth by reducing the rate of innovation. The study, therefore, concludes that financial systems are important for productivity, growth, and economic development (King and Levine, 1993). Regarding supply-leading hypothesis, Choe and Moosa (1999), studied the relationship between the development of financial systems and economic growth in Korea, conclude that financial development generally leads to economic growth, and that financial intermediaries are more important than capital markets in this relationship.

In relation to demand-following hypothesis, Favara (2003) conducted the panel estimation technique and reported that relationship between financial development and economic growth is at best weak. To him, there is no indication that finance spurs economic growth, rather for some specifications, the relationship is puzzlingly negative. Therefore, the effect of financial development on economic growth is ambiguous and not robust to alternative dynamic specifications. This he attributed to the fact that financial development does not have a first order effect on economic growth.

Güryay and Şafakli (2007) examines the relationship between financial development and economic growth in Northern Cyprus from 1986 to 2004 by employing Ordinary Least Square Estimation Method (OLS). The result showed that there is a negligible positive effect of financial development on economic growth. On the other hand Granger causality test showed that financial development does not cause economic growth, whereas economic growth was found to cause development of financial intermediaries.

More specifically related empirical evidences, Aurangzeb (2012) studied the contributions of banking sectors on the economic growth in Pakistan, he used deposit, investment, advances, profitability and interest earning of the commercial banks for the period of 2001 to 2010. The statistical result of his study shows that deposit, investment, loan and advances, profitability and interest earning were all significant with positive impact on the economic growth of the Pakistan. Moreover, the granger causality test of his study confirmed the bidirectional causal relationship of profitability, deposit and loan and advance with economic growth of the country, while unidirectional causal relationship of investment and interest earning was found with economic growth.

Ali (2012) empirically investigates the relationship between Banking Sector Development and Economic Growth in Lebanon over the period of 1992-2011. The variables being used for the study were deposits, banking sector size (i.e. assets), interest rate spread, credit to local private sector, and concentration. The statistical result of his study shows that both deposit growth and credit to local private sector impact significantly economic growth.

Conversely, the banking sector size (i.e. Assets), efficiency (interest rate spread), and concentration do not impact significantly economic growth. Moreover, the results provide support for the demand-following hypothesis regarding the link between financial sector and economic development in Lebanon. As well, Jaiyeoba et Al (2013) studied the impact of commercial banks on Malaysian economic development, the study covered 10 commercial banks and for the period of six years, from 2007 to 2012. Variables used for the study are profitability, loan and advances, assets and deposits. The statistical result of their study shows that the profitability and loan and advances have positive and significant contributions to the Malaysian economic development, while commercial banks deposit and asset does not have significant contribution to the Malaysian economic development.

In Ethiopian context, Roman (2012) examined whether a long-run relationship between financial development and economic growth exist in Ethiopia. Co-integrated Vector Autoregressive (CVAR) approach has been employed to assess how the financial sector contributes to growth. The study further used the granger causality test so as to find the

direction of causality between financial development and economic growth. So, the findings supported that the existence of a uni-directional causality from economic growth to financial development. The empirical evidence, in addition, shows the presence of positive and significant long-run relationship between financial development and economic growth and an insignificant effect in the short-run.

Melkamu (2015), empirically investigate the impact of commercial banks' development in the Ethiopian economic growth. ordinary least squares regression (OLS) analyses were performed to assess the impact of commercial bank development in Ethiopian economic growth .The researcher used 14 years 8 commercial banks data .The results of granger causality test to know causality among variables and found that deposit has granger cause economic growth, economic growth granger cause loan and advances and no casual relationship is found among economic growth and asset. The study adopted different analysis techniques include descriptive statistics and multivariate regression analysis. This study found out that a positive and significant relationship among economic growth, deposit and loan and advances where as negative and significant association ship between economic growth and bank size i.e. asset.

Hailay, 2013 empirically investigate the nexus between banking sector development proxy by interest rate margin and economic growth in Ethiopia over the period 1975-2011. The researcher applied Johnson approach to Co-integration and Error Correction Model to investigate the long run and short run impact of financial development on economic growth. Economic growth becomes slow when transaction cost higher and a small share of savings is flow in to investment due to the inefficiency of the bank sector development. Ethiopian banking sector development remains inefficient with high interest rate margin hinder economic growth.

2.9 History and Characteristics of Banking Sector in Ethiopia

One can trace the history of using modern money in Ethiopia to more than 2000 years. This had flourished in what is called the Axumite era which can stretch from 1000BC to around 975 AD. Leaving that long history aside, modern banking in Ethiopia started in 1905 with the establishment of *Abysinian Bank* based on a 50 years agreement with the Anglo-Egyptian National Bank. In 1908 a new development bank (named *Societe Nationale d’Ethiophe Pour le Development de l’ Agriculture et du Commerce*) and two other foreign banks (*Banque de l’Indochine* and *the Compagnie de l’ Afrique Oreintale*) were also established. These banks were criticized for being wholly foreign owned. In 1931 the Ethiopian government purchased the *Abysinian Bank*, which was the dominant bank, and renamed it the ‘Bank of Ethiopia’ – the first nationally owned bank on African continent.

During the five-years of Italian occupation there was an expansion of banking activity. After independence from Italy’s brief occupation (of 1933-1941) where the role of British was paramount owing to its strategic consideration in World War II, Barclay’s bank had established and was in business in Ethiopia from 1941 to 1943 , the Ethiopian government established the ‘State Bank of Ethiopia’. The establishment of this Bank by Ethiopia was a painful process since Britain was against it for an interesting neo-colonial story. This bank

was operating both as commercial and central bank until 1963 when it was dissolved into today's National Bank of Ethiopia (the central bank, re established in 1976) and 'The Commercial Bank of Ethiopia', CBE henceforth. After this period many other banks were established.

All privately owned financial institutions were nationalized on 1 January 1975. The nationalized banks were reorganized and one commercial bank (the Commercial Bank of Ethiopia), a National Bank (recreated in 1976), two specialized banks (the Agricultural and Industrial Bank – renamed recently as the Development Bank of Ethiopia; and a Housing and Saving Bank – renamed as the Construction and Business Bank, currently this bank also merged with commercial bank of Ethiopia (CBE)) as well as one insurance company – Ethiopian Insurance Company were formed. Following the regime change in 1991 and the liberalization policy in 1992, these financial institutions were reorganized to work on market-oriented policy framework. In 1994 the first private bank started awash international bank (AIB) (Alemayehu, 2006).

Currently, the banking sector in Ethiopia consists of 2 public banks and 16 private banks. It is dominated by the Commercial Bank of Ethiopia, which controls 70% of the total assets in the country, according to the IMF. The other 30% is controlled by the other private banks. The reason for this success of the CBE is that it is a fairly well-run and efficient bank, and provides an element of security in that it is run by the government. It should be noted that the financial sector in Ethiopia is highly regulated and completely closed from foreign companies. The complete closure of the financial sector to foreign companies has limited the opportunities for competition in the financial sector. The Development Bank of Ethiopia (DBE) extends short, medium and long-term loans for viable development projects, including industrial and agricultural projects. It also provides other banking services, such checking and saving accounts to its clients. It provides long-term loans for construction plants, schools, acquisition or maintenance of dwellings, and real estate development. In addition, it offers all other commercial banking services to business. (Deloitte. June 2016).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Methods

Well designed and implemented quantitative research has the advantage of making generalizations to a wider population from the sample. To enhance the generalization of findings, quantitative research approach follow 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. Research methods are the techniques used to collect the necessary data. Quantitative research can be used in response to relational questions of variables within the research.

Thus, in this study, a vector autoregressive approach (VAR) approach was adopted using granger causality test to investigate banking sector development on economic growth in Ethiopia in the period between 2001 and 2016.

3.2 Source of Data

For this study, secondary data were employed based on panel data framework for the total number of 5 commercial banks covering the period from 2001 and 2016. The data were obtained from national bank of Ethiopia (NBE) and Ministry of Finance and Economic Cooperation (MoFEC).

3.3 Population of the Study

Population in statistics is the specific population about which information is desired. It is a well defined or set of people, services, elements, events, group of things or households that are being investigated. Therefore, the population of this study consists of all banks which are operating in the Ethiopian banking industry. However, there are 17 Commercial banks in Ethiopia. Of which 1 are public owned bank and 16 are private owned banks.

However, for the purpose the study and availability of the data, only five commercial banks that are operational before 2000 were taken. From this four were private and one is government owned commercial banks .i.e. Commercial Bank of Ethiopia (CBE), Awash International Bank S.C (AIB), Dashen Bank S.C (DB), Wegagen Bank S.C (WB) and United Bank S.C (UB).

3.4 Data Collection Instruments

In order to analyze the effect of banking sector development on economic growth in Ethiopia, audited financial statements five selected banks for the period from 2001 and 2016 has been collected. The secondary data were collected through structured document review from the records held by NBE and MoFED.

3.5 Model Specification

In order to investigate the relationship between banking sector development and economic growth, we make use of the Granger causality test. The Granger causality test is based on the vector auto regression model between banking sector development and economic growth.

The major dependent variable i.e. economic performance/growth indicator is gross domestic product (GDP). The major determinants (independent variables) are bank deposit liabilities, loan and advances and banking sector assets . In this study the following baseline model was adopted:

$$LRGDP_{ij} = \beta_0 + \beta_1 LDEPO_{ij} + \beta_2 LLOAD_{ij} + \beta_3 LASSE_{ij} + \beta_4 LEXPO_{ij} + \beta_5 GOEX_{ij} + \epsilon_{ij}$$

Where:

RGDP_{ij}= Real Gross domestic product i.e. an indicator of economic growth ;

β₀: Intercept;

DEPO_{ij}: banks' deposit liabilities from i to j

LOAD_{ij}: banks' Loan and Advances from i to j,

ASSE_{ij}: banks' asset from i to j

EXPO_{ij}: Export from i to j

GOEX_{ij}: Government expenditure from i to j

ε_{ij}= Error term from i to j

3.6 Description of Variables

The present study has one dependent variable (i.e. RGDP), three major independent variables namely deposits, loan and advances and assets. Therefore, they are briefly described as follows.

3.6.1 Dependent Variable

- **Real Gross Domestic Product (RGDP):** which is a measure of a nation's economic performance –economic growth in this instance.

3.6.2 Independent Variables

- **Deposits:** deposits are the sum of demand deposit, savings and time deposits; it provides an alternative to the broad money ratio especially when dealing with developing countries. The ratio measures the degree of monetization in the economy as well as the depth of the financial sector while it also shows an expansion of payment and saving functions.
- **Loans and advances:** De Gregorio and Guidotti (1995) state that loan and advances as percent of GDP has an advantage over monetary aggregates measures, because it represents more accurately the actual volume of funds channeled into the private sector and thus, is more directly linked to investment and economic growth. A higher ratio is an indication of greater financial intermediation development. This ratio indicates the importance of the role played by the financial sector, especially the deposit money banks, in the financing of the economy (Levine,2003); it also measures the activity of financial intermediaries in one of their primary function of channeling savings to investors. These indicators are commonly referred to and used in the literature (e.g. Aziakpono, 2003; King and Levine, 1993; Hakeem, 2009); this informed the choice of these measures in this study.
- **The Size of banks (assets):** this particular variable is considered to assess the impact of the size of banking sector on economic growth, and if this large size represents an added value (or burden?) for economic development. To measure the size of the banking system, in order to assess whether a country's banking system is too big, a

country's banking assets divided by the country's GDP is commonly applied as a general yardstick (Levine, 2005).

3.6.3 Control variables

- **Exports:** The term export means sending of good and service produced in one country to another country. As a measure of exports, the study uses the exports of goods and services in relation to GDP. Export is one of the factors, considered even in the traditional Keynesian theory that can facilitate economic growth. Empirical studies have confirmed that export positively affects economic growth.
- **Government expenditure:** Government expenditure includes all government consumption, investment and transfer payment. The government has an important role for the establishment of framework for private sector development in every economy. However, numerous theoretical and empirical researches suggest that the larger government consumption the less developed will be the financial system. Therefore, general government consumption is usually used as a control variable when depicting economic growth.

Table 3.1: Definition and expected sign of variables

Variable	Measurement	Expected sign
Bank Deposits	Total deposit liabilities of commercial Banks to GDP	+
Loan and Advances	Total loan and advances to GDP	+
Assets	Total assets to GDP	+

Export	Export to GDP	+
Government expenditure	Government expenditure to GDP	+

3.7 Data Analysis Procedures

The data collected with the use of secondary method of data collection are subjected to statistical analysis with the use of both model and descriptive statistics. Based on this, descriptive analysis, unit root, Granger Causality tests and ordinary least squares regression (OLS) analyses were performed for this study to investigate whether their exist long run or short run relationship between banking sector development and economic growth in Ethiopia.

3.7.1 Unit Root Tests

A data considered to be stationary if it's mean and variable are independent of time. If the data is non-stationary, that is, having a mean and or variance changing over time, it is said to have a unit root. If a data is non-stationary, the regression analysis carried out in a conventional way will produce spurious results. A non-stationary data can be converted into a stationary through differencing.

3.7.2 VAR

A VAR describes the dynamic evolution of a number of variables from their common history. The use of co integrated VAR model helps account for spurious correlation and

exogeneity bias as it is designed for non-stationary time's series and requires no endo-exogeneous division of variables. It allows feedback and dynamic interrelationship across all the variables in the system and appears to be highly competitive with the large-scale macroeconomic models in forecasting and policy analysis (Rahman, 2004).

3.7.3 Granger Causality Test

The concept of granger causality relates to whether one variable can help improve the forecast of another. If event *A* happens before event *B*, then it is *possible* that *A* is causing *B*. However, it is not *possible* that *B* is causing *A*. In other words, events in the past can cause events to happen today. Future events cannot (Gujarati, 2004). In other words, it indicates causality between two variables *y* and *x* as follows: *y* causes *x* if the predictability of *x* increases when *y* is taken into consideration.

This study, therefore, is conducted Granger Causality using VAR approach to find out if the variables can be predicted from others, more specifically to know whether asset, deposits, and loans and advances of the banks in Ethiopia are used to predict the GDP and vice- versa.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSIONS

4.1 Descriptive Analysis

As stated above, the objective of this study is to examine the bank sector development and economic growth in Ethiopia from the period between 2001 and 2016. The researcher used the RGDP as a measure of economic growth in Ethiopia whereas the study has considered three major independent variables as an indicators of development of banks and these are taken just to know the impact of banks sector development in Ethiopian economic growth. Additionally, the study has considered two control variables namely government expenditure and exports since all are affecting the RGDP either negatively or positively.

As stated in the table presented in the annex (Annex 2) and in figure presented below, in the sated period, the growth of banking sector (peroxide asset, deposit as well as loan and advance) and Ethiopia's real GDP show increment with similar trend. This could clearly show that the increment in the variable (indicating banking sector development) contributing to the country's economic growth or there is positive relationship between banking sector development and RGDP.

Similarly in the growth of the level of export and government expenditure have similar trend with the growth of country's RGDP. This is in line with the existing economic theory where there is positive relationship between export and government expenditure and economic growth.

In 2001 the amount of the sum of asset, deposit and loan and advance of the five commercial banks was more than 24.2 billion Birr, 19.6 billion Birr and 12.41 billion Birr respectively while the amount of RGDP was more than 198.3 billion. After five year the amount of asset increased to more than 47.2 billion Birr while the amount of deposit and load and advance of those banks increased to more than 37.5 billion birr and nearly 17 billion Birr in 2006. Similarly, in the same year, the amount the country's RGDP reached more than 277 billion Birr.

Later in 2011 the amount of RGDP increases by nearly 72% to reach more than 475 billion Birr. In similar period the amount asset, deposit and load and advance increase to reach more than 154 billion Birr, 116 billion Birr and 52 billion Birr respectively in 2011.

In the same way, amount of asset, deposit and load and advance continued to increase in coming years. In 2016, the amount asset was more than 476 billion Birr while the amount of deposit and load and advance reached to 358 billion Birr and nearly 183 billion Birr. In the same way the amount of RGDP increases to reach to more than 747 billion Birr in 2016.

On the other hand control variables that are export and government expenditure shows the similar incremental trend within on RGDP.

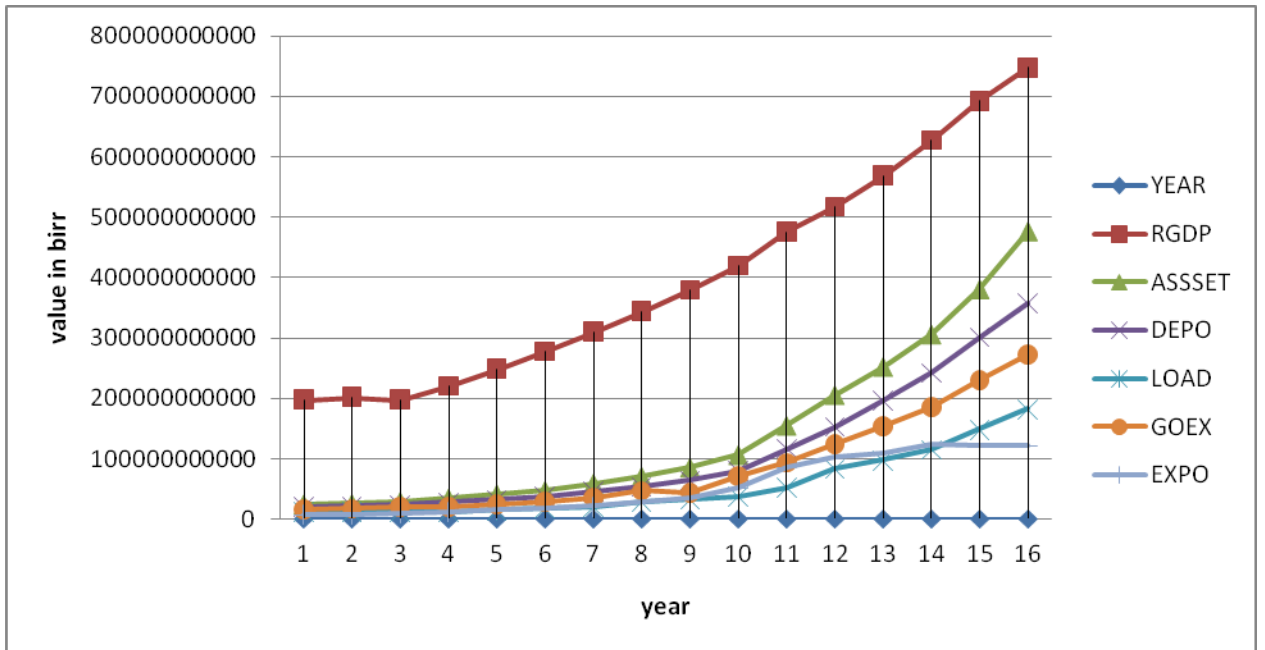


Figure 4.1: Bank sector development and economic growth in Ethiopia (2001-2016)

Source: Own computation based data obtained from NBA and MoFEC

4.2 Empirical analysis

This part presents the results of the regression model and their corresponding discussions the relationship between bank development and economic growth using annual data from 2001-2016 in Ethiopia. Prior to the analysis of regression model, unit root test and granger

causality tests. It also presents the analysis of the collected empirical data, portrays the results, and explains the impacts of banks' development in Ethiopian economic growth.

4.2.1 Data Testing

Test data is the data is used in test of a software system in order to confirm the expected result. The most critical vector auto regression model and other relevant tests include unit root tests and granger tests were tested in the following subsections. These are Normality, multicollinearity, heteroskedasticity, and model specification tests have been conducted.

- ***Test of Normality***

Normality test of data is applied to determine whether a data is well-modeled by a normal distribution or not, and to compute how likely an underlying random variable is to be normally distributed. In this study a test for normality of the residual was performed with the aid of graphical methods. For graphical method was used histogram test. The result of tests indicated the residual is normally distributed.

- ***Test of Multi Co Linearity***

Multicollinearity means that there is linear relationship between explanatory variables which may cause the regression model biased (Gujarati, 2003). In other word, Multicollinearity referees to the situation where two or more of the predictors in a regression model are moderately or highly correlated. It implies that one can be linearly predicted from the others with a substantial degree of accuracy. A number of detection method whether there exist multicollinearity. From them a Variance Inflation Factor (VIF) is frequently applied. In this diagnostic test, a VIF value above 10 indicates the existence of a multicollinearity problem.

Similarly, in this study VIF was implemented whether their exist multicollinearity between indendent variables. Accordingly, the result indicates that there exist multicolllinearity problem in export. Since one of the solution for dealing with existence of multicollinearity

is dropping the collinear variable from the model. In order to decide which variable to drop from the model, a pair-wise correlation test performed. Thus based on this result, a variable for export is drop from the estimation due to co linearity.

- ***Tests for Heteroskedasticity***

Heteroskedasticity is a systematic pattern in the errors where the variances of the errors are not constant (Gujarati, 2003). There are different diagnostic tests available for testing hetroscadasiy. In this study, Cook-Weisberg test of test of testing heteroskedasticity has been performed.

However, the test result indicates that there exist heteroskedasticity in the residual. Thus, the problem was can be true if and only if the p-value is less than 0.05 this indicates that we would have to rejecting the null hypothesis of has heteroskedasticity problem. As it is the test results of statistically significant, this implies that the regression of the residuals on the predicted values significant heteroskedasticity because its corresponding p- value is less than 0.05. To deal with this problem the study used a robust standard error in performing a regression.

- ***Test for Serial-correlation***

Serial correlation/autocorrelation is the violation of assumption stating the error term is uncorrelated with each other. It referees to the relationship between a given variable and itself over various time intervals and found in repeating patterns, when the level of a variable affects its future level. When serial correlation exists, it causes the estimated variances of the regression coefficients to be biased and this leads to unreliable hypothesis testing.

In this study, Wooldridge test for autocorrelation was applied. The rest indicate that there exists serial correlation in the model. To deal with this a generalized least square (GLS) method was applied.

- *Test of Unit Root*

In probability theory and statistics, a unit root is a feature of some stochastic processes that can cause problems in statistical inference involving panel and time series models. A test of stationarity (or nonstationarity) that has become widely popular over the past several years is the unit root test.

The stationarity of data is important because it affects the long run relationship of the variables and model in general. The none stationary of the variables causes previous values of the error terms y_{t-1} to have none declining effect on the current value of y_t as time progresses which in turn leads to spurious regression.

There are various alternative applied in a unit root test. In this study Im-pesaran-shin root test was applied. The result confirmed that the data is On the level based non stationary except loan and advance.

Having established that variables are non stationary at levels, the next step or the solution is to difference them once. Thus, the result of the stationary test on first level is show that after being differenced once, all the variables are confirmed to be stationary.

Table 4.1: Stationarity Tests of all the variables at their levels and first difference

`variable	At levels	At first difference
	Im-Pesaran-Shin	Im-Pesaran-Shin
	p-value	p-value
RGDP	1.0000	0.0061
ASSE	0.4748	0.0000
DEPO	0.8666	0.0001

LOAD	0.0388	0.0000
GOEX	1.0000	0.0000

Source: Own computation based data obtained from NBA and MoFEC

4.3 Test of Granger Causality

Generally, the Granger Causality approach to the problem of whether 'x' causes 'y' is to see how much of the current 'y' can be explained by past values of 'y' and then to see whether adding lagged values of 'x' can improve the explanation. 'Y' is said to Granger-Caused by 'x' if 'x' helps in the prediction of 'y' or equivalently, if the coefficients on the lagged x's are statistically significant.

In this section, we employ the Pair-wise granger causality between RGDP and bank development indicator (deposit, loan and advance and asset).

Therefore, the pair wise granger causality results indicates loan and advance (LOAD) granger cause real gross domestic product (RGDP) but not the other way round. Therefore the direction of the relationship is LOAD → RGDP. However, as per the finding of the study, RGDP was not having a casual relation with ASSE, and DEPO in the stated period.

Table 4.2: pair -wise test for granger causality

panel VAR-Granger causality Wald test
 Ho: Excluded variable does not Granger-cause Equation variable
 Ha: Excluded variable Granger-causes Equation variable

Equation \ Excluded	chi2	df	Prob > chi2

ln_RGDPi j			
ln_ASSEi j	4.582	2	0.101
ln_DEPOi j	0.243	2	0.886
ln_LOADi j	6.720	2	0.035
ALL	14.130	6	0.028

ln_ASSEi j			
ln_RGDPi j	1.800	2	0.407
ln_DEPOi j	2.142	2	0.343
ln_LOADi j	5.509	2	0.064
ALL	8.497	6	0.204

ln_DEPOi j			
ln_RGDPi j	0.271	2	0.873
ln_ASSEi j	3.772	2	0.152
ln_LOADi j	2.191	2	0.334
ALL	6.375	6	0.383

ln_LOADi j			
ln_RGDPi j	1.242	2	0.537
ln_ASSEi j	3.548	2	0.170
ln_DEPOi j	9.511	2	0.009
ALL	16.283	6	0.012

Source: Own Computation (STATA 13)

4.4 Empirical Analysis and Discussions of Results

To identify the appropriate methodology, the study performed Hausman test. It is used to test the fixed-effect model versus the random effect model.

Thus based on the result of the Hausmann test (P=1.000) the appropriate estimation model decided to be Random effect estimator.

As can be seen from this table the model has an overall R² of 0.9911 indicating in overall terms the variables in the model are jointly significant.

Table 4.3: Random –effect GLS Regression

Random-effects GLS regression		Number of obs	=	96		
Group variable: BAID		Number of groups	=	6		
R-sq: within = 0.0000		Obs per group: min =		16		
between = 0.0000		avg =		16.0		
overall = 0.9911		max =		16		
		Wald chi2(4)	=	59553.69		
corr(u_i, X) = 0 (assumed)		Prob> chi2	=	0.0000		
(Std. Err. adjusted for 6 clusters in BAID)						

		Robust				
ln_RGDPi j		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]

ln_ASSEi j		-.002291	.0117927	-0.19	0.846	-.0254043 .0208222
ln_DEPOi j		.0136343	.0121306	1.12	0.261	-.0101412 .0374098
ln_LOADi j		.0023868	.0097971	-0.24	0.808	-.0215887 .0168151
ln_GOEXi j		.4618723	.0048412	95.40	0.000***	.4523837 .4713608
_cons		14.97179	.4011922	37.32	0.000	14.18547 15.75811

sigma_u		0				
sigma_e		.04343364				
rho		0	(fraction of variance due to u_i)			

Note: - ***significance both at 1% (also significant at 5% and 10% level)						

Source: Own Computation STATA 13

Generally, as can be observed from the above presented regression result, Government expenditure ($GOEX_{ij}$) found to be a significant factors affecting Ethiopian economic growth in the period between 2001 and 2016 at 1% level.

On the other hand, asset ($ASSE_{ij}$), deposit ($DEPO_{ij}$) and loan and advance ($LOAD_{ij}$) found to be statistically insignificant in affecting Ethiopia's economic growth in the indicated period both at 1%,5% and 10%.As can be understood from the result, based on coefficients the discussion of each variable is presented as follows.

Assets

The coefficient shows the tendency of an independent variable to respond against the dependent variable. Therefore the greater value of coefficient indicates a larger impact on dependent variable and vice versa. Thus, in this case, the estimated regression result shows that the P-value is 0.846. Therefore Bank Asset is found to be statistically in significant in affecting Real GDP. On the other hand the coefficient of the regression result revealed that there exist a negative relation between Bank's Asset and Real GDP in the stated period. This may shows that a mere expansion of such as branch may not necessary bring increment of Real GDP since Branch expansion is one of the important indication of increment of asset of Banks. Melkamu (2015) found the same result in their attempt to investigate impact of commercial bank development to in Ethiopia economic growth.

Deposit

In the same way, the estimated regression result shows that the P-value is 0.261. Therefore Bank deposit is found to be statistically in significant in affecting Real GDP. On the other hand the estimated coefficient of bank deposit ($DEPO_{ij}$) indicated that the bank deposit

affect Ethiopian economy growth performance positively. This outcome is consistent with the previous studies of Aurangzeb (2012) and mlkamu (2015) so the result suggested that when the amount of commercial bank's deposit increases the economic growth also increase.

The Increase of deposit accounts in the banks are able to collect deposits from a wider customer base hence increasing the amounts available to banks for lending. With increased lending levels in the country, more funds will be invested in different sectors hence positively impacting on the economic growth registered.

Loan and advance

Loan and advances are the estimated regression result shows that the P-value is 0.808. Therefore Bank loan and advance is found to be statistically in significant in affecting Real GDP. On the other hand the coefficient of the regression result revealed that there exist a positively relation between loan and advance and Real GDP in the stated period. Other empirical studies also found a positive relationship between RGDP and LAD includes melkamu (2015) *and* Aurangzeb (2012). This can be explained in such a way that the development of Banks can act as a catalyst to economic growth by allocating resources.

Many times, it so happens that there are people who have the qualities of a promising entrepreneur, but they do not have the money or capital to put their plans into practice. Hence, commercial banks have an important function to perform. They can scrutinize and select the plans of enthusiastic entrepreneurs and make finance available to them. Thus, by promoting enterprise, banks can help rapid economic development.

Government expenditure

Government expenditure proved to be the better determinant of economic growth in Ethiopia. The coefficient of this variable is strongly positive and statistically significant. As it is presented in the regression results its estimate of coefficient is 0 .4618723 and corresponding p-value is 0.0000 which is statistically significant since the p-value is less than at 5% even at1% significance level. To deal further, by looking at the sign of the

coefficient there is a positive relationship between the GOVEXP and RGDP this means that when the government expenditure is increased by 1% the RGDP will be increase by 46% showing that higher government expenditure may enhance overall performance of the economy. For instance, in an attempt to finance rising expenditure, government may increase public investment. Other empirical studies also found a negative relationship between RGDP and GOVE melkamu (2015).

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This chapter presents a conclusion and recommendation of the study by summarizing the finding. Indeed, keeping all other things are constant, in the relationship between banking development and economic growth there are financial development indicators that can influence economic growth of a country like Ethiopia. This study was conducted to investigate the impact of banks' development in the Ethiopian economic growth over the period of sixteen years from 2001 to 2016.

The study employed a random effect method to investigate at the key factors determining of selected as explanatory variable are asset ,deposit, loan and advance and government expenditure while RGDP is taken as dependent variable. For this study, Im-pesaran-shin root test, granger causality test and ordinary least square have been used. Therefore, Unit root test confirms non stationary of all variables except loan and advance, whereas the stationary of all variables at first difference.

The Granger-Causality test confirms unidirectional causal relationship of loan and advance with economic growth runs from loan and advance to economic growth. On the other side no causal relationship is found among another remaining variable and economic growth.

Regression results revealed that among development indicators of development of banks deposits and loan and advance important factors that positively relationship with RGDP but, they have in significantly influence the economic growth in Ethiopia in the stated period. The size of banks that was measured by their assets had negative and in significant association ship with the RGDP. With regard to control variables, government has positive significant relationship with RGDP in Ethiopia.

5.2 Recommendations

Based on the empirical analysis, the study provides the following recommendations;

1. As per the findings of the study, negative relationship between asset and GDP hence asset express based on bank size so the expansion of bank size or branch network is not important, it require deep empirical investigation. On the other hand further research has to be undertaken in order to see again the effect of the relationship between assets of banks and economic growth.

2. The deposits of banks found have to a positive relationship with economic growth. Following this, the researcher recommends that adequate efforts be made by banks to increase their level of deposits as that will help in increasing the nation's capital formation in turn economic growth will be enhanced.
3. A variable loan and advances shows positive influences on output. To fully realize the growth potentials of the Ethiopian economy the banks take appropriate measurement it is necessary to remove or to free from non-performing loans. Banks should strategize on how to attract and retain more deposits so as to further improve on their lending performance to meet the financial needs of economic units.
4. Finally, as per the findings of the study, government expenditure found have to a positive and significant association ship with economic growth. To improve government expenditures, the government of Ethiopia should encourage and increase funding of infrastructure development and other strategic economic sectors.

References

Alemayehu G (2006). "The structure and Performance of Ethiopia's Financial Sector in the Pre And Post-reform period with a Special Focus on Banking", Research paper No. 2006/112, UNU World Institute for Development Economics Research, Helsinki.

- Ali A., (2012). Banking Sector Development and Economic Research Journal of Finance and Economics ISSN 1450- Growth in Lebanon. International 2887 Issue 100.
- Arcand, J.L., E. Berkes and U. Panizza (2012). Too Much Finance? *IMF Working Paper* No.WP/12/161.
- Aurangzeb. (2012). Contributions of Banking Sector in Economic Growth : A Case of Pakistan. *Economics and Finance Review Vol. 2(6) pp. 45 – 54.*
- Aziakpono, M. (2003). Financial intermediation and economic growth in economic and monetary union: The case of SACU and CMA. Paper presented at the ESSA Conference, Lord Charles Hotel, Somerset West, 19 September 2003.
- Bencivenga & Smith; 1991, “Financial Intermediation and Endogenous Growth”, *Review of Economic Studies*, 58(2), pp. 195-209
- Bhosale J. P., (2014), Role of Indian Banking Sector In The Economic Growth And Development, *Ge-International Journal Of Management Research*, Volume -2, 142 Issn: (2321-1709)
- Carrie Williams, 2007, Research Methods. *Journal of Business & Economic Research*, 5(3),Grand Canyon University.
- Choe, C. and I.A. Moosa (1999), ‘Financial System and Economic Growth: The Korean Experience’, *World Development*, Vol. 27, No. 6, pp. 1069–82.
- Deepti S., and Mamta R. (2014), Impact of Saving Deposits of Commercial Banks on GDP. Research paper, Vol 4, ISSN-2249-555X.
- Deloitte. June 2016, Ethiopia Economic Outlook Poojasonaki
<https://www.quora.com/What-is-function-of-development-bank>
- Ecobank,2014.ethiopian banking sector liberalization can lift growth
 highlight
- Favara G. (2003) “An Empirical Reassessment of the Relationship between Finance and Growth” IMF Working Paper No: 03/123.
- Felicia O. (2012), Determinants of Commercial Banks’ Lending Behavior in

- Nigeria, *International Journal of Financial Research*, Vol. 2, No. 2.
- Frederic S. Mishkin.—7th ed. 2004, *The economics of money, banking, and financial markets*.
- Goldsmith, R.W. (1969). *Financial Structure and Development*. Yale University Press, New Haven, CT.
- Greenwood & Jovanovic; 1990, “Financial Development, Growth and the Distribution of Income”, *Journal of Political Economy*, 98(5, Pt.1), pp.1076-1107
- Gujarati, D. N. (2008). *Basic Econometrics*. 4th Edition, Boston: McGraw-Hill
- Gurley, J. & Shaw, E. (1967) “Financial Structure and Economic Development” *Economic Development and Cultural Change*, Vol. 15, No 3, pp 257-26.
- Güryay, E. & Şafakli, O. V. (2007). Financial development and economic growth: Evidence from Northern Cyprus. *International Research Journal of Finance And Economics*. Issue 8: 57-62.
- Hailay Tsigab, 2013 –Financial Development and Economic Growth Nexus –Evidence from Ethiopia (Johnson approach to co-integration)-*international journal of science and research (IJSR)* 2319-7064
- Ikhide, S. 2000. “Efficiency of Commercial Banks in Namibia.” *BON Occasional Paper No. 4*.
- Juzhongzhuang, Herath Gunatilake... oct`2009, *Financial sector development economic growth, and poverty reduction. Asian development bank (adb) economics working paper series no.173*
- King & Levine (1993b), “Finance and Growth: Schumpeter Might be Right”, *Quarterly Journal of Economics*, 108(3), pp.717-37
- Kothari C.R., (2004). *Research methodology: techniques and methods*, 2nded, New Age International Publishers, New Delhi, India.
- Levine, R. (1997). *Financial development and economic growth: Views and agenda*,

Journal of Economic, 35, 688–726.

Lucas, R. (1988). "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22, 2-42.

Marin D (1992). Is the export-led growth hypothesis valid for industrialized countries? *Rev Econ Stat* 74(4):678–688

McKinnon, R.I. (1973), *Money and Capital in Economic Development*, The Brookings Institution, Washington DC.

melkamu dereje,2015 –The Relationship between Commercial Bank ` Development and Growth in Ethiopia

Mugenda M. O. & Mugenda A. (2003). *Research Methods: Qualitative and Quantitative Approaches*, African Centre for Technology Studies, Nairobi, Kenya.

M. Buckle & E. Beccalli, 2011' Principles of banking and finance' FN1024, 2790024

Ngechu. M. (2004), *Understanding the research process and methods*. An introduction to research methods. Acts Press, Nairobi.

Okwo I M., Eze, E C., and Ugwunta, D O., (2012), Does financial sector development cause economic growth? Empirical evidence from Nigeria, *international journal of current research*, vol. 4, issue, 11, ISSN: 0975-833x, pp.343-349.

Pagano, M., 1993, "Financial markets and growth: An overview", *European Economic Review*,37, pp. 613-622.

Robinson, J., 1952, "The generalization of the general theory," in *The Rate of Interest, and Other Essays*. London: Macmillan, pp. 67-142.

Roman T., (2012), *The Link between Financial Development and Economic Growth in Ethiopia*, research paper, Addis Ababa University, Ethiopia.

Saint-Paul G (1992). *Technological Choice, Financial Market and Economic*

*Development. Eur.Econ. Rev.*36(4):763-782.

Samson O., & Abass A. S (2013), Does depositing money in bank impacting economic growth?Evidence from Nigeria, *African Journal of Business Management*, Vol, 7(3), 196-205.

Schumpeter, J. A., (1911). “The theory of economic development”, Harvard University Press,Cambridge, MA.

Schumpeter, J.A., (1912), Theorie derWirtschaftlichen Entwicklung [*The Theory of Economic Development*]. Dunker & Humblot, Leipzig. (Translated by Redvers Opie,Cambridge, MA, Harvard University Press, 1934).

Tom Keating,2014 -The Role of Public and Private sector Banking in Ethiopia`s Future Economic Growth

Zerayehu S E., Kagne W T., and Teshome K A.,(2013), Competition in Ethiopian Banking Industry, *Africal journal of economics*, Vol.1(5), pp. 176-190.

APPENDICES

Annex-1: Table 1: number of the selection bank

S.N. Name of bank	Year of establishment	Ownership
1. Commercial Bank of Ethiopia (CBE)	1963	Public
2. Awash International Bank S.C (AIB)	1994	Private
3. Dashen Bank S.C (DB)	1995	Private
4. Bank of Abyssinia S.C (BoA)	1996	Private
5. Wegagen Bank S.C (WB)	1997	Private

Source: NBE

Anex.2 Table 2 : Banking sector development and Economic growth in Ethiopia (2001-2016)

YEAR	RGDP	% change	ASSSET	% change	DEPO	% change	LOAD	% change	GOEX	% change	EXPO	% change
2001	198,320,900,000.00		24,288,000,000.00		19,686,000,000.00		12,411,000,000.00		15,786,400,000.00		8,146,000,000.00	
2002	201,561,300,000.00	1.63	25,704,000,000.00	5.83	21,355,000,000.00	8.48	11,829,000,000.00	-4.69	17,651,000,000.00	11.81	8,389,000,000.00	2.98
2003	197,331,500,000.00	-2.10	28,950,000,000.00	12.63	23,538,000,000.00	10.22	11,481,000,000.00	-2.94	20,517,000,000.00	16.24	9,779,000,000.00	16.57
2004	220,477,200,000.00	11.73	34,236,000,000.00	18.26	27,610,000,000.00	17.30	12,083,000,000.00	5.24	20,520,000,000.00	0.01	12,913,600,000.00	32.05
2005	248,354,800,000.00	12.64	41,504,000,000.00	21.23	32,293,000,000.00	16.96	14,673,000,000.00	21.44	24,803,000,000.00	20.87	16,076,900,000.00	24.50
2006	277,013,300,000.00	11.54	47,207,000,000.00	13.74	37,543,000,000.00	16.26	16,929,000,000.00	15.38	29,325,000,000.00	18.23	18,205,400,000.00	13.24
2007	309,686,800,000.00	11.79	58,989,500,000.00	24.96	45,110,500,000.00	20.16	19,824,000,000.00	17.10	35,607,000,000.00	21.42	21,854,200,000.00	20.04
2008	344,331,900,000.00	11.19	70,439,764,000.00	19.41	53,064,002,000.00	17.63	28,664,844,000.00	44.60	46,915,000,000.00	31.76	28,317,000,000.00	29.57
2009	378,907,400,000.00	10.04	85,336,581,000.00	21.15	63,721,157,000.00	20.08	32,335,186,000.00	12.80	43,875,200,000.00	-6.48	35,233,000,000.00	24.42
2010	418,946,950,000.00	10.57	106,123,227,000.00	24.36	79,544,346,000.00	24.83	37,298,977,000.00	15.35	71,334,790,000.00	62.59	52,168,000,000.00	48.07
2011	475,647,500,000.00	13.53	154,827,162,000.00	45.89	116,406,856,000.00	46.34	52,372,201,000.00	40.41	93,831,000,000.00	31.54	85,949,800,000.00	64.76
2012	517,026,500,000.00	8.70	205,405,152,672.00	32.67	152,370,106,255.00	30.89	83,593,847,015.00	59.61	124,416,720,000.00	32.60	102,887,000,000.00	19.71
2013	568,432,300,000.00	9.94	252,081,700,718.00	22.72	196,396,632,000.00	28.89	97,517,793,000.00	16.66	153,929,000,000.00	23.72	108,227,100,000.00	5.19
2014	626,977,400,000.00	10.30	305,518,346,000.00	21.20	242,285,731,000.00	23.37	115,541,819,000.00	18.48	185,471,780,000.00	20.49	123,496,000,000.00	14.11
2015	692,221,700,000.00	10.41	380,350,587,789.00	24.49	301,746,215,500.00	24.54	148,376,321,056.00	28.42	230,521,180,000.00	24.29	121,532,200,000.00	(1.59)
2016	747,309,200,000.00	7.96	476,265,218,888.00	25.22	358,166,589,603.00	18.70	182,986,468,393.00	23.33	272,930,090,000.00	18.40	122,366,000,000.00	0.69
	Average	9.33		22.25		21.64		20.75		21.83		20.95

Annex-3: OLS regression estimation at 95% Confidence interval

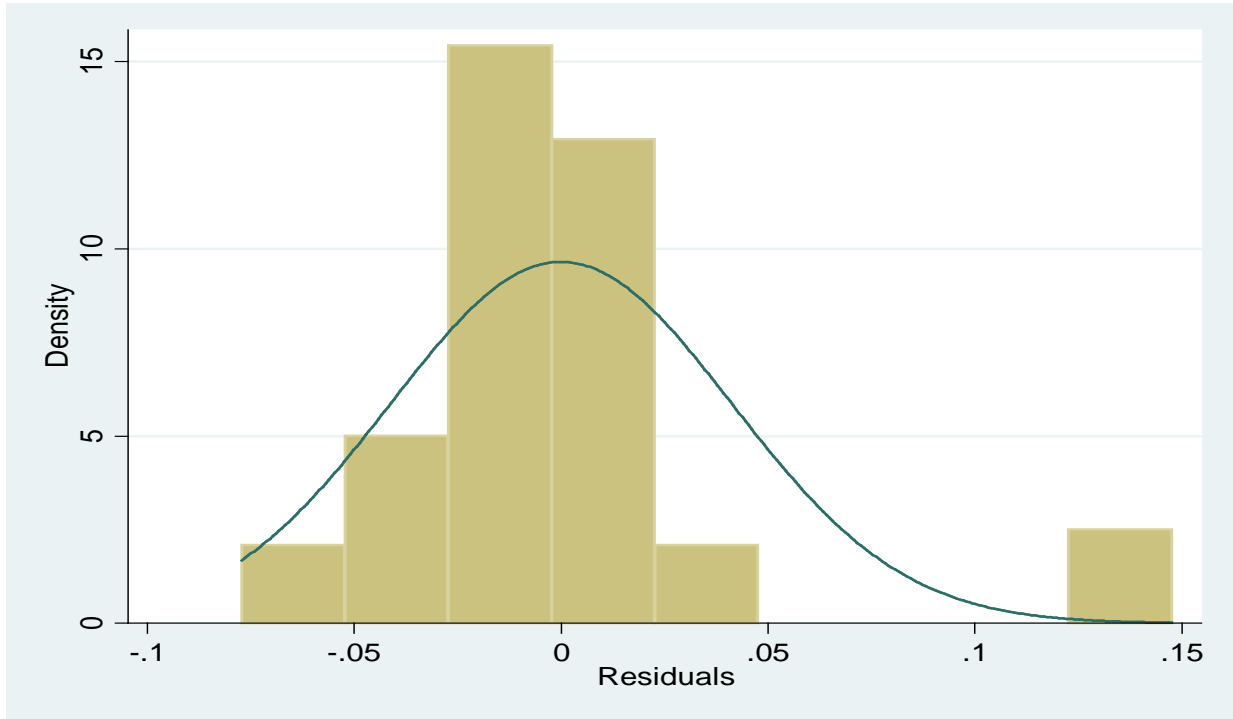
`. regln_RGDPijln_ASSEijln_DEPOijln_LOADijln_EXPOijln_GOEXij`

Source	SS	df	MS	Number of obs = 96		
Model	18.1290366	5	3.62580731	F(5, 90) = 2085.15		
Residual	.156498356	90	.001738871	Prob> F = 0.0000		
Total	18.2855349	95	.192479315	R-squared = 0.9914		
				Adj R-squared = 0.9910		
				Root MSE = .0417		

ln_RGDPij	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ln_ASSEij	-.0015236	.0068375	-0.22	0.824	-.0151075	.0120603
ln_DEPOij	.0120285	.0069813	1.72	0.088	-.0018411	.0258981
ln_LOADij	.0021261	.0069954	0.30	0.762	-.0160237	.0117716
ln_EXPOij	.0354942	.0195348	1.82	0.073	-.0033151	.0743035
ln_GOEXij	.4227666	.0221894	19.05	0.000	.3786834	.4668498
_cons	15.11767	.3198535	47.26	0.000	14.48223	15.75312

Source: STATA 13

Annex-4 Normality test using Histogram and Skewness/kurtosis test



. sktest r(Normality test using Skewness/kurtosis test)

Skewness/Kurtosis tests for Normality					
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
r	96	0.0000	0.0000	36.97	0.0000

```
. sktest r
```

Skewness/Kurtosis tests for Normality					
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
r	96	0.0000	0.0000	36.97	0.0000

Source:STATA 13

Annex-5: Multicollinearity test using VIF

Variable	VIF	1/VIF
ln_GOEXi j	24.23	0.041278
ln_EXPOi j	23.68	0.042236
ln_DEPOi j	1.56	0.639145
ln_ASSEi j	1.54	0.649430
ln_LOADi j	1.42	0.702648
Mean VIF	10.49	

Source:STATA 13

Annex-6 Test for co linearity

`. pwcorr ln_ASSEi j ln_DEPOi j ln_LOADi j ln_EXPOi j ln_GOEXi j`

	ln_ASS~j	ln_DEP~j	ln_LOA~j	ln_EXP~j	ln_GOE~j
ln_ASSEi j	1.0000				
ln_DEPOi j	0.5393	1.0000			
ln_LOADi j	0.2624	0.0467	1.0000		
ln_EXPOi j	-0.2344	-0.2505	-0.4842	1.0000	
ln_GOEXi j	-0.2393	-0.2796	-0.4857	0.9782	1.0000

Source:STATA 13

Annex-7 Test for Multicollinearity after dropping collinear variable

`. vif(Multicollinearity test using VIF)`

Variable	VIF	1/VIF
ln_DEPOi j	1.54	0.649554
ln_ASSEi j	1.53	0.651917
ln_GOEXi j	1.43	0.697060
ln_LOADi j	1.42	0.702943
Mean VIF	1.48	

Source:STATA 13

Anex-8 Test OF Hetroscedasticity

. hettest r (Test for Hetroscedasticity using Breusch-Pagan/Cook-Weisberg test)

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
      Ho: Constant variance
      Variables: r

chi2(1)      =   171.04
Prob>chi2    =    0.0000
```

Anex-9 Test for serial-correlation

. xtserial ln_ASSEij ln_DEPOij ln_LOADij ln_GOEXij

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F( 1,      5) =      8.368
Prob> F =      0.0341
```

H₀: No autocorrelation

H_a: exist first order autocorrelation

```
. xtserial ln_ASSEij ln_DEPOij ln_LOADij ln_GOEXij

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
      F( 1,      5) =      8.368
      Prob > F =      0.0341
```

Source: STATA 13

Anex-10 Unit root tests

. xtunitrootipsln_RGDPij (Unit root tests)

Im-Pesaran-Shin unit-root test for ln_RGDPij					

Ho: All panels contain unit roots		Number of panels =		6	
Ha: Some panels are stationary		Number of periods =		16	
AR parameter: Panel-specific		Asymptotics: T,N -> Infinity			
Panel means: Included		sequentially			
Time trend: Not included					
ADF regressions: No lags included					

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%

t-bar	1.4092		-2.330	-2.090	-1.960
t-tilde-bar	1.3621				
Z-t-tilde-bar	8.8226	1.0000			

☛ Has unit root at level

☛ . xtunitrootipsDln_RGDPij

☛

☛ Im-Pesaran-Shin unit-root test for Dln_RGDPij					
☛ -----					
☛ Ho: All panels contain unit roots		☛ Number of panels =		☛ 6	
☛ Ha: Some panels are stationary		☛ Number of periods =		☛ 15	
☛ AR parameter: Panel-specific		☛ Asymptotics: T,N -> Infinity			
☛ Panel means: Included		☛ sequentially			
☛ Time trend: Not included					
☛ ADF regressions: No lags included					
☛ -----					
☛		☛ Fixed-N exact critical values			
☛	☛ Statistic	☛ p-value	☛ 1%	☛ 5%	☛ 10%
☛ -----					
☛ t-bar	☛ -2.5143		☛ -2.380	☛ -2.110	☛ -1.980
☛ t-tilde-bar	☛ -2.1179				

Z-t-tilde-bar	-2.5056	0.0061
---------------	---------	---------------

At difference

- **xtunitrootpln_ASSEij**

Im-Pesaran-Shin unit-root test for ln_ASSEij					

Ho: All panels contain unit roots			Number of panels =	6	
Ha: Some panels are stationary			Number of periods =	16	
AR parameter: Panel-specific			Asymptotics: T, N ->	Infinity	
Panel	means:			Included	
sequentially					
Time trend: Not included					
ADF regressions: No lags included					

			Fixed-N		exact
critical values			1%	5%	10%
	Statistic	p-value			

t-bar	-1.5923		-2.330	-2.090	-1.960
t-tilde-bar	-1.3777				
Z-t-tilde-bar	-0.0632	0.4748			

At level

. xtunitrootipsDln_ASSEij

Im-Pesaran-Shin unit-root test for Dln_ASSEij

Ho: All panels contain unit roots	Number of panels =	6
Ha: Some panels are stationary	Number of periods =	15
AR parameter: Panel-specific	Asymptotics: T, N -> Infinity	
Panel means: Included	sequentially	
Time trend: Not included		

ADF regressions: No lags included

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%
t-bar	-4.1744		-2.380	-2.110	-1.980
t-tilde-bar	-2.6620				
Z-t-tilde-bar	-4.2787	0.0000			

At difference

• tunitrootipsln_DEPOij

Im-Pesaran-Shin unit-root test for ln_DEPOij

Ho: All panels contain unit roots	Number of panels =	6
Ha: Some panels are stationary	Number of periods =	16
AR parameter: Panel-specific	Asymptotics: T, N -> Infinity	
Panel means: Included	sequentially	
Time trend: Not included		

ADF regressions: No lags included

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%
t-bar	-1.0757		-2.330	-2.090	-1.960
t-tilde-bar	-1.0158				
Z-t-tilde-bar	1.1106	0.8666			

At level

xtunitrootipsDln_DEPOij

Im-Pesaran-Shin unit-root test for Dln_DEPOij

```

-----
Ho: All panels contain unit roots      Number of panels =    6
Ha: Some panels are stationary         Number of periods =   15

AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                sequentially
Time trend:  Not included

ADF regressions: No lags included
-----

```

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%
t-bar	-3.4701		-2.380	-2.110	-1.980
t-tilde-bar	-2.4942				
Z-t-tilde-bar	-3.7318	0.0001			

```

-----

```

At difference

```

.xtunitrootipsln_LOADij
Im-Pesaran-Shin unit-root test for ln_LOADij

```

```

-----
Ho: All panels contain unit roots      Number of panels =    6
Ha: Some panels are stationary         Number of periods =   16

AR parameter: Panel-specific          Asymptotics: T,N -> Infinity
Panel means:  Included                sequentially
Time trend:  Not included

ADF regressions: No lags included
-----

```

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%
t-bar	-2.1462		-2.330	-2.090	-1.960
t-tilde-bar	-1.9024				
Z-t-tilde-bar	-1.7650	0.0388			

```

-----

```

At level

```

xtunitrootipsDln_LOADij

```

```

Im-Pesaran-Shin unit-root test for Dln_LOADij
-----

```

Ho: All panels contain unit roots	Number of panels =	6			
Ha: Some panels are stationary	Number of periods =	15			
AR parameter: Panel-specific	Asymptotics: T, N ->	Infinity			
Panel means: Included		sequentially			
Time trend: Not included					
ADF regressions: No lags included					

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%

t-bar	-5.1100		-2.380	-2.110	-1.980
t-tilde-bar	-2.9574				
Z-t-tilde-bar	-5.2415	0.0000			

At difence

.xtunitrootipln_GOEXij

Im-Pesaran-Shin unit-root test for ln_GOEXij					

Ho: All panels contain unit roots	Number of panels =	6			
Ha: Some panels are stationary	Number of periods =	16			
AR parameter: Panel-specific	Asymptotics: T, N ->	Infinity			
Panel means: Included		sequentially			
Time trend: Not included					
ADF regressions: No lags included					

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%

t-bar	0.8575		-2.330	-2.090	-1.960
t-tilde-bar	0.8657				
Z-t-tilde-bar	7.2127	1.0000			

At level

- xtunitrootipln_GOEXij**

Im-Pesaran-Shin unit-root test for Dln_GOEXij

```

-----
Ho: All panels contain unit roots          Number of panels =      6
Ha: Some panels are stationary             Number of periods =     15

AR parameter: Panel-specific               Asymptotics: T,N -> Infinity
Panel means: Included                      sequentially
Time trend: Not included

ADF regressions: No lags included
-----

```

	Statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%
t-bar	-4.4903		-2.380	-2.110	-1.980
t-tilde-bar	-2.8548				
Z-t-tilde-bar	-4.9069	0.0000			

At difence

Anex-II using VAR and Granger causality test

. pvarln_RGDPijln_ASSEijln_DEPOijln_LOADij, lag(2)

```

Panel vector autoregresssion

GMM Estimation

Final GMM Criterion Q(b) = 2.89e-28
Initial weight matrix: Identity
GMM weight matrix: Robust

No. of obs      =      78
No. of panels   =       6
Ave. no. of T   =     13.000
-----

```

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
ln_RGDPij						
ln_RGDPij						
L1.	1.280771	.1799965	7.12	0.000	.9279842	1.633558
L2.	-.26269	.1838614	-1.43	0.153	-.6230516	.0976716
ln_ASSEij						
L1.	-.0003824	.0078178	-0.05	0.961	-.0157049	.0149401
L2.	.0110064	.0057043	1.93	0.054	-.0001737	.0221866

ln_DEPO _{ij}							
L1.	.0018003	.0091365	0.20	0.844	-.0161069	.0197076	
L2.	-.0038409	.0080683	-0.48	0.634	-.0196545	.0119728	
ln_LOAD _{ij}							
L1.	.0162815	.0093704	-1.74	0.082	-.0346472	.0020843	
L2.	.0087635	.0061408	1.43	0.154	-.0032723	.0207993	

ln_ASSE _{ij}							
ln_RGDP _{ij}							
L1.	-1.837407	2.309741	-0.80	0.426	-6.364417	2.689603	
L2.	2.480218	2.493398	0.99	0.320	-2.406751	7.367187	
ln_ASSE _{ij}							
L1.	.663231	.2039395	3.25	0.001	.2635169	1.062945	
L2.	-.0515525	.1435131	-0.36	0.719	-.3328329	.229728	
ln_DEPO _{ij}							
L1.	.0885079	.1893144	0.47	0.640	-.2825414	.4595573	
L2.	.2785705	.2050655	1.36	0.174	-.1233506	.6804916	
ln_LOAD _{ij}							
L1.	.1797344	.1884412	0.95	0.340	-.1896036	.5490725	
L2.	.4380672	.1961711	2.23	0.026	.0535789	.8225555	

ln_DEPO _{ij}							
ln_RGDP _{ij}							
L1.	-.1596787	1.949331	-0.08	0.935	-3.980298	3.66094	
L2.	.3609206	2.16728	0.17	0.868	-3.886869	4.608711	
ln_ASSE _{ij}							
L1.	.2792515	.1498349	1.86	0.062	-.0144196	.5729225	
L2.	.0536481	.1121255	0.48	0.632	-.1661138	.27341	
ln_DEPO _{ij}							
L1.	.7233992	.1828837	3.96	0.000	.3649537	1.081845	
L2.	.0283761	.1159533	0.24	0.807	-.1988882	.2556404	
ln_LOAD _{ij}							
L1.	.0181735	.1771553	0.10	0.918	-.3290444	.3653915	
L2.	.1983627	.1344191	1.48	0.140	-.0650938	.4618192	

ln_LOAD _{ij}							
ln_RGDP _{ij}							

L1.		2.241231	2.419471	-0.93	0.354	-6.983307	2.500844
L2.		2.145181	2.64338	0.81	0.417	-3.035748	7.32611
ln_ASSEi j							
L1.		.2129064	.1309853	1.63	0.104	-.0438201	.4696328
L2.		-.1746062	.1222723	-1.43	0.153	-.4142555	.0650431
ln_DEPOi j							
L1.		-.157889	.1780012	-0.89	0.375	-.5067649	.190987
L2.		.3181545	.120943	2.63	0.009	.0811106	.5551985
ln_LOADi j							
L1.		.4922946	.191331	2.57	0.010	.1172927	.8672966
L2.		.187275	.1594824	1.17	0.240	-.1253048	.4998547

Instruments : 1(1/2).(ln_RGDPi j ln_ASSEi j ln_DEPOi j ln_LOADi j)							

.Anex-12 test of pvargranger

```

panel VAR-Granger causality Wald test
Ho: Excluded variable does not Granger-cause Equation variable
Ha: Excluded variable Granger-causes Equation variable

+-----+
| Equation \ Excluded | chi2    dfProb> chi2 |
+-----+-----+
| ln_RGDPi j         |         |         |
|   ln_ASSEi j       | 4.582   2     0.101 |
|   ln_DEPOi j       | 0.243   2     0.886 |
|   ln_LOADi j       | 6.720   2     0.035 |
|   ALL              | 14.130  6     0.028 |
+-----+-----+
| ln_ASSEi j         |         |         |
|   ln_RGDPi j       | 1.800   2     0.407 |
|   ln_DEPOi j       | 2.142   2     0.343 |
|   ln_LOADi j       | 5.509   2     0.064 |
|   ALL              | 8.497   6     0.204 |
+-----+-----+
| ln_DEPOi j         |         |         |
|   ln_RGDPi j       | 0.271   2     0.873 |
|   ln_ASSEi j       | 3.772   2     0.152 |
|   ln_LOADi j       | 2.191   2     0.334 |
+-----+-----+

```

	ALL	6.375	6	0.383

ln_LOADij				
	ln_RGDPij	1.242	2	0.537
	ln_ASSEij	3.548	2	0.170
	ln_DEPOij	9.511	2	0.009
	ALL	16.283	6	0.012

Anex-13 Test of Hausman FE RE

---- Coefficients ----				
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FE	RE	Difference	S. E.
ln_ASSEij	-.002286	-.002291	5.02e-06	.0016746
ln_DEPOij	.0136299	.0136343	-4.40e-06	.0016971
ln_LOADij	.0024063	.0023868	-.0000195	.0018301
ln_GOEXij	.461865	.4618723	-7.30e-06	.001341

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)' [(V_b-V_B)^(-1)](b-B)
= 0.00

Prob>chi2 = **1.0000**

xtregln_RGDPijln_ASSEijln_DEPOijln_LOADijln_GOEXij, re savce(robust)

Random-effects GLS regression	Number of obs	=	96
Group variable: BAID	Number of groups	=	6
R-sq: within = 0.0000	Obs per group: min	=	16
between = 0.0000	avg	=	16.0

overall = 0.9911 max = 16
Wald chi2(4) = 59553.69
corr(u_i, X) = 0 (assumed) Prob> chi2 = 0.0000

(Std. Err. adjusted for 6 clusters in BAID)

ln_RGDPij		Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
ln_ASSEij		-.002291	.0117927	-0.19	0.846	-.0254043 .0208222
ln_DEPOij		.0136343	.0121306	1.12	0.261	-.0101412 .0374098
ln_LOADij		.0023868	.0097971	0.24	0.808	-.0215887 .0168151
ln_GOEXij		.4618723	.0048412	95.40	0.000	.4523837 .4713608
_cons		14.97179	.4011922	37.32	0.000	14.18547 15.75811

sigma_u		0				
sigma_e		.04343364				
rho		0 (fraction of variance due to u_i)				