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Private Commercial Banks and Economic Growth in Ethiopia: Panel Data Analysis

A Research Paper Submitted to the School of Graduate Studies of Wolkite University in Partial Fulfillment of the Requirements for Masters of Science Degree in Economics (Major in Developmental Economics)

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As thesis research advisors we hereby certify that we have read and evaluated the thesis prepared, under our direction, by Dereje Diriba, entitled **"**Private Commercial Banks and Economic Growth of Ethiopia: Panel data analysis**"**. We recommend that it be accepted as fulfilling the thesis requirement.

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As members of Board of Examiners of the MSc. thesis open defense examination, we certify that we have read and evaluated the thesis prepared by **Dereje Diriba** and examined the candidate. We recommended that the thesis be accepted as fulfilling the thesis requirement for the Degree of Master of Science in Economics (**Developmental Economics**).

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Declaration

I hereby declare that this thesis entitled “Private Commercial Banks and Economic Growth of Ethiopia: Panel data analysis” has been carried out by me under the guidance and supervision of Dr. Badassa Wolteji and Tesfaye Etensa (Ass.Prof.)

The thesis is original and has not been submitted for the award of any degree or diploma to any university or institutions.

Researcher’s Name	Signature	Date
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Abstract

The purpose this study is to investigate the role of private commercial banks on economic growth in Ethiopia, and their direction of causality for a period of 10 years from 2008-2017. The data was sourced from the National Bank of Ethiopia, Ministry of Finance and Economic Cooperation-MoFEC, Central Statistics Agency (CSA). To undertake this study, eight private commercial banks were purposively selected out of sixteen which currently operating in Ethiopian banking industry. In analyzing the relationship between private commercial banks and economic growth the study applied Unit root tests, Kao Residual co-integration test, and Granger causality test. Moreover, the study used both descriptive statistics and econometric analyses. The Random effect model was used for econometrics analysis. The study found that a positive and significant relationship among profits, loan and advance and labor force with economic growth whereas there is negative and a significant relationship between branch network and economic growth. Furthermore, the study found unidirectional causal relationship moving from loan and advance, and profit to economic growth while there is no causality between asset, deposit and RGDP. There is a bidirectional between branch network and economic growth. Finally, the policy makers and stakeholders should make policies to enhance the banking sector in Ethiopia because profits, loan and advances are significantly contributing in the economic growth of Ethiopia.

Keywords: Private Commercial Banks, Economic Growth, Random Effect, Granger Causality, Ethiopia

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Acronyms and Abbreviations

ADF----------Augmented Dickey Fuller

ARDL----------Autoregressive Distributed Lag

ASSE----------Assets of the bank

BRAN----------Branch network

CAPI----------Capital

CBN----------Central Bank of Nigeria

CF----------Credit Facility

CPS----------Credit to Private Sector

DEPO----------Deposit

EXPO----------Exports

FDI----------Foreign Direct Investment

FOREIG----------Foreign exchange transaction

GDP----------Growth Domestic Product

HDI----------Human Development Index

MFIs----------Micro Finance Institutions

MG----------Mean Group

NBE----------National Bank of Ethiopia

NGDP----------Nominal Gross Domestic Product

OLS----------Ordinary Least Square

OTHBKC----------Other Banks Credit

PBKC----------Total Production Bank Credit

PCB----------Private Commercial Banks

PMG----------Pooled Mean Group

PRF----------Profitability

ROA----------Return on Asset

SME----------Small and Medium Enterprise

TGCBKC----------Total General Commerce Bank Credits

VAR----------Vector Autoregressive

VECM----------Vector Error Correction Model

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

Economic growth is one of the significant destinations of macroeconomic strategy. It is the crucial means of elevating expectations for living comforts and standards, as well as accomplishing economic development. Economic experts define economic growth from numerous perspectives. A number of economists see that it is a rise in the domestic income or the size of production of goods and services by a country over a specific timeframe. In general economic growth is characterized as an expansion in total national output. Consequently, real gross domestic product (RGDP) is considered as proxy of economic growth (Alkhazaleh, 2017).

Pagano (1993) presents three channels by which economic growth might be affected by financial sector, these are: increasing productivity of investments, reducing transaction costs and promoting savings. The main role that meets the financial system in a modern economy is resource allocation, allowing risk sharing between firms and households by pointing the savings from the latter to the corporate sector.

Wahida et al., 2016 stated that Bank is the financial intermediaries that collects fund from surplus unit and provide the same to the deficit unit. In each year the private commercial banks provide fund to SME entrepreneurs from their total deposit.

Leitao (2012) analyzes the relation between economic growth and bank credit. Introducing variables as domestic credit, savings, bilateral trade and inflation, it is shown that endogenous models have a greater potential to explain economic growth. It is confirmed that savings encourage growth and the inflation and domestic credit are negatively correlated with economic growth.

Banking is a standout amongst the most basic organizations everywhere throughout the world as banks assume principal part in the economy of a nation, where they provide financial assistance to both government and private sectors, however at the same time this sector also confronts

incapacity because of non-performing credits and failed in recovery of given advances. In finance standings performance of the bank means profit and soundness in economic exercises. On the off chance that profitability of the bank and deposits are increasing continuously it implies that bank performance is growing. The solvency of the bank means capability to encounter its liabilities, if the bank is in the solid solvency situation it states the bank performance is good. There is no suspicion that the provision of money to investors in the financial markets, attempting to prepare these markets both in terms of size and prices, as it adds to an effective contribution to the creation of new economic projects and extension of existing projects, which implies support the economy for the better represented by increasing the standard of living, and expanded per capita income and corporate income and returns for the state through taxes and dues, as well of decreasing the unemployment rates through employing new workers in the new activities (Alkhazaleh, 2017).

Looking at least developed countries, a growing body of evidence suggests that financial institutions such as banks, insurance companies and financial markets like stock, bond and derivative market exert a powerful influence on economic development, poverty alleviation and economic stability (Levine et.al. 2012). It is necessary to assess the role of commercial banks in developing countries, which are traditionally intermediaries between households saving and investment firms. Moreover, the importance of bank is more pronounced in developing countries because financial markets are usually underdeveloped and banks are typically the only major source of finance for the majority of firms (Arun and Turner (2004) as cited in Athanasoglou et al., 2006).

Credit has been discovered to be a major constraint on the intensification of both large and small scale farming (Von-Prisckieke, 1986; Ogunfowora et al, 1972; Buchenau, 2003 & World Bank, 2004). However, Abubakar and Gani (2013), using a co-integration Vector Error Correction Model (VECM), examined how credit affects economic growth in the long run in the Nigerian economy. The study revealed that excessive Government borrowing, coupled with high interest rates caused a crowding out effect on private sector investment and negatively impacted economic growth.

In Nigeria, Abe (1982) reported that non-institutional creditors' accounts for 70% of the total credits received. However, with the present situation these sources could hardly meet the increasing demand for credit by farmers. Likewise Ibrahim et al. (2007) found that in Ethiopia informal sector was the main source of credit in rural areas. Therefore, banks are the dominant formal financial institutions currently operating in Ethiopia (Lakew, 2000; Getahun, 2008). According to Lakew, on average, banks cover 96 percent of gross of financial assets and non-banks account only for 4 percent. Therefore, foregoing fact that, this study would like to investigate the role of private commercial banks on economic growth in Ethiopia, and their direction of causality.

1.2. Statement of the Problem

It is perfectly clear that countries that have great monetary and financial system tend to build up its economic development all more rapidly. The critical role of financial institutions towards the growth and development of the economy cannot be over emphasized. For a sustainable growth in any given economy, financial resources must be effectively and efficiently mobilized and allocated in such a way to harness the synergies between human, material and managerial resources for optimal economic output (Owusu, 2016). The mobilization of funds for productive economic activities is heightening by operation of financial institutions and stability and reliability of the financial system in general.

The correlation between financial sector and economic growth has been a theme in numerous studies, both theoretical and empirical. There are papers showing the pro and con arguments about the impact of financial system on a country's economic growth. Within the theoretical literature, it generally accepted that intensification of financial instruments and institutions would tremendously reduce transaction and information costs in an economy which in turn influences savings rate, investment decision and technological innovative ventures (Nwakoby & Ananwude, 2016).

Some economists, such as John Hicks (1969) argue that the financial system played an important role in the ease of capital mobility in England. In 1912, Joseph Schumpeter argued that identifying and funding the entrepreneurs with the best chances of implementation of innovative

products would encourage banks to technologically innovate. At the other pole, Joan Robinson claims that the financial system automatically responds to requests from various financial arrangements created by economic development. In addition, Robert Lucas (1988) and Nicholas Stern (1989) do not support that the financial system-economic growth relationship is significant.

The principal role carried out by commercial banks is to ensure there is adequate flow of money to serve the deficit sectors of the economy and facilitate the movement of funds among economic units (Ogege & Boloupremo, 2014). This increases the financial intermediation process in the country which according to Nwakoby and Ananwude (2016), is very critical as most of the financing that takes place in the economy is consequent to intermediary functions of both commercial banks and non-bank financial institutions. The empirical literature shows that countries which benefit from a better financial system were part of a faster economic growth process, and it can be referred to the characteristics of the financial system.

Koivu (2002) specifies that increase in credit has not always been sustainable and it may have led to a decline in growth rates. Analyzing the link between economic growth and the amount of credit to the private sector in 25 developed countries, over a period of almost 7 years, from 1993 to 2000, Koivu (2002) notes some characteristics of economies: decreases of gross domestic product have been caused by large amount of credit.

Yakubu and Affoi (2014) recognized banks' conventional roles to incorporate financing of agriculture, manufacturing and syndicating of credit to gainful segments of the economy, in which profit is also realized by the banks within the economy.

In former studies many scholars establish negative impact (Fadare, 2010) on economy growth owing to restructuring in determining factor of financial performance and some discovered no or bad response compared to different sorts of financial sectors comprising banking sectors. For instance, Joan Robinson claims that the financial system automatically responds to requests from various financial arrangements created by economic development. In addition, Robert Lucas (1988) and Nicholas Stern (1989) do not support that the financial system-economic growth relationship is significant.

Habtamu Negussie (2012), investigated determinants of private commercial banks profitability in Ethiopia by using panel data of seven private commercial banks from year 2002 to 2011. The study used quantitative research approach and secondary financial data are analyzed by using multiple linear regressions models. The empirical results shows that bank specific factors; capital adequacy, managerial efficiency, bank size and macro-economic factors; level of GDP, and regulation have a strong influence on the profitability of private commercial banks in Ethiopia.

It is clear from the literature review, regarding the relationship between commercial banks development and economic growth, that studies produce mixed results. Most of the studies have found existence of long-run relationship between commercial banks development and economic growth. The empirical results on the direction of causality are more mixed as compared to co-integration analysis. Some findings indicate that there is unidirectional causality running from commercial banks development to economic growth, hence supporting supply leading hypothesis. Another variation in the results of causality is the finding of unidirectional causality running from economic growth to financial development; this supports the demand following hypothesis. And also some studies argue financial development and economic growth have bidirectional causality and few studies have no causality between the two. More from the above studies we can conclude that there is no clear role of private commercial banks on economic growth of developed countries in general and developing countries in particular. When we look at Ethiopia, there is no study that addressed the role of private commercial banks and its direction of causality yet.

Therefore, this study attempts to contribute to the existing body of literature on the relationship between private bank's role and economic growth in Ethiopia by addressing shortcomings of previous works. Besides, the previous studies ignore the potential variables such as labor force and Branch network. Methodologically, this study used panel model to analysis unlike what Habtamu's done. This study aimed to fill the gap that role of private commercial banks in Ethiopian Economy and their direction of causality.

1.3. Research Question

This study was answered the question:

- ✓ What is the role of private commercial banks on Ethiopia's economic growth?
- ✓ What is the direction of causality between private commercial banks indicators and economic growth in Ethiopia?

1.4. Objectives of the Study

The main objective of this study is to investigate the role of private commercial banks on economic growth in Ethiopia, and their direction of causality.

The specification objectives are:

- To examine the role of private commercial banks on the Ethiopian economy growth.
- To identify the direction of causality between private commercial banks indicators and economic growth in Ethiopia

1.5. Significance of the Study

This research will contribute to the scholarly discussion concerning whether private commercial banks are driver of economic growth. Future researchers and other scholars will use the findings of this study in advancement of the discussion.

To the managers of the private commercial banks in Ethiopia the research will provide evidence that will shed light on whether injection of credit into the Ethiopian economy, brings about economic growth. In case private commercial bank loans will be found to have a great bearing on economic growth, this will then be a channel they can use not only to make profit for their institutions, but also a channel of driving economic growth.

For government policy makers this research will establish whether the private commercial banks drive economic growth. If not, it will stimulate curiosity of finding out how private banks in Ethiopia play a crucial role by financing different sectors or how the loans contribute to growth and come out with a policy tailored specifically for the Ethiopian environment.

1.6. Scope and Limitations of the Study

The study was bounded by only investigating the role of private commercial banks on economic growth of Ethiopia and the direction of causality with a time frame of 10 years, from 2008 to 2017 and among 16 private commercial banks in Ethiopia 8 banks were selected to conduct the research.

The study focused on eight leading Private Commercial Banks in the county of Ethiopia and having more than ten years experience in the market. Namely, Awash Bank (AB), Bank of Abyssinia (BOA), Dashen Dank (DB), Wegagen Bank (WB), United Bank(UB), Nib International Bank (NIB), Cooperative Bank of Oromia (CBO) and Lion International Bank (LIB). Lack of organized data regarding Private Commercial Banks and Economic growth in Ethiopia another limitation of the study that imposed lots of work on the researcher in organizing different sorts of data to get consistent information.

1.7. Hypothesis of the Study

In line with the broad purpose statement the following hypotheses were also formulated for investigation purpose. Hypotheses of the study stands on the theories related to a role of commercial banks on economic growth that has been developed over the years by banking area researchers and past empirical studies. Hence, based on the general objective, the present study seeks to test the following hypotheses:

H0: Deposit has no significant impact on economic growth

H1: Deposit has significant impact on economic growth

H0: Loan & Advance has no significant impact on economic growth

H2: Loan & Advance has significant impact on economic growth

H0: Asset has no significant impact on economic growth

H3: Asset has significant impact on economic growth

H0: Profit has no significant impact on economic growth

H4: Profit has significant impact on economic growth

1.8. Organization of the Paper

This paper consists of five chapters with different sections and sub-sections and it was structure as follows. Chapter one presents the introduction for the main part of the paper. Chapter two reviews the most significant theoretical and empirical studies. Chapter three focuses to presents methodology of the study. Chapter four also provide the results and discussion. Chapter five as usual gives conclusion and recommendation with policy implication and further research direction.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Theoretical background

2.1.1. Economic growth

The model of economic growth is regarded as an increase in the net national production in a given period of time (Dewett, 2005). This study elucidated that economic growth is in general referred to as a quantitative alteration in economic variables, normally persevering over successive periods. Todaro and Smith (2006) distinct economic growth as a sound process by which the productive volume of the economy is augmented over time to bring about rising levels of national production and income. Jhingan (2006) considers economic growth as rise in output and clarifies further that it is associated to a quantitative sustained rise in the country's per capita income or production escorted by increase in its labor force, consumption, capital and size of trade. The key features of economic growth are great rate of growth of per capita income or, high rate of yield, high rate of structural transformation, international flows of resources such as labor, goods and capital (Ochejele, 2007).

Economic growth can also be expressed in terms of gross domestic product (GDP) and Index of Human Development (HDI), which is an index that gauges national growth based on measures of life expectation at birth, education accomplishment, literacy and adjusted real per capita income. Following the above definition we can draw that economic growth is went there is a sustained increase in the real production of goods and services per head. The gross domestic product is one of the most significant economic signs used by economic decision creators and government in preparation and formulates the policies. Gross domestic product (GDP) is the most imperative economic indicator that reflects overall health of the economy. If by growth you intend the increase of output of goods and services, then real GDP which measures growth without the effects of inflation is hardly acceptable (Lequiller, 2001). It has been put up for this purpose. Gross Domestic Product is clear as the totality of all goods and services created in a country over time, without double counting yields used in other output. It is a broad measure, casing the production of consumer goods and services, even government facilities.

2.1.2. Cobb-Douglas Theory of Economic Growth

This theory was put forth by Charles W. Cobb and Paul H. Douglas in 1928 to explain the relationship between production (and therefore economic growth), labour and capital. Based on data on population, capital and production for the period 1899 to 1922, Cobb-Douglass (1928) established that output was a function of labour supply and capital connected within a given level. The capital component provided the way through which lending enters the equation. A significant portion of credit borrowed from banks or elsewhere is used for capital accumulation. The accumulated capital becomes one of the variables of economic growth in the Cobb-Douglas theory (Ghani & Suri, 1999).

This theory is relevant to this research for it provides a mathematical connection between production, labour and capital though it was operational within a context of constant technology. Loans given by the banks are used as capital for the production process whose change indicates growth. This theory therefore provides the connection between capital and growth (Tan, 2008).

$$Y(t) = K(t)^{\alpha} \; (A(t)\, L(t))^{1-\alpha} \quad \ldots\ldots 2.1.2)$$

where *Y* is gross domestic product, *K* is the stock of capital (which may include human capital as well as physical capital), *L* is labor, and *A*(*t*) represents the productivity of labor, which grows over time at an exogenous rate. Because of constant returns to scale, if all inputs are increased by the same amount, say 10%, then output will increase by the same amount (10% in this case). More generally,

$$\mu Y = F(\mu K, \mu L) \quad \ldots\ldots (2.1.3)$$

where μ is some positive amount (1.1 in the case of a 10% increase). Because μ can be any positive real number, a mathematical trick useful in analyzing the implications of the model is to set $\mu = 1/L$ so that

$$\mu/L = f\,(K/L, 1) \text{ or } y = f\,(k) \quad \ldots\ldots (2.1.4)$$

2.1.3. Robert Solow Model of Growth

This theory was suggested by Robert Solow in 1956. This is a model of long-run economic growth within the neoclassical economics framework. The model attempts to explain long-run economic growth means of capital accumulation, labor (population) growth, and the increases in

productivity otherwise called technological progress. The Solow model has the following assumptions. First it assumes that capital is subject to diminishing returns in a closed economy. Secondly, holding the stock of labour constant, the impact of the last unit of capital accumulated on output will always be less than the one before. Thirdly, given no technological progress or growth of the labor force, at some point the amount of new capital produced is only just enough to make up for the amount of existing capital lost due to depreciation. At this point there is no more economic growth (Romer, 2011).

The Solow model added the component of changing technological context in order to reduce the effect of diminishing returns in the Cobb-Douglas model. The Solow model therefore suggested that production is a function of state of technology, supply of labour, and capital. The production function made technological progress equivalent to an increase in the effective (supply of labor given the state of technology) which grows not at the rate of population growth only, but at the rate equal to the sum of growth rate of population and productivity (Solow, 1956).

This theory is relevant to this study in the following sense. First, the model approaches the level of economic growth from the output perspective. Secondly, commercial loans are assumed to provide capital which is used to improve the production in a country. The theory simply provides the connection between the capital, the other factors of production and level of national output given the level of technology (Romer, 2011).

The Solow equation (Equation 2.1.5) gives the growth of the capital-labor ratio, *k* (known as capital deepening), and shows that the growth of *k* depends on savings *sf*(*k*), after allowing for the amount of capital required to service depreciation, $^{\delta}k$, and after capital widening, that is, providing the existing amount of capital per worker to net new workers joining the labor force, nk. That is,

$$\Delta k = sf(k) - (\delta + n)k \quad \text{.....(2.1.5)}$$

2.1.4. Endogenous Growth Theory

According to Ray et al (1997), this theory was postulated by Joseph Schumpeter, reason why it was called the Neo-Schumpeterian model. The neoclassical model of Solow did not explain the

rate of technical progress. Solow took the rate of technical progress to be something that "just happens". In contrast to Solow, Schumpeter believed that insatiable human wants more and better products therefore research and development are carried out to make a profit on new and better products hence resulting to economic growth. Unlike neoclassical growth theory, in the endogenous growth theory, a higher saving rate can cause greater long run growth through stimulating more invention. If for example companies more in high powered computers, new discoveries will become relatively cheaper and the rate of technological progress will increase.

Schumpeterian view was supported by an economic historian, Jacob Schookler, who found out that profit was the prime motive in the historical record of important inventions in petroleum refining, railway and farming.

2.1.4.1. Motivation for Endogenous Growth Theory

The mixed performance of neoclassical theories in illuminating the sources of long-term economic growth has led to dissatisfaction with traditional growth theory. In fact, according to traditional theory, there is no intrinsic characteristic of economies that causes them to grow over extended periods of time. The literature is instead concerned with the dynamic process through which capital-labor ratios approach long-run equilibrium levels. In the absence of external "shocks" or technological change, which is not explained in the neoclassical model, all economies will converge to zero growth. Hence rising per capita GNI is considered a temporary phenomenon resulting from a change in technology or a short-term equilibrating process in which an economy approaches its long-run equilibrium. (Todaro and Smith 2012)

Any increases in GNI that cannot be attributed to short-term adjustments in stocks of either labor or capital are ascribed to a third category, commonly referred to as the Solow residual. This residual is responsible for roughly 50% of historical growth in the industrialized nations. In a rather ad hoc manner, neoclassical theory credits the bulk of economic growth to an exogenous or completely independent process of technological progress. Though intuitively plausible, this approach has at least two insurmountable drawbacks. First, using the neoclassical framework, it is impossible to analyze the determinants of technological advance because it is completely independent of the decisions of economic agents. And second, the theory fails to explain large differences in residuals across countries with similar technologies. (Todaro and Smith 2012)

According to neoclassical theory, the low capital-labor ratios of developing countries promise exceptionally high rates of return on investment. The free market reforms impressed on highly indebted countries by the World Bank and the International Monetary Fund should therefore have prompted higher investment, rising productivity, and improved standards of living. Yet even after the prescribed liberalization of trade and domestic markets, many developing countries experienced little or no growth and failed to attract new foreign investment or to halt the flight of domestic capital. The frequently anomalous behavior of developing-world capital flows (from poor to rich nations) helped provide the impetus for the development of the concept of endogenous growth theory or, more simply, the new growth theory.

The new growth theory provides a theoretical framework for analyzing endogenous growth, persistent GNI growth that is determined by the system governing the production process rather than by forces outside that system. In contrast to traditional neoclassical theory, these models hold GNI growth to be a natural consequence of long-run equilibrium. The principal motivations of the new growth theory are to explain both growth rate differentials across countries and a greater proportion of the growth observed. More succinctly, endogenous growth theorists seek to explain the factors that determine the size of l, the rate of growth of GDP that is left unexplained and exogenously determined in the Solow neoclassical growth equation (i.e., the Solow residual). (Todaro and Smith 2012)

2.1.5. Role of Banks in the Development of the Country

Banks are one of the most important parts of any country. In this modern time money and its necessity is very important. A developed financial system of the country ensures to attain development. A modern bank provides valuable services to a country. To attain development there should be a good developed financial system to support not only the economic but also the society. So, a modern bank plays a vital role in the socio economic matters of the country. Some of the important role of banks in the development of a country is briefly showing below.

2.1.5.1. Promote Saving Habits of the People

Bank attracts depositors by introducing attractive deposit schemes and providing rewards or return in the form of interest. Banks providing different kinds of deposit schemes to its customers. It enables to create banking habits or saving habits among people.

2.1.5.2. Capital Formation and Promote Industry

Capital is one of the most important parts of any business or industry. It is the life blood of business. Banks are increase capital formation by collecting deposits from depositors and convert these deposits in to loans advances to industries.

2.1.5.3. Smoothing of Trade and Commerce Functions

In this modern era trade and commerce plays vital role between any countries. So, the money transaction should be user friendly. A modern bank helps its customers to sent funds to anywhere and receive funds from anywhere of the world. A well developed banking system provides various attractive services like mobile banking, internet banking, debit cards, credit cards etc. these kinds of services fast and smooth the transactions. So, bank helps to develop trade and commerce.

2.1.5.4. Generate Employment Opportunity

Since a bank promote industry and investment, there automatically generate employment opportunity. So, a bank enables an economy to generate employment opportunity.

2.1.5.5. Support Agricultural Development

Agricultural sector is one of the integral part of any economy. Food self sufficiency is the major challenge and goal of any country. Modern bank promote agricultural sector by providing loans and advances with low rate of interest compared to other loans and advances schemes.

2.1.5.6. Applying of Monitory Policy

Monitory policy is an important policy of any government. The major aim of monitory policy is to stabilize financial system of the country from the dangerous of inflation, deflation, crisis etc.

2.1.5.7. Balanced Development

Modern banks spreading its operations throughout the world. We can see number of big banks like Citi bank, Baroda bank, Commerz bank etc. It helps a country to spread banking activities in rural and semi urban areas. With the spreading of banking operations around the country, helps to attain balanced development by promoting rural areas. Modern bank plays vital role in the socio- economic development of the country. A developed banking system enables the country to attain balanced development without any special consideration of rich and poor, cities and rural areas etc.

2.1.6. Role of Commercial Banks in Economic Development

Commercial banks are one source of financing for small businesses. The role of commercial banks in economic development rests chiefly on their role as financial intermediaries. In this capacity, commercial banks help drive the flow of investment capital throughout the marketplace. The chief mechanism of this capital allocation in the economy is through the lending process which helps commercial banks.

2.1.6.1. Risk Minimize

One of the most significant roles of commercial banks in economic development is as arbiters of risk. This occurs primarily when banks make loans to businesses or individuals. For instance, when individuals apply to borrow money from a bank, the bank examines the borrower's finances, including income, credit score and debt level, among other factors. The outcome of this analysis helps the bank gauge the likelihood of borrower default. By weeding out risky borrowers, commercial banks lessen the risk of financial losses.

2.1.6.2. Funds to Small Business

Commercial banks also finance business lending in a variety of ways. A business owner may request a loan to finance the start-up costs of a small business. Once funded, the small business may begin operations and embark on a growth plan. The aggregate effect of small business activity generates a significant portion of employment around the country.

2.1.6.3. Wealth

Commercial banks also offer types of accounts to hold or generate individual wealth. In turn, the deposits commercial banks attract with account services are used for lending and investment. For example, commercial banks commonly attract deposits by offering a traditional menu of savings and checking accounts for businesses and individuals. Similarly, banks offer other types of timed deposit accounts, such as money market accounts and certificates of deposit.

2.1.6.4. Government Spending

Commercial banks also support the role of the federal government as an agent of economic Development. Generally, commercial banks help fund government spending by purchasing bonds issued by The Department of the Treasury. Both long and short term Treasury bonds help finance government Operations, programs and support deficit spending.

2.2. Empirical Literature Review

Most scholars have agreed that there is relationship between bank lending and economic growth. However, researchers have differed on the way of causality between bank lending and economic growth (Oluitan, 2009). Similarly, Oluitan (2009) is of the view that policy makers should concentrate less on measures leading to rise in bank lending and concentrate more on legal, regulatory and policy reforms that boost the functioning of markets and banks. Moreover, Neba Cynthia (2008), conducted a study on evaluating the role of micro finance institutions (MFIs) in the growth of Cameroon's economy. One of the key reasons of this study was to help government and other agents involved in the growth of the economy to develop a good developmental strategy and policies. The work also intended to help micro financial institutions

to improve on their services or to implement advanced measures, so as to enhance economic growth in the economy. She made use of time-series experiment design in the collected data on two variables, loans provided by micro finance institutions and GDP percapital from 1996 to 2007. Loans provided by MFI were taken to be the independent variable while GDP was the dependent variable. Using both descriptive method of data analysis median, standard deviation and inferential tools of data analysis such as the F-test, R2, t-test and Durbin-Watson statistics to test her null hypothesis, which was 'there is no relationship between loans given to the economy by MFIs and the GDP per capital' she concluded that credit granted by MFIs has a significant effect on the growth of the GDP per capita, hence she rejected her null hypothesis.

Ahmad and Malik (2009) inspected role of the financial development on the growth of economy covering thirty five developing nations done using GMM approach, and concluded if the local bank credit to the private segment amplified this will lead growing per workers productivity and subsequently in the long increasing the growth. Adamopoulos (2010) studied the connection between financial development represented by the stock market index and the local banking credits to private sector, and economic growth for the period 1965–2007 for Ireland utilizing a vector error correction model, Johansen Cointegration test.

By using Granger causality tests the study specified that economic growth effects credit market development, while there is a joint causal association between development of stock market and economic growth. Consequently, it can be concluded that economic growth has a direct effect on stock market and credit market development considering the positive influence of growth of industrial production on economic growth. Fidelis, Ogwumike and Salisu (2010) observed the relationship between bank deposit liability, credit to private sector, real discount rate and stock market capitalization (elements of financial development) and economic growth of Nigeria expressed by real gross domestic product for the period 1975 to 2008 and the study used the Bound test Autoregressive Distributed Lag (ARDL) approach. The outcomes demonstrated that there is a unique long run association between financial progress and economic growth. Furthermore, Egbetunde and Mobolaji (2010) looked at the causality and the long-run connection between financial development represented by private credit, bank credit, liquid liabilities and broad money and per capita real GDP as a measure of economic growth for ten Sub-Saharan African economies for the period 1970–2005. They used different tools, such as

unit root test, Cointegration test, Granger causality test and Vector Error Correction Model (VECM) to inspect the hypotheses. The VECM and Cointegration consequences displayed that financial development and economic growth have a long-run association. Granger causality test illustrated that financial development Granger reasons economic growth for Burundi, Cameroon, Mali and Nigeria. While the economic growth reasons financial development for Benin, Burkina Faso, Madagascar and Malawi. Besides, there was bidirectional causality between financial development and economic growth for Cote d'Ivoire and Ghana. Bangake and Eggoh (2011) surveyed the causality between financial development and economic growth for seventy one developing economies over the period 1960–2004. The empirical analysis used both the Panel Cointegration tests and the Panel Cointegration assessment (Dynamic OLS and panel VECM approach). The work showed that together financial development and economic growth have impact on one another, on the other hand proposes that a long run policy approach possibly will evidence valuable among the developing economies. Moreover, by Utilizing sample represented by countries from Middle East and North Africa over the period 1980–2007, Kar, Nazliogu, and Agir (2011) explored the causal association between the ratio of narrow money to income, broad money to income, quasi money to income, deposit money bank liabilities to income, domestic credit to income, and ratio of private sector credit to income. Additionally, the growth represented by real income. The simple linear model was employed in this study. The Granger Causality test was engaged to found the causal association between financial development and economic growth. The work concluded bidirectional causality. The study proposes that a significant relation may be present between financial development and the real sector.

Akpansung and Babalola (2012) inspected the association between credit in banking sector and economic growth in Nigeria for the period from 1970 to 2008 utilizing the least squares approach (two-stage). The study establishes evidence that credit in private sector positively affected on economic growth while lending rate slows down economic growth. In addition, in Nigeria and for the period 1970-2010 Shittu (2012) deliberated the association between the ratio of broad money supply (M2) to nominal gross domestic product (NGDP) as a measure of financial intermediation and the ratio of domestic credit to the private sector (CPS) to the nominal gross domestic product (NGDP). As well as economic growth measured by the growth rate of the real gross domestic product. The study utilized unit root test Johansen- Cointegration test and error

correction model to observe the hypotheses. The study discovered that financial intermediation has direct effect on economic growth.

Ben Salem and Trabelsi (2012) experienced the association for the same issue in seven economies from Southern Mediterranean region during the period from 1970 to 2006. The study put on the Pedroni panel cointegration analysis for seven factors represented financial developments. The outcome of this study approved the presence of association with a long-run base between the financial improvement and the rate of growth. Reliant upon the consequences of earlier literatures review, the contribution or the importance of study came from many facts. Firstly it investigated the association between banking credit at the sectoral country-level which enclosed four sectors (agriculture, industry, construction, and tourism). What is more the study engaged more advanced econometric methods for example Vector autoregressive approach (VAR) model, and Granger Causality test. Onuorah and Ozurumba (2013) disaggregated total bank credit to components such as Total Production Bank Credits (TPTBKC), Total General Commerce Bank Credits (TGCBKC), Total Services Bank Credit (TSCBKC), and Other Banks Credit (OTHBKC) and also established that none of the components granger caused RGDP, while RGDP applied noteworthy influence on the different components. In contrast, Oluitan (2012) detected that credit granger caused output.

For India, Ray (2013) studied the causal dynamic associations between the degree of financial development gauged by gross domestic capital formation to GDP, gross domestic savings to GDP and the ratio of outstanding debt to GDP. Labor force growth proxy by Population growth and annual growing of exports as a measure of the level of trade openness and the economic growth measured by annual growing of GDP for the period from 1990 to 2010. The study used Granger causality to examine the causality between variables; it found that financial growth measures granger affected economic growth as there was a unidirectional causality running from gross domestic capital formation and gross domestic savings to economic growth. The study did not find a causality running from exports progress and population growth to economic growth.

Recently and for instance, Emecheta and Ibe (2014) employed the reduced Vector Autoregresion approach utilizing data from Nigeria for the time period 1960-2011 to examine the association between banking credit and economic growth. Among some methodological inadequacies, such

as his failure to harmonise the different base periods for the real Gross Domestic Product data used and the fact that he ignored the possibility of structural breaks effects in his modelling approach, the study established a significant direct between banking credit and economic growth. Studies with similar findings, but susceptible to the methodological flaws observed in Emecheta and Ibe (2014) include Akpansung and Babalola (2012) using annual data for the time span 1970-2008, Oluitan (2012) using data for the time period 1970-2005, Onuorah and Ozurumba(2013) utilizing data for 1980-2011, and Yakubu and Affoi (2014) used annual data for 1992-2012 In the same context, Balago (2014) empirically . inspected the relationship between Development in Financial Sector measured by bank credits, total market capitalization and foreign direct investment and economic growth. To examine the hypotheses the study utilized data for the period 1990–2009 and used various econometric techniques for example Augmented Dickey Fuller (ADF) test, Johansen Multivariate Co-integration Test, Ordinary Least Square Regression and Vector Error Correction Model (VEC). The study discovered that the financial development has a significant and positive impact on economic growth.

Olowofeso, E. O., Adeleke, A. O., & Udoji, A. O. in their study (2015) deliberated the impact of credit in private sector on economic growth in Nigeria. The study examined the impacts using the Gregory and Hansen (1996) co-integration test that accounted for structural breaks and endogeneity problems. The technique was applied to quarterly data across 2000:Q1 to 2014:Q4, while the fully modified ordinary least squares procedure was engaged to estimate the model coefficients. The results found a co-integrating association between output and its selected determinants, albeit, with a structural break in 2012:Q1. Amongst others, discoveries from the error correction model established a positive and significant effect of credit on output, while increased prime lending rate was impeding growth. In view of the financial intermediation roles of deposit- money banks, the research backings the ongoing efforts of the Central Bank of Nigeria in endorsing a rigorous and real sector-friendly financial system. Similarly, the commitment of the CBN to the gradual lessening in interest rates is significant for the country's growth goals.

Utilizing annual data for the time span 2006-2012, Korkmaz, S. (2015) explored the influence of banking credits on economic growth and inflation. The study illustrated economic functioning would be realized non-problematically to a degree that countries could reach financial

deepening. Financial deepening would deliver a crucial role for particularly moving funds that were generated by banks to real sector. Whether local credits created by banks had any impact on macroeconomic variables such as economic growth and inflation for ten selected European economies via panel data analysis was verified. As a consequence of panel data analysis, it was evidenced that local credits generated by banking sector for ten European countries did not impact inflation but did influence economic growth.

In context of Kosovo, Mazelliu, M., & Zogjani, J. (2015) examined the impact of financial segment on economic growth. The study points out that financial sector was world-wide reflected by the core component of the economic growth (Greenwood, 2013). This study intended to present the effect of financial sector on economic growth during the period span from 2008 until 2014. The focal theoretical arguments for discussion and analysis concentrated on the difficulties and challenges of financial segment in Kosovo under former Yugoslavia, the main process of establishment of financial sector in Kosovo in post war period, overall structure of financial sector in Kosovo, the effect of financial global crisis on financial sector particularly on foreign capital / investors in banking system and other factors that have impacted lessening of the annual rate of financial sector in 2010 and 2011. This research used secondary data, which are computing through STATA program and as the main analyses in the paper are descriptive statistic, OLS method and correlation matrix. The outcomes of analyses have revealed that financial sector has direct impact and positive correlation with economic growth, inflation rate has positive effect and positive significance on economic growth and exchange rate has adverse impact and insignificance in economic growth. As a result the research closes that financial sector should play a critical role in Kosovo's economy because its contribution in GDP is too great, where together with FDI and remittance they contribute about 60% of Kosovo's GDP. Irrespective of decline of financial sector in last few years (as result of reflection of global crisis in Kosovo), it is very essential for the financial sector to continue to rise further its contribution in overall economy of Kosovo.

Kenza, M., & Eddine, G. N. S. (2016) experienced the effect of the development of financial sector on growth for the case of the MENA economies. This research is designed to observe the impact of financial development on economic growth in the context of the MENA region. The

study adopted a number of measures of financial development such as private credit to GDP, M2/GDP, the ratio of commercial bank assets to the total of commercial bank assets and central bank assets. It also has considered growth rate of real GDP as dependent variable and few core control variables of economic growth. This study engaged also panel time series data during the time span of 1980–2012 for each indicator for a split sample of eleven MENA countries. With the aim of measuring the impact, this study analyzed the data by applying panel autoregressive distributed lag (ARDL) framework of pooled mean group (PMG), mean group (MG) and Dynamic fixed effect (DFE) estimators. The end result obtained from PMG estimators revealed that the financial intermediary has an adverse effect on the growth rate in the MENA countries in the short and long run. The paper concluded by pointing out directions to improve financial development in the MENA economies by applying more financial reforms to endorse competition in the financial sector and financial structure expansion that mirrors in the progress of the quality and quantity of financial services.

Further, in analyzing the dynamic relationship between commercial bank credit and economic growth, two main schools of thoughts are used. One focuses on whether the relationship is "demand following", while the other examines if it is "supply led". According to some theories the link is a causal one, but determining how the impact works and the varying factors, all depend on the type of economy and its financial structure.

Ramlogan and Mitchell-Ryan (2010) postulated that for Trinidad & Tobago the relationship between economic growth and bank credit is one that is "demand following", meaning that as the real sector exhibits growth, the demand for financial instruments will stimulate the financial sector. However, when examining particular sectors, the authors discovered that the relationship was not demand following for all sectors. Select sectors like construction were "supply leading", which implied that more bank credit will lead to higher output in this instance. The "supply leading" hypothesis explains that the financial sector, through the use of its various instruments, act as an impetus for production, which suggests that developed countries, with far superior financial systems, will experience more financial growth than developing nations. Therefore, the authors agreed that in order to diversify the Trinidadian economy, the use of credit should be employed in industries that are supply-leading, in order to influence economic growth. Nevertheless, Islam et al., (2004) hypothesized that developing countries with their unique socio-

economic, political, and institutional history will have a reverse causality from developed nations in relation to finance and growth.

Ndlovu (2013), using a multivariate granger causality and co-integration test, discovered a demand following relationship in the Zimbabwean case, where economic growth lends itself to increased financial expansion. Through the use of five main variables and three control variables, Ndlovu (2013) found that "big" Government can be a hindrance to economic growth and thus states must find a way to both protect their indigenous interests without adversely impacting growth. The author also suggested trade liberalization and job creation to spur economic activity, which would then lead to the development of the financial sector.

In addition, Guo and Stepanyan (2011) noted that in emerging market economies (EME), the relationship between credit and economic growth is more supply led. As the financial markets in these economies grow, the demand for credit expands. Through a series of economic robustness tests, the researchers explained that healthy financial sectors disburse more credit, resulting in elevated economic growth. The authors used a regression analysis to determine credit growth in pre-and post-recession periods in a series of EMEs around the globe. Their analysis revealed that European EMEs often utilized more foreign capital than other EMEs, causing instability in credit growth during recessionary periods. In addition, they found that economies too reliant on foreign capital for their main source of credit are more vulnerable to boom and bust cycles. As a result, macroprudential policies should be employed to counteract such weakness.

Mikhail Stolbov (2015) also conducted a comparable study focusing on the causality between domestic private credit to GDP and real GDP per capita growth within 24 OECD countries during 1989-2013. Employing the unit root tests, standard Granger causality tests and a fully modified ordinary least squares method, the author found that for developed nations of the OECD, there are no widespread causal linkages between credit depth and economic growth. For the countries that did exhibit a relationship, he found that relationship to be more supply led. As a result, the author discourages policymakers from heavy reliance on "bank-based financial development" as a singular force in economic growth, since the study determined that there is no correlation between the depth of one's financial institutions and economic growth.

In another perspective, Abubakar and Gani (2013), using a co-integration Vector Error Correction Model (VECM), examined how credit affects economic growth in the long run in the Nigerian economy. The study revealed that excessive Government borrowing, coupled with high interest rates caused a crowding out effect on private sector investment and negatively impacted economic growth. According to the authors, other financial instruments, along with trade openness, positively impacted economic growth. The economists summarized the relationship to be supply led and concluded that an expansion of the banking sector would better facilitate private investment.

Similarly, Neelam Timsina (2014) conducted a study on bank credit within the Nepalese economy, employing the use of the Johansen co-integration and the Error Correction Model. The model examined bank credit to the private sector, economic growth, government expenditure and the interest rate to test for both a short-run and long-run relationship. It was determined that for Nepal, the relationship between private sector credit and economic growth is supply led. In the long-run, the effects are more positive, as growth in real private sector credit led to growth in real GDP. However, in the short run, a "demand following" phenomenon is exhibited, where the feedback effects of GDP growth spur private sector lending.

Specific to Trinidad and Nigeria, based on the studies reviewed, it is evident that even with the demand following relationship in these developing nations, both financial systems have advanced in line with likesized emerging market economies. However, reform in the financial sectors is essential for further development. In the Zimbabwean case, the demand following relationship of economic growth to financial development has shown that, because of political uncertainty and under-development, the financial sector has seen little progress. Guo and Stepanyan (2011) found that EMEs grew at a faster pace because the supply of financial instruments was fully utilized, leading to economic growth. Whether demand following, or supply leading, the literature has shown that a multitude of factors have to be considered when determining the role credit plays in economic growth.

The empirical result of the study by Aliyu Momman and Alhaji Hashim reveals that commercial banks in Nigeria exhibit a low level of activities and a weak capacity to funds to the Nigerian economy. Another conclusion that can be drawn from the findings of this study is banks are important in stimulating economic growth in Nigeria. Specifically, bank lending contributed

about 86.2 percent variation in the growth of Nigerian economy during the period under review (A. Mamman and Y.A. Hashim, 2014).

Next to this the study is going to review some of the researches conducted in Ethiopia concerning the banking industry and Ethiopian economy growth.

Birhan (2007), using descriptive analysis, concluded that private commercial banks improved in deposit mobilization and loan disbursement in the time period between 1999 and 2006.

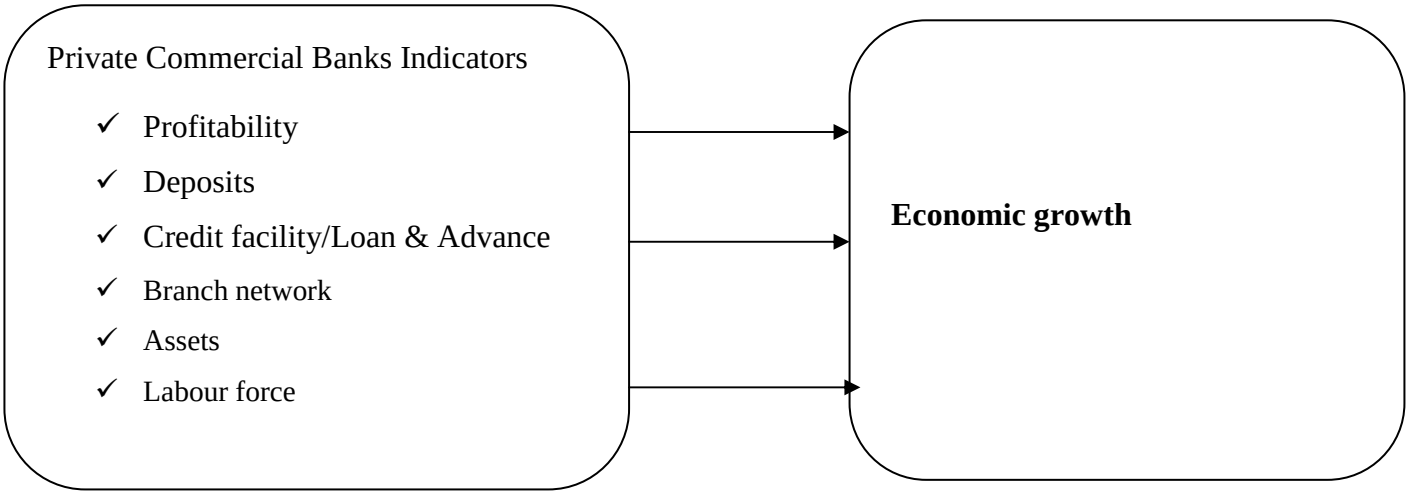
Bechene (2007) analyzed the performance of private banks in Ethiopia taking bank of Abyssinia as a case study in the time period between 1996 and 2003 and came to the conclusion that the bank of Abyssinia faced a huge challenge in collection of the highly increasing outstanding loans granted by the bank due to political risk, corruption, and unexpected decline in the price of coffee and the absence of valuable collateral during for a closure. These problems resulted in enhancing the volume of non-performing loans that forced the bank to hold highest provision for doubtful loans according to the directive of the National Bank of Ethiopia.

Gebre Mariam (2007) using descriptive analysis analyzed the performance of Dashen Bank in relation to deposit mobilization, loans and advances and branch expansion. He came to a conclusion that there was a continuous improvement through the seven operation years (1999/2000-2005/2006). The bank was the highest profitable private bank in the country. In addition, Tesfaye (2006) came to the same conclusion, by analyzing the bank's performance from 1999 to 2004 fiscal year. Tesfaye also added that the bank concentration in the hands of public owned banks, particularly by Commercial Bank of Ethiopia, did not affect the performance of private commercial banks.

Tewabech (2008) tried to assess the role and performance of commercial banks in the Ethiopian economy and concluded that even though the commercial banks are contributing a great role to the economy of the country, they are not equally benefiting the sectors of the economy. The main reason according to the study was that the private commercial banks are opening branches mainly in the cities, they cannot benefit the agricultural society living in the rural part of the country.

Hana (2010) using descriptive analysis concluded that even if Ethiopia is a country having infant economy, and the financial system is not developed as compared to the other countries, financial development has a positive relationship with economic growth. She also added that private commercial banks do not grant loans to the agriculture sector because of fear of risk. These banks engage widely on domestic and international rate which have lower risk and short time return compared to the agriculture sector. Despite they affirm the relationship between private commercial banks and economic growth; they are not clearly investigating the causality direction between private commercial banks and economic growth and exclude some important variables like branch network, and labor force among other variables. Therefore, foregoing facts that, the researcher motivates to fill this gap by using panel data approach analysis.

2.3. Conceptual Framework



Source: Own Design (2018)

Figure 1.1 Conceptual Frame Work

Profits: It stands for the ratio which measures earnings before interest and tax expenses against its total assets. This ratio shows the firm's effectiveness of using its assets to generate earnings. Investor follows this ratio to make decision whether or not to invest in the company. This ratio shows how profitable a company is relative to its total assets. The return on assets (ROA) ratio explains how management is using the company's total assets making a profit. The higher the return, the better organized management is in utilizing its asset base (Alkhazaleh, 2017).

Deposits: Deposit is the money which customers offer to the banks and obtain interest as profit.

It is the liability side of the bank specific. The larger having deposit, the lower profitability of the bank when other factors are remain constant. However, having large amount of deposit enable the bank to grant large amount of different loan ranging from domestic term loan to letter of credit for potential customers by bearing interest under different repayment schedule bases which in tern encourage economic growth.

Loan and advance: 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. 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).

Assets: An asset of the bank is any item legally owned by the bank that has market value. Asset can be categorized into liquid and fixed assets. Liquid assets include cash, reserve deposits at national bank, correspondent balances and cash items. Fixed assets are land, buildings, machineries, and others.

Capital: refers to any financial resources or assets owned by a business that are useful in furthering development and generating income.

Branch network: a branch may be defined as a separate structure from the main office of the bank that accepts deposits. It may do other things such as extending loans. Increased branching lowers a banks average operation cost. Typically, the banks that are not permitted to branch banking experience diseconomies of scale.

Labor force: All people who supply labor for production of goods and services during a specified period. It includes both the employed and the unemployed. Labor force includes the armed forces, the unemployed and first time job-seekers, but excludes homemakers and other unpaid caregivers and workers in the informal sector. It affects economic growth.

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CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Types and Sources of Data

The study is based on secondary data. This study used panel data which cover annual data from 2008 to 2017. The data was sourced from the National Bank of Ethiopia, Ministry of Finance and Economic Cooperation-MoFEC, Central Statistics Agency (CSA). Among 16 private commercial banks in Ethiopia 8 banks were selected. Similarly, in this study, the level of growth of the Ethiopian Economy (represented by RGDP) is dependent variable on profitability, deposits, credit facilities (Loan and Advance), Branch network, gross capital formation; Assets and Labor force (independent variables).

3.2. Method of Data Analysis

3.2.1. Random Effect Model Specifications

A popular panel model is one where the intercepts β0i are different for different individuals but the slope coefficients β_1 and β_2 are assumed to be constant for all individuals. In this case, the model becomes

$$GDP_{it} = \beta_{0i} + \beta_1 X_{1it} + \beta_2 X_{2it} + \varepsilon_t \text{ ----------(3.1)}$$

In the fixed-effects model (3.6) we assumed that all individual differences were captured by differences in the intercept parameter. The intercepts β_{0i} where considered to be ‘‘fixed’’ parameters that we could estimate directly using the least squares estimator. In the random effects model we again assume that all individual differences are captured by the intercept parameters, but we also recognize that the individuals in our sample were randomly selected, and thus we treat the individual differences as random rather than fixed, as we did in the fixed-effects dummy variable model. Random individual differences can be included in our model by specifying the intercept parameters $\beta 0i$ to consist of a fixed part that represents the population average, $\overline{\beta 0}$, and random individual differences from the population average, ui. In equation from this break down is

$\beta 0i = \overline{\beta} + ui$ ----------(3.2)

The random individual differences *ui* , which are called random effects, are analogous to random error terms; where $\overline{\beta 0}$ is a fixed population parameter and ui is a random effect. Thus, the random effect model is specified as follows

$GDP_{it} = \overline{\beta 0} + \beta_1 PROF_{1it} + \beta_2 DEPO_{2it} + \beta_3 LOAN_{3it} + \beta_4 BRAN_{4it} + \beta_5 ASSE_{5it} +$ ----------(3.3)
$\beta_6 LAB_{6it} + \beta_7 CAP_{7it} +_t \varphi$

Whereas $\varphi = \sum \varepsilon t + \sum ui$

Data analysis is a process applying statistical practices to organize, represent, describe, evaluate and interpret data. There are differences between qualitative data analysis and quantitative data analysis. Since this study is mainly used secondary data, the study involves critical analysis and interpretation of figures and numbers, and attempts to find rationale behind the emergence of main findings. Comparisons of primary research findings to the findings of the literature review are critically important.

The data collect with the use of secondary method of data collection are subject to statistical analysis with the use of both inferential and descriptive statistics. The Econometric (Eviews) version 9 was used in analyzing the data that were obtained. Based on this, descriptive analysis, unit root, Granger Causality tests and Random effect analyses were used for this study to examine the role of private commercial banks on economic growth in Ethiopia.

3.2.2. Model Diagnostic Test

Hetersecdastic Test

Among the OLS assumptions, the first diagnostic test which is conducted in this study is Hetersecdastic test. This theoretically expressed as by Brooks (2008,p.133) ‘’var (ut) = σ2 < ∞; it has been assumed thus far that the variance of the errors is constant, σ2 -this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be

Hetersecdastic. White (1980) as cited by (Brooks, 2008 p. 134) is the most popular test of Hetersecdastic.

Autocorrelation Test

The second important diagnostic test which is performed in this research is the autocorrelation test. This assumption of OLS theoretically expressed by the numbers of scholars among that Brooks (2008) and Verbeek (2004) founded. They expressed as; cov(ui ,u j) = 0, this is another assumption that is made of the CLRM's disturbance terms is that the covariance between the error terms over time (or cross-sectional, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are 'auto correlated or that they are 'serially correlated'. The most common test of this assumption is by using the Durbin–Watson test and the Breusch-Godfrey test (Boorks, 2008, p. 144). As far as concerning this paper the researcher used both the Durbin–Watson test and the Breusch-Godfrey test to detect the problem of autocorrelation.

The Normality (Bera-Jarque) Test

Another third important diagnostic test conducted in this paper is the normality assumption (i.e the normally distributed errors). Brooks (2008) stated that the normality assumption ' ($ut \sim N(0, \sigma 2)$)' is required in order to conduct single or joint hypothesis tests about the model parameters. One of the most commonly applied tests for normality is the Bera—Jarque (BJ) test. BJ uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments - the mean and the variance (Brooks, 2008, p.161). In case of this study, the researcher used BJ normality test to test the null hypothesis of normally distributed errors assumptions.

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3.3. Econometric Model Specification

Basically, any econometric analysis follows sequentially several steps, before employing the final model. It is presupposed to measure the basic assumptions, i.e. testing the unit root process to understand the order of getting stationary i.e. level I (0) or first difference I (1). If the data is not getting stationary in level, it must be differenced enough to achieve stationary whether at first difference or second difference. Once the unit root process is completed then it can move to measure the relationship whether the series is co integrated in long run or short run. For checking the relationship, we have to use panel co integration test. After that the study used granger causality test for examine the role of private commercial banks on economic growth in the selected private commercial banks.

Thus, we can describe the economic growth function of Ethiopia in the following way:

RGDP = f (PROF, DEPO, LOAN, ASSE, BRAN, LAB, CAPI)

All variables are changed to logarithm to minimize the variation among the data and hence to reduce the heteroscadastcity problems.

3.3.1. Panel Unit Root Test

Unit root tests is an integral part of time series analysis, as mostly the economic time series data are non-stationary and without bringing data to stationary, application of any regression model may result in to spurious or misleading results. For panel data the test of unit root was developed in the beginning of 2000. There after several models have been developed for testing the unit root in panel data. The test of panel unit root used for checking the non-stationary in economic series is done by differencing and derivating the data series. Basically the panel unit root tests are follows same version of standard dynamic models, such as;

$$yit=\rho\, y_{it} - 1 + \delta 0 + \delta 1t + ni + vt + \varepsilon it \text{----------(3.4)}$$

From the model testing the coefficient of ρ is equal to one. Subscript denotes i = (1, 2, ….., N) distinguishes the N individuals included in the panel. Recent developments in the panel unit root tests include: Levin, Lin and Chu (LLC) (2002), Im, Pesaran and Shin (IPS) (2003), Maddala and Wu (1999), Choi (2001), and Hadri (2000).

Before applying the unit root test, it is necessary to check the data type. Since our data is balanced panel i.e. equal number of observation in both time series and cross section, we must use appropriate test of unit root which will support the balanced panels. From among different panel unit root tests developed in the literature, LLC and IPS are the most popular. Both of the tests are based on the ADF principle. However, LLC assumes homogeneity in the dynamics of the autoregressive coefficients for all panel members. In contrast, the IPS is more general in the sense that it allows for heterogeneity in these dynamics. Hence the present study adopts the LLC unit root test model.

By specifying a separate ADF regression for each cross section (country):

$\Delta yi.t = \alpha i + \beta iyi, t-1 + \sum_{j=1}^{pi} \rho i.j\, \Delta yi, t-j + \varepsilon_{i,t}$ ----------(3.5)

where yi,t (i=1, 2,…..,N; t=1,2,…….,T) is the series for panel member (country) i over period t, pi is the number of lags in the ADF regression, and the error terms $\varepsilon_{i,t}$ are assumed to be independently and normally distributed random variables for all i's and t's with zero means and finite heterogeneous variances σ_i^2.

Hence, the null hypothesis to be tested is:

$H_0 : \beta_i = 0,\ \forall i$ Against the alternative hypothesis:

$$H_1 : \begin{cases} \beta_i = 0 & \text{For some i's} \\ \beta_i \prec 0 & \text{For at least one i.} \end{cases}$$ ----------(3.6)

The alternative hypothesis simply implies that some or all of the individual series are stationary.

3.3.2. Panel Co integration Test

The concept of co integration was first introduced into the literature by Granger (1980). Co integration implies the existence of a long-run relationship between economic variables. The principle of testing for co integration is to test whether two or more integrated variables deviate significantly from a certain relationship (Abadir and Taylor, 1999). In other words, if the

variables are co integrated, they move together over time so that short-term disturbances will be corrected in the long-term. This means that if, in the long-run, two or more series move closely together, the difference between them is constant. Otherwise, if two series are not co-integrated, they may wander arbitrarily far away from each other (Dickey et. al., 1991).

Further, Granger (1981) showed that when the series becomes stationary only after being differenced once (integrated of order one), they might have linear combinations that are stationary without differencing. In the literature, such series are called “co integrated”. If integration of order one is implied, the next step is to use co integration analysis in order to establish whether there exists a long-run relationship among the set of the integrated variables in question.

3.3.3. Panel Granger Causality Test

Kao Residual panel co integration method tests only for the existence of long run relationships. The tests indicate the presence or absence of long run links between the variables, but do not indicate the direction of causality when the variables are co integrated. Therefore, we apply panel granger causality test based on Granger’s (1969) concept to test the causality among the variables. Granger causality tests measures the causal relationship with bivariate data sets and these relationships can be expressed as unidirectional or bidirectional. The panel Granger causality tests takes the following form;

$$Y_{it} = \alpha_0 + \sum_{j=1}^{m} \alpha_j Y_{it-j} + \sum_{j=1}^{m} \delta_j X_{it-j} + f_{yi} + u_{it} \quad \text{----------(3.7)}$$

$$X_{it} = \beta_0 + \sum_{j=1}^{m} \beta_j Y_{it-j} + \sum_{j=1}^{m} \gamma_j X_{it-j} + f_{xi} + \nu_{it} \quad \text{----------(3.8)}$$

Where Y_{it} and X_{it} are the two co-integrated variables, i=1,…..,N represents cross-sectional panel members, u_{it} and ν_{it} are error terms. This model differs from the standard causality model in that it adds two terms, f_{xi} and f_{yi} which are individual fixed effects for the panel member i.

In the equations above, the lagged dependent variables are correlated with the error terms, including the fixed effects. Hence, estimates of the above model will be biased. The remedy is to remove the fixed effects by differencing. The resulting model is:

$$\Delta Y_{it} = \sum_{j=1}^{m} \alpha_j \Delta Y_{it-j} + \sum_{j=1}^{m} \delta_j \Delta X_{it-j} + \Delta u_{it}$$

$$\Delta X_{it} = \sum_{j=1}^{m} \beta_j \Delta Y_{it-j} + \sum_{j=1}^{m} \gamma_j \Delta X_{it-j} + \Delta v_{it}$$

Assuming that u_{it} and v_{it} are serially uncorrelated, then, to test for the causality, the joint hypotheses $\delta_j = 0 \quad for\ j = 1,.....,m$ and $\beta_j = 0 \quad for\ j = 1,.....,m$ is simply tested.

3.4. Definitions of the Variables and their Expected Signs

This study addressed the role of private commercial banks on the economic growth in Ethiopia and its causality. To do that, we need to define and explain explanatory variables which could also influence economic growth (RGDP). In empirical analyses, there are also different choices of determining factor of economic growth. Sometimes the set of contributing factor are chosen relying on the availability of data. Besides deposit, loan and advance/credit facility the following additional determinants are thought to influence economic growth.

Real Gross domestic product (RGDP): Measures the monetary value of final goods and service that is, those that are bought by the final user-produced in a country in a given period of time which is a measure of a nation's economic performance. Hence, this study used RGDP to proxy the economic growth.

Profitability (PROF): Profitability and performance of banks is key to economic growth; the strength of most industries rely on the availability of finance provided within the economy by the banks to facilitate transaction. It is on this premise that this research was carried on to determine how profitability in the banking industry plays role in economic growth in Ethiopia. Profitability is calculated by return on total assets. It stands for the ratio which measures earnings before interest and tax expenses against its total assets. This ratio shows the firm's effectiveness of

using its assets to generate earnings. Investor follows this ratio to make decision whether or not to invest in the company. This ratio shows how profitable a company is relative to its total assets. The return on assets (ROA) ratio explains how management is using the company's total assets making a profit. The higher the return, the better organized management is in utilizing its asset base (Alkhazaleh, 2017). The better organized management is in utilizing its asset, the more investment which encourage economic growth of the country. The researcher expected that profitability to have significant and positive effect on economic growth (Francis, et al., 2005)

Deposits (DEPO): Deposits are the money which people offer to banks and obtain interest as profit. Without having deposits banks are unable to invest and lend anywhere. There are different types of deposits like call deposits, saving deposits, current deposits, and fixed deposits. In the reality deposits have negative effects on the profitability of the bank but the higher having deposits, the larger to grant credit facility which earns interest. The larger the loan granted, the more interest earned which in return invested in the economy. Hence the researcher expects Deposit is to have negative and significant effect on economic growth.

Credit facilities/Loan and Advances (LOAN): A loan or collection of loans taken on by a corporation. These loans can be various different types, reliant upon the necessities of the company, and can diverge from letters of credit to term loans, and can be committed or uncommitted. After receiving deposits banks give loan to needy people and obtain interest. 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. 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. 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 (loanable 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. Hence that, the expectation of the researcher is Private Commercial bank's credit facility is significantly and positively affects economy growth.

Assets (ASSE): For any individual or firm, including a banking firm, an asset is any item legally owned by that person or business that has a market value. For instance, when a commercial bank makes a loan to a business, that loan represents a legal obligation of the business to repay the loan principal and interest to the lending bank within the specified period. Consequently, the loan is an asset of the bank (Miller and Vanhoose, 1993). Miller and Vanhoose categorized the key assets of commercial banks in to three, which are loans, securities, and cash assets. Loans include commercial and industrial loans, real estate loans, consumer loans, and very short term loans that banks make in the federal funds market or through purchases of repurchase agreement. Securities include government securities and municipal and state bonds. Cash assets include vault cash, reserve deposits at Federal Reserve banks, correspondent balances, and cash items in the process of collection. Therefore, asset can be considered as another important variable having insignificant effect on economic growth.

Branch Network (BRAN): A branch may be defined as a separate structure from the main office of the bank that accepts deposits. It may do other things such as extending loans. But generally, the key function for the legal distinction is offering deposit services. Laws governing the number and type of branches may affect the amount of deposits a bank can obtain as well as type of local competition it faces from other banks and financial intermediaries (Auebach, 1985). Branch banking is essential to a banks survival. Branching is not just a costly endeavor by banks to provide customer convenience, but increased branching lowers a banks average operation cost. Typically, the banks that are not permitted to branch banking experience diseconomies of scale. This means that these banks are forced to have an efficiently large banking office because they cannot run branches which in turn lead to the conclusion that branch banking restriction leads to

inefficiency and decline in performance (Vaish, cited in Shumet, 2015). Hence, Private Banks' branch network is expected to significantly and negatively affect economic growth.

Capital (CAPI): For instance, the traditional interpretation of the "bank lending channel" has not paid attention to bank equity; bank capital is traditionally interpreted as an "irrelevant" balance-sheet item (Friedman, 1991; Van den Heuvel, 2003). Equity capital can be the major source of funds. Bank capitalization, however, influences the "bank lending channel" owing to imperfections in the market for debt. In particular, bank capital influences the capacity to raise uninsured forms of debt and therefore banks' ability to contain the effect of a deposit drop on lending. Low capitalized banks, perceived to be more risky by the market and have greater difficulty in issuing bonds and therefore are less able to shield their credit relationships (Kishan and Opiela, 2000). When equity is sufficiently low (and it is too costly to issue new shares), banks reduce lending because prudential regulations establish that capital has to be at least a minimum percentage of loans (Bolton and Freixas, 2001). Therefore, the efficiency of bank in terms of equity capital is measured by ROE. ROE is defined as after tax net income divided by total equity is taken as a proxy variable to measure the capital efficiency of the bank (Nam et.al, 2007). This paper also used ROE as a capital efficacy measurement.Therefore, the researcher expectsPrivate Banks' capital efficiency is to have a positive and significant impact on the economic growth.

Labor force (LAB): labor force comprises people ages and older who meet the international labor organization definition of the economically active population: all people who supply labor for production of goods and services during a specified period. it includes both the employed and the unemployed. Labor force includes the armed forces, the unemployed and first time job-seekers, but excludes homemakers and other unpaid caregivers and workers in the informal sector. Expect sign is positive and significant impact on RGDP.

CHAPTER FOUR

4. RESULT AND DISCUSSIONS

4.1. Descriptive Analysis

Table 4.1 demonstrates the summary of descriptive statistics for the variable values used in the sample. The summary of descriptive statistics includes the mean, standard deviation, minimum and maximum of one dependent variable (RGDP) and seven explanatory variables (DEPO, LOAN, PROF, ASSE, BRAN, CAPI and LAB). The data contain sample of eight private commercial banks in Ethiopia for the past ten years (2008 – 2017).

The descriptive statistics summarized in Table 4.1 are a collection of measurements of two things: location and variability. Location tells one the central value of the variables (the mean is the most common measure of this). Variability refers to the spread of the data from the center value (i.e. variance, standard deviation).

Table 4. 1: Descriptive statistics

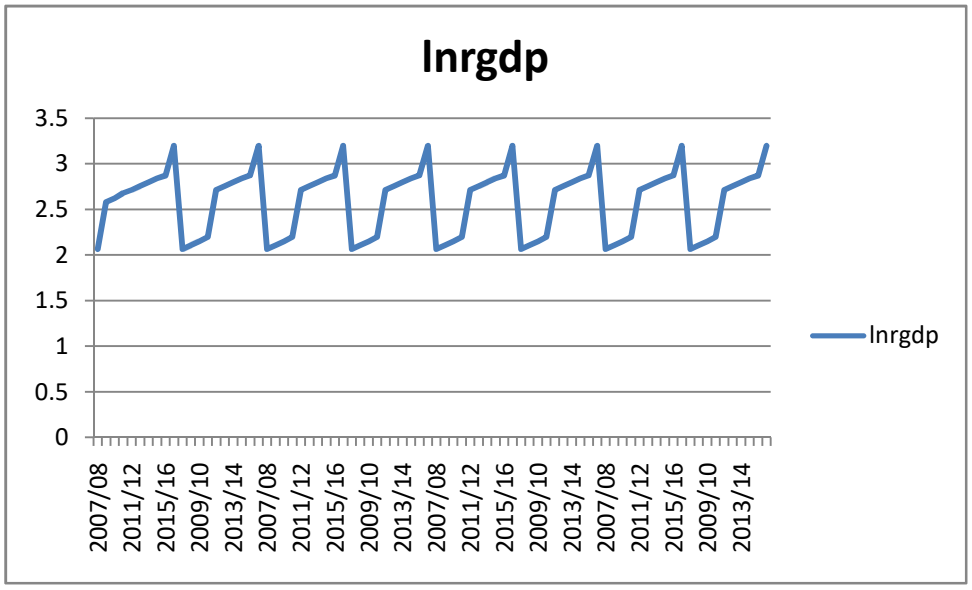
	LNRGDP	LNASSE	LNBRAN	LNCAPI	LNDEPO	LNLAB	LNLOAN	LNPROF
Mean	2.587367	3.898340	1.894276	2.956014	3.696455	7.970440	3.302035	1.055284
Median	2.733919	3.952512	1.851215	2.988990	3.763268	7.960174	3.355662	1.060928
Maximum	3.197859	4.512524	2.530200	3.580651	4.358544	8.115902	3.939225	1.085257
Minimum	2.065206	2.758912	1.230449	2.136721	2.574031	7.908487	2.295127	1.017050
Std. Dev.	0.374233	0.376451	0.300367	0.347037	0.390490	0.056289	0.334388	0.025536
Skewness	-0.159047	-0.969545	0.111679	-0.426964	-0.792981	1.519229	-0.782902	-0.235593
Kurtosis	1.704906	3.856342	2.401120	2.552267	3.614711	4.827726	3.367280	1.438961
Jarque-Bera	5.928177	14.97796	1.361821	3.098861	9.643815	41.90937	8.622126	8.862858
Probability	0.051607	0.000559	0.506156	0.212369	0.008051	0.000000	0.013419	0.011897
Sum	206.9893	311.8672	151.5421	236.4811	295.7164	637.6352	264.1628	84.42271
Sum Sq. Dev.	11.06395	11.19548	7.127383	9.514317	12.04610	0.250309	8.833419	0.051517
Observations	80	80	80	80	80	80	80	80

Source: Own Computation (2018)

The table 4.1 represents the descriptive statistics of the model. In the above table LNRGDP is a dependent variable and LNPORF, LNASSE, LNBRAN, LNCAPI, LNDEPO, LNLAB and LNLOAN are independent variables. The sample size comprises of 80 observations from the period of 2008 to 2017 of eight private commercial banks. The minimum and maximum value of LNRGDP (2.065206) and (3.197859) respectively, whereas the mean value is (2.587367) and standard deviation is (0.374233). The minimum and maximum value of LNDEPO (2.574031) & (4.358544) respectively, whereas the mean value is (3.696455) and standard deviation is (0.390490). LNASSE having minimum value (2.758912), maximum value (4.512524), mean value (3.898340) and standard deviation (0.376451). LNBRAN having minimum value (1.230449), maximum value (2.530200), mean value (1.894276) and standard deviation (0.300367). LNCAPI having minimum value (2.136721), maximum value (3.580651), mean value (2.956014) and standard deviation (0.347037). LNLAB having minimum value (7.908487), maximum value (8.115902), mean value (7.970440) and standard deviation (0.056289). LNLOAN having minimum value (2.295127), maximum value (3.939225), mean value (3.302035) and standard deviation (0.334388) and LNPROF having minimum value (1.017050), maximum value (1.085257), mean value (1.055284) and standard deviation (0.025536)

4.2 Trend in Private Commercial Banks

4.2.1. Trend in RGDP

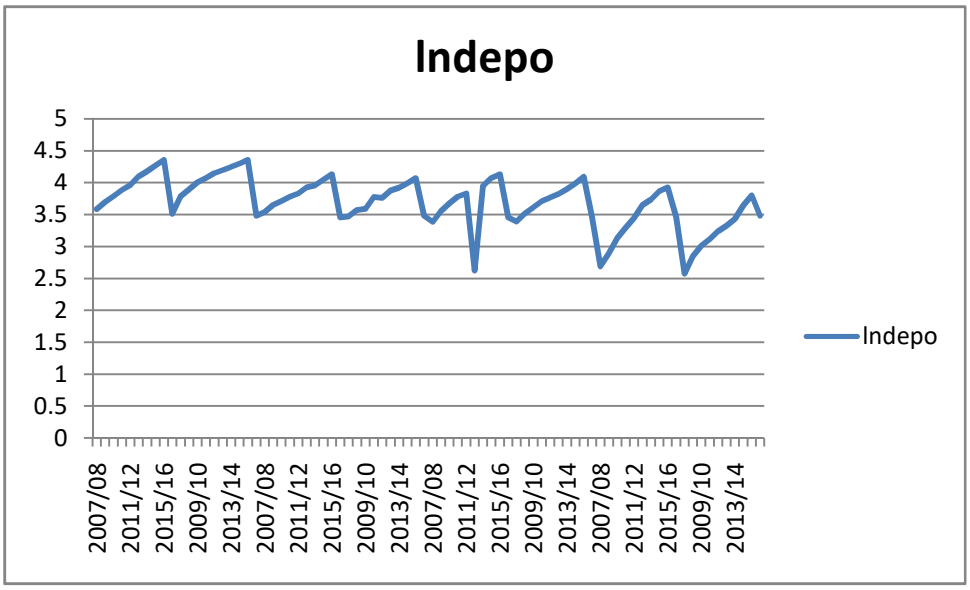


Source: Own Computation (2018)

Figure 4.1: Trend in RGDP

As can be seen from the above figure 4.1 the RGDP of Ethiopia is increasing at one time and decreasing at the other time. It is fluctuating over time. This may implies that due to challenging macroeconomic and weather conditions. The Ethiopian economy which had exhibited 9.8 percent average annual growth during 2010/11-2015/16, registered 8 percent growth in 2015/16 despite challenging macroeconomic and weather conditions. The 8 percent real GDP growth was 3.2 percentage point lower than base case scenario GTPII target set for the than 1.6 percent average growth estimated for Sub - Saharan Africa (World Economic Outlook Update, July 2016)

4.2.2. Trend in Private Commercial Banks Deposits



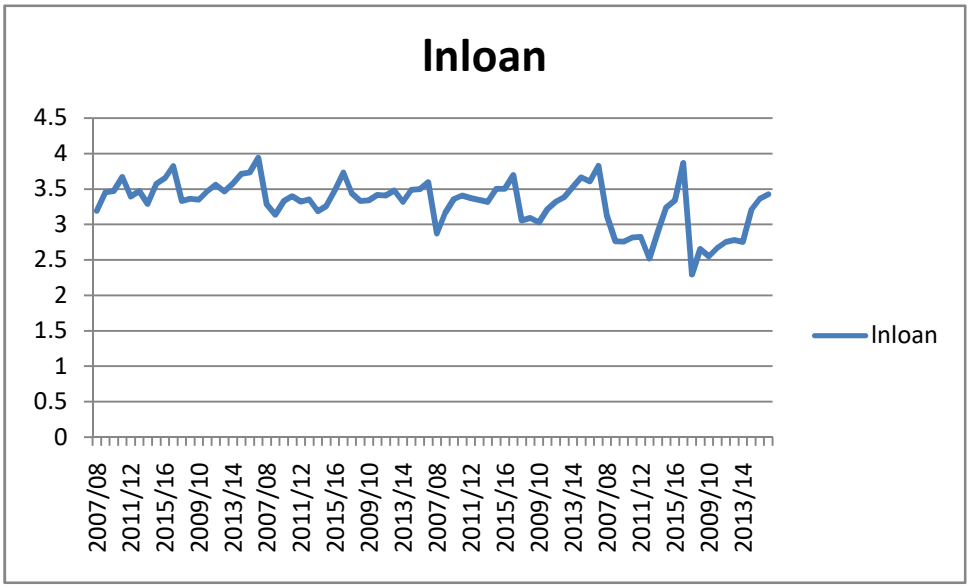
Source: Own Computation (2018)

Figure 4.2: Trend in Private Commercial Deposits

As above figure 4.2 shows that the trend of private commercial banks' deposit is not constant. Thus, it might be because of high competition among commercial banks increases from time to time that they share the limited resources and scarce resources are not adequately mobilized by commercial banks. There is also less habit to use banks in Ethiopia rather than using informal financial sectors, due to banks need high collateral during loan granting.

However, the NBE annual reports (2016/17) stated deposit liabilities of the banking system topped Birr 568.8 billion, reflecting 29.8 percent annual growth rate. Saving deposits grew by 35.2 percent followed by time deposits (26.4 percent) and demand deposits (24 percent). Of the total deposits, saving deposits accounted for 51.6 percent, demand deposits 37.3 percent and time deposits 11.1 percent. The share of private banks in deposit mobilization increased to 35.5 percent from 33.6 percent last year

4.2.3. Trend in Private Commercial Banks Loan and Advance



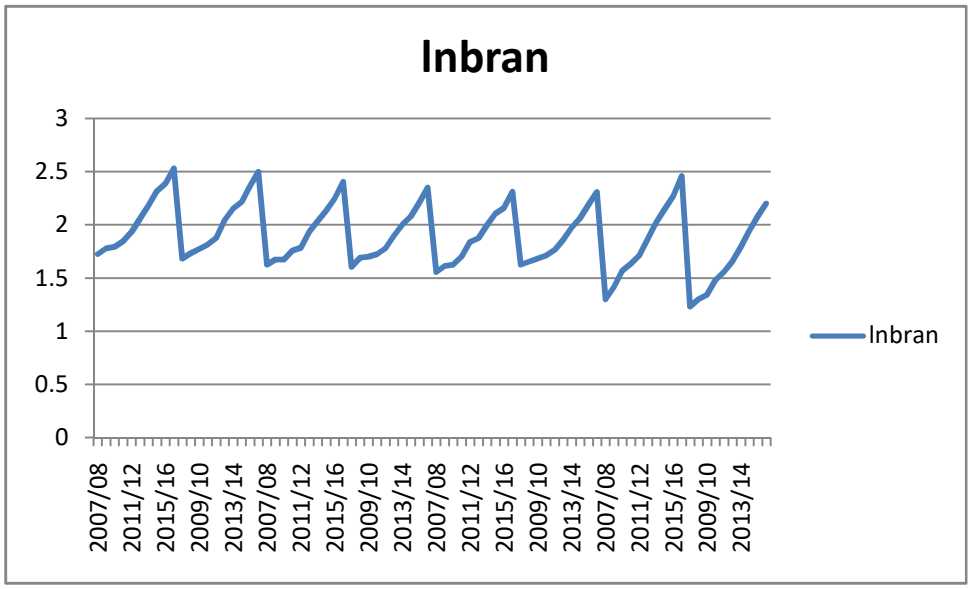
Source: Own Computation (2018)

Figure 4.3 Trend in Private Banks loan and advance

As the above figure indicates loan and advance trend is not constant. Loan and advance is the integral part for the profitability of any commercial banks as it earns interest. To raising more funds sufficient deposit mobilization is necessary.

According to NBE annual report (2016/17) of the total new loans, about 55.6 percent was provided by private banks. Raising funds through borrowing by the banking industry was not an important source of resource mobilization in Ethiopia as most of the banks were sufficiently liquid due to increased deposit mobilization and collection of loans.

4.2.4 Trend in Branch Network

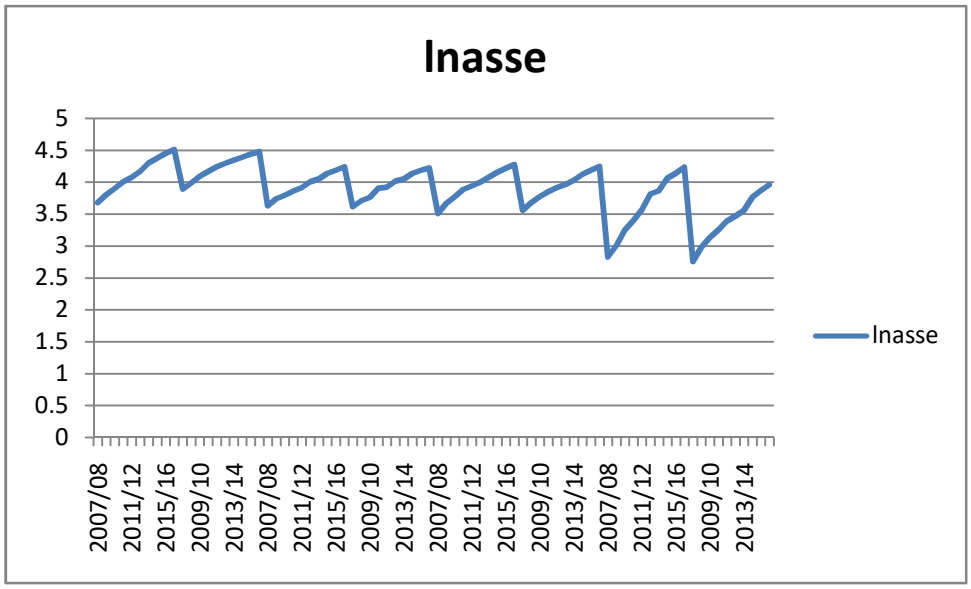


Source: Own Computation (2018)

Figure 4.4 Trends in Branch Network

As the above figure 4.4 shows that the branch network is also fluctuating time to time. This implies that as the bank expansion its branch network, it incurs high costs which may reduces the profitability of the banks in the short run. In the long run sufficient resource mobilization attended and raising funds through borrowing and earn profits. Which in turn spurs economic growth.

4.2.5 Trend in Asset

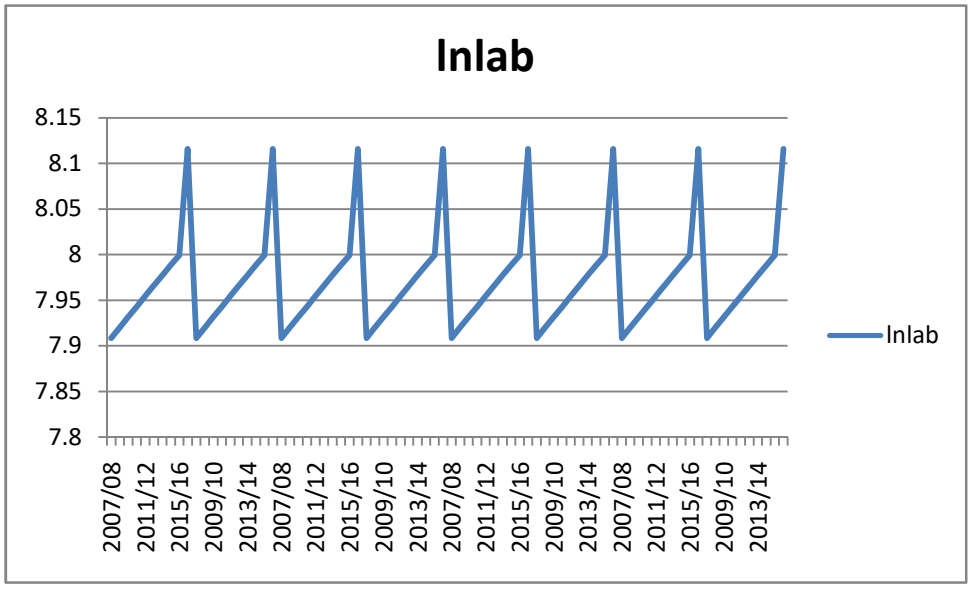


Source: Own Computation (2018)

Figure 4.5 Trends in Asset

Trend in asset is following the same pattern with that of branch network. In the short run asset showing fluctuate trend. After resources are fully mobilized it might be maximized.

4.2.6. Trend in labor force

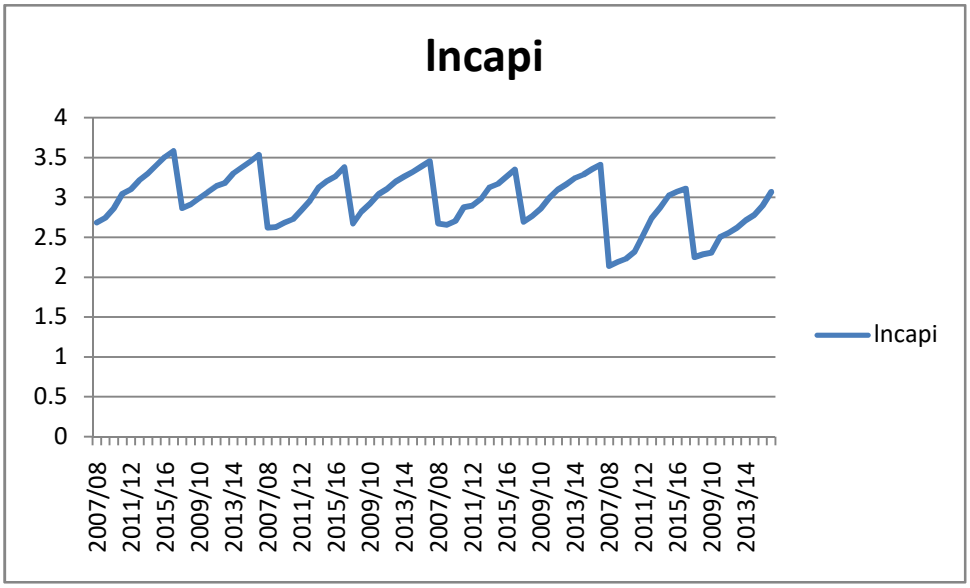


Source: Own Computation (2018)

Figure 4.6 Trends in Labor force

As can be seen from the above graph the trend in labor force is not constant due to the macroeconomic problem and weather condition in the country.

4.2.7. Trend in Capital formation



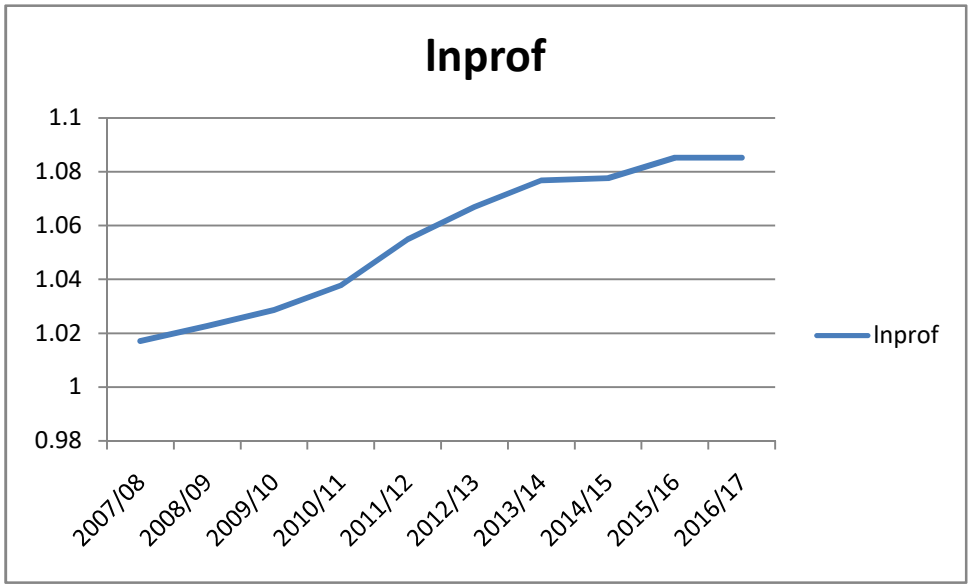
Source: Own Computation (2018)

Figure 4.7 Trends in Capital Formation

4.2.8. Trend in Profits of Private Commercial banks

As can be seen from the following each banks profit graph, all banks profit increasing at increasing rate as time increasing.

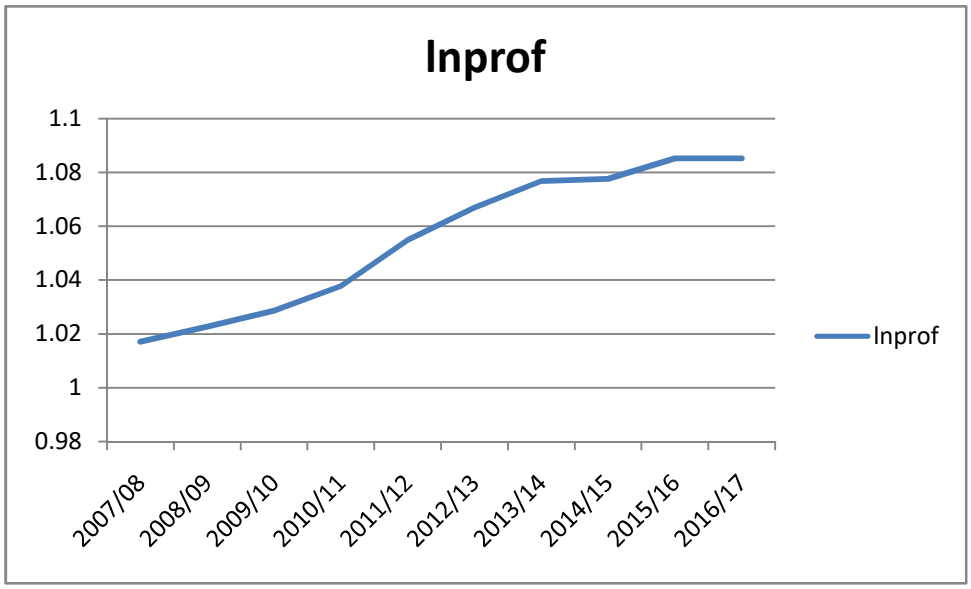
1) Awash Bank Profit Trend



Source: Own Computation (2018)

Figure 4.8 Awash Bank Profit Trend

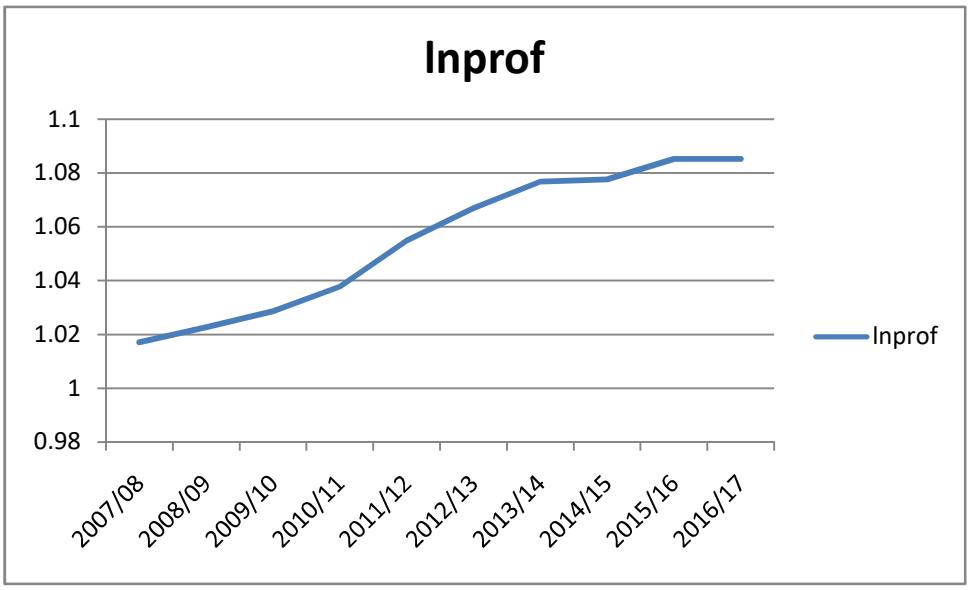
2) Dashen Bank Profit Trend



Source: Own Computation (2018)

Figure 4.9 Dashen Bank Profit Trends

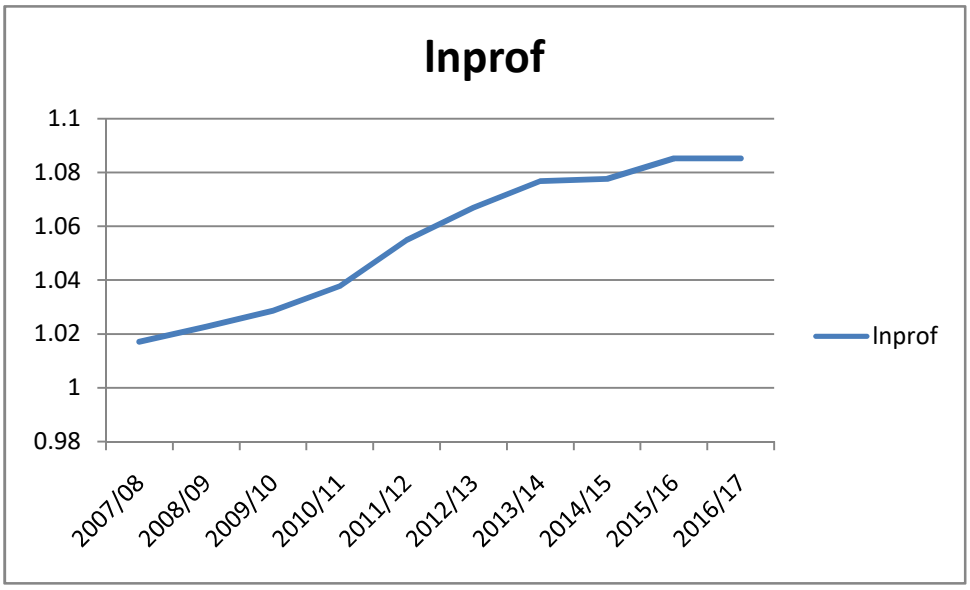
3) Bank of Abyssinia Profit Trend



Source: Own Computation (2018)

Figure 4.10 Bank of Abyssinia Profit Trends

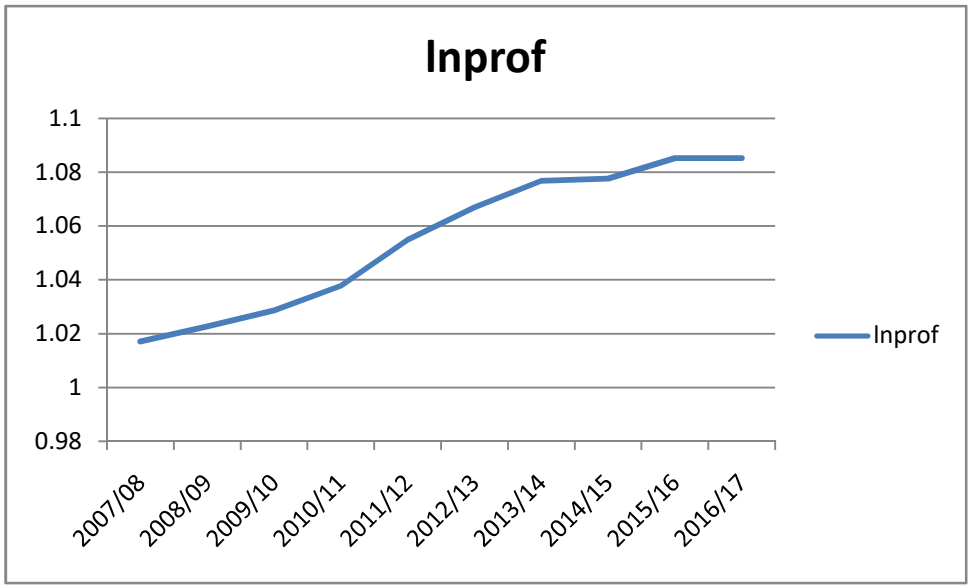
4) Wegagen Bank Profit Trend



Source: Own Computation (2018)

Figure 4.11 Wegagen Bank Profit Trends

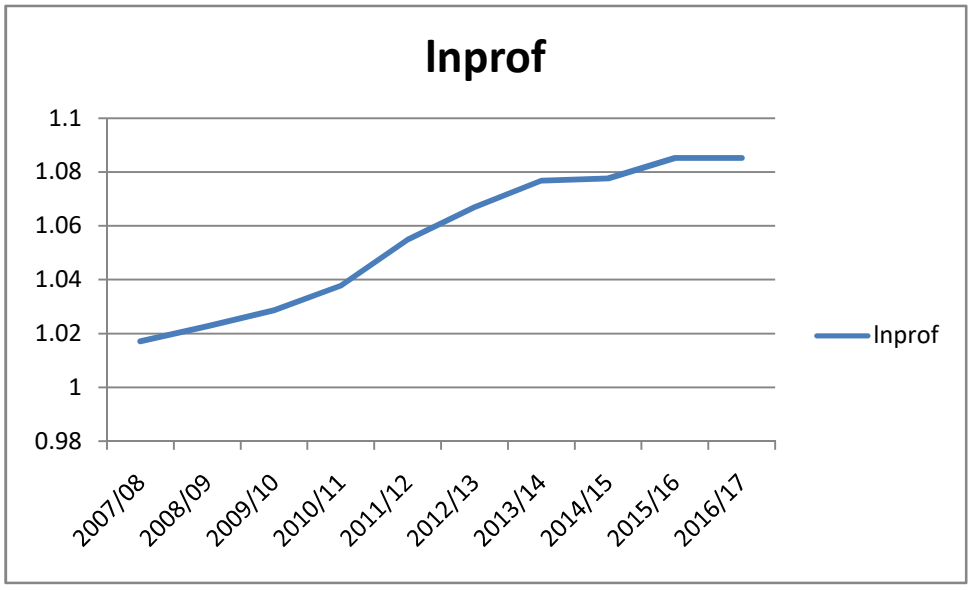
5) United Bank Profit Trend



Source: Own Computation (2018)

Figure 4.12 United Bank Profit Trends

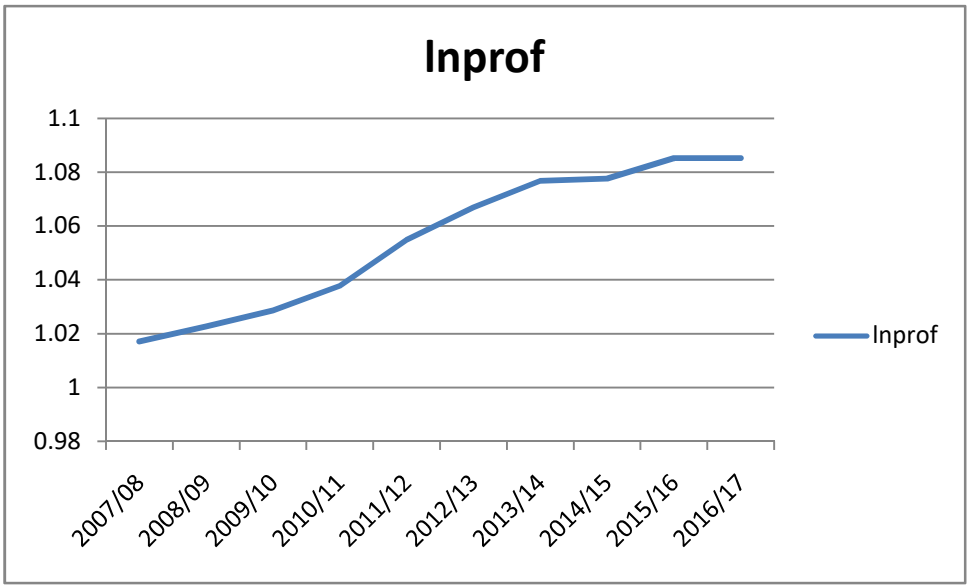
6) Nib Bank Profit Trend



Source: Own Computation (2018)

Figure 4.13 Nib International Bank Profit Trends

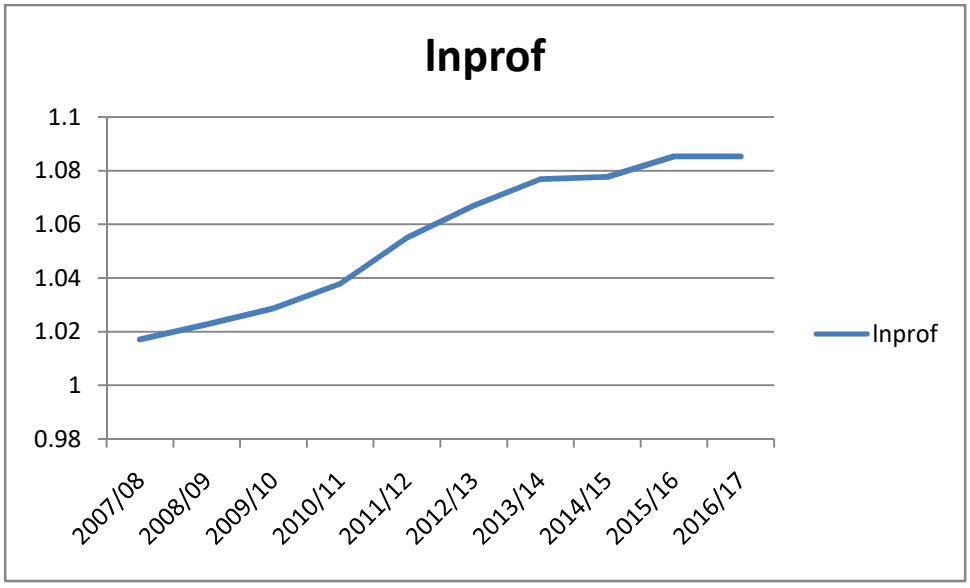
7) Cooperative Bank of Oromia Profit Trend



Source: Own Computation (2018)

Figure 4.14 Cooperative Bank of Oromia Profit Trends

8) Lion International Bank Profit Trend



Source: Own Computation (2018)

Figure 4.15 Lion International Profit Trends

4.3. Unit Root Test result

Table 4.2 below shows the results for the unit root tests by using Levin, Lin & Chu t* conducted for the variables under this study. The null hypothesis proposes that some variables have unit root test. This means that the error terms of the variable in question is serially correlated. If the data has unit root test, it is non-stationary, non-stationary process is when the error term of the variables are serially correlated, the mean is not zero and variance is not constant. It is the opposite of stationary process where the data must satisfy the assumptions underlying the classical regression model.

The stationary of data is important because it affects the long run relationship of the variables and model in general. The non-stationary of the variables cause's previous values of the error terms yt-1 to have none declining effect on the current value of yt as time progresses which in turn leads to spurious regression.

As the table below shows that certain variables are non-stationary at level but with first difference all variables become stationary.

Table 4. 2: Levin, Lin & Chu t* Unit Roots Tests

Level			**1st Difference**		
Variables	**statistics**	**pro**	**Statistics**	**Pro**	**Stationary**
LNRGDP	-1.98911	0.0233	-1.74535	0.0405	I(1)
LNASSE	-5.11832	0.0000	-2.14229	0.0161	I(1)
LNBRAN	-4.71378	0.0000	-8.13567	0.0000	I(1)
LNCAPI	-3.10876	0.0009	-10.7616	0.0000	I(1)
LNDEPO	12.8053	1.0000	-3.38754	0.0004	I(1)
LNLAB	3966.66	1.000	-3.91364	0.0000	I(1)
LNLAON	-0.48934	0.3123	-3.49833	0.0002	I(1)
LNPROF	-4.60066	0.0000	-3.91836	0.0000	I(1)

Source: Own Computation (2018)

4.4. Panel Co integration Test

Having established that the variables are integrated of the first order, the second step is testing for the co integration relationship between the variables, in order to determine if there is a long-run relationship between the variables. The test for the long-run relationship among the variables using Kao Residual Co-integration was conducted. Table 4.3 reports the panel co integration test results.

Table 4. 3: Kao Residual Cointegration Test Results

Kao Residual Cointegration Test

Series: LNRGDP LNASSE LNBRAN LNCAPI LNDEPO LNEXPO LNFOREIG
LNINF LNLAB LNLOAN LNPROF

Date: 12/18/18 Time: 14:31

Sample: 1 80

Included observations: 80

Null Hypothesis: No cointegration

Trend assumption: No deterministic trend

User-specified lag length: 1

Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-3.488506	0.0002
Residual variance	0.010975	
HAC variance	0.008600	

4.5. Panel Causality Test

Once we have established a co-integration relationship between the variables, then we may conclude that there exists a long-run relationship between the variables. We therefore postulate that there is (Granger) causality between variables at least in one direction and possibly in both

directions. Therefore, after confirming the long run relationship between our variables, we next test for their causality hypothesis. We want to know whether asset, deposits, loans and advances, profitability, branch network, labor force, capital, can be used to predict the GDP. The result of the causality tests is displayed in the table 4.4 below.

Table 4. 4: Pair wise Granger Causality Tests using Eviews 9

Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
Ho: LNPROF does not Granger Cause LNRGDP H1: LNPROF does Granger Cause LNRGDP	64	9.57161	0.0003
Ho: LNLOAN does not Granger Cause LNRGDP H2: LNLOAN does Granger Cause LNRGDP	64	1.02386	0.3655
HO: LNDEPO does not Granger Cause LNRGDP H3: LNDEPO does Granger Cause LNRGDP	64	1.26810	0.2889
HO: LNBRAN does not Granger Cause LNRGDP H4: LNBRAN does Granger Cause LNRGDP	64	3.31171	0.0433
HO: LNCAPI does not Granger Cause LNRGDP H5: LNCAPI does Granger Cause LNRGDP	64	2.55541	0.0862
HO: LNASSE does not Granger Cause LNRGDP H6: LNASSE does Granger Cause LNRGDP	64	1.08829	0.3435
HO: LNRGDP does not Granger Cause LNBRAN H7: LNRGDP does Granger Cause LNBRAN	64	10.7346	0.0001

Source: Own Computation (2018)

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. After applying the causality test we found the unidirectional causal relationship of profit and loan & advance with economic growth. And we found bidirectional causal relationship of branch network with economic growth. On the other side we found no causal relationship of asset, deposit and capital with economic growth.

Table 4.5: Random Effect model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-25.88140	4.898576	-5.283455	0.0000
LNASSE	0.228605	0.154779	1.476971	0.1440
LNBRAN	-0.351106	0.190690	-1.841243	0.0697*
LNCAPI	-0.115646	0.139935	-0.826426	0.4113
LNDEPO	-0.083901	0.073416	-1.142819	0.2569
LNLAB	1.899061	0.639712	2.968619	0.0041***
LNLOAN	0.127817	0.074426	1.717363	0.0902*
LNPROF	12.63761	1.244107	10.15797	0.0000***
R-squared	0.927548	Mean dependent var		1.763678
Adjusted R-squared	0.920504	S.D. dependent var		0.372615
S.E. of regression	0.105059	Sum squared resid		0.794688
F-statistic	131.6806	Durbin-Watson stat		1.858259
Prob(F-statistic)	0.000000			

*And *** denotes rejection of null hypothesis at 10% and 1% significance level respectively.

Source: Own Computation (2018)

In the above table RGDP is a dependent variable and asset, branch network, capital efficiency, labor force, deposit, loan and profitability are independent variables. Table 5 gives us the value of R square, which represents the correlation between the observed values and predicted values of the dependent variable. R-Square is called the coefficient of determination and it gives the adequacy of the model. Here the value of R-Square is 0.927 that means the independent variable in the model can predict 92% of the variation in dependent variable. The p-value is given by

0.000 which is less that 0.05, which shows the significance of our model. The values of Durbin-Watson statistics for dependent variable in our case is very near to 2.00(1.858259), this indicates that there is no autocorrelation exists in our study and the regression models assume that the error deviations are uncorrelated.

The values of coefficients beta and constant are used to construct the regression model, the model is shown below:

RGDP= -25.88 + 0.22 (LNASSE) -0.35 (LNBRAN) -0.11(LNCAP) -0.08 (LNDEPO) + 1.89 (LNLAB) + 0.12 (LNLOAN) + 12.63(LNPROF)

Beta coefficient shows the tendency of an independent variable to respond against dependent Variables. Therefore, greater value of beta indicates the larger impact on dependent variable and vice versa. Labor force (1.89) and profitability (12.63) are having positive and significant impact on the economic growth because the p-value is less than 0.05

Profit (LNPROF): it registered the expected positive sign and is highly significant at 1 % level of significance. A percent increase in profit, results 12.63 percent increase in RGDP, keeping other factor constant. This implies that the more the profitable private commercial banks the greater investment in the other sectors which in turn increases economic growth of a country.

Labor force (LNLAB): it registered the expected positive sign and is highly significant at 1% level of significance. A percent increase in labor force, results 1.89 percent increase in RGDP, other factors are remaining constant. This also implies that using skilled man power or employments of private commercial banks will increases trust of the people on the banks. On other hands it helps to render quality services to the clients as well as reducing unemployment level of the country which in turn helps to spur GDP.

Loan and advance (LNLOAN): Having positive relationship and significant impact on the economic growth. A one percent increasing in loan and advances results 0.1278% increases in RGDP on average

Asset (LNASSE): having positive expected sign and insignificant contribution to real GDP because is p-value higher than 0.05. It indicates that there is high managerial cost of private commercial banks and resources are not efficiently allocated.

Deposit (LNDEPO): deposit is logically has direct and positive relation with loan and advance of the commercial banks. Since deposit is liabilities of commercial banks if not loan granted to customers it is negatively affected the profitability of the commercial banks which in turn negatively affect economy growth. Therefore, as we seen from the above table deposit (LNDEPO) has negative and insignificant impact on economic growth.

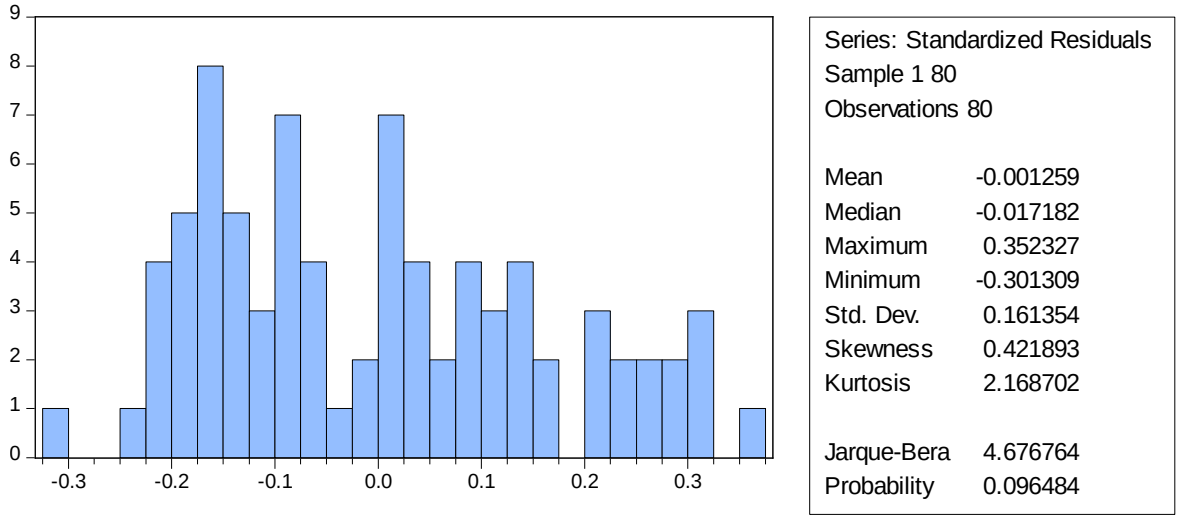
Branch Network (LNBRAN): It registered expected sign, which is negative and significant at 10% level of significance. A one more percent increasing in branch network results decreasing the RGDP by 0.0697% keeping other factors remain constant.

4.6. Diagonestic Tests

4.6.1. 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.

Figure 4.16: Test of Normality



Source: Own drawing (2018)

Jarque-Bera is statistically in significant because its corresponding p-value, 0.09648, is greater than the standard p-value 0.05. Therefore, it is possible to generalize in the way that the residuals are normally distributed and do not have potential problems on the specified model.

4.6.2. Serial Autocorrelation

The serial correlation test can be done using Breusch-Godfrey Serial Correlation LM Test to investigate serial correlation, which helps to identify the relationship that may exist between the current value of the regression residuals and lagged values. The null-hypothesis of the LM test that the residuals are not serially correlated is accepted at 5% level of significance as shown in below table.

Furthermore, Durbin-Watson test is use to test autocorrelation among the data (error term). In Durbin-Watson test, null hypothesis indicate that autocorrelation does not exist in error term and alternative hypothesis depicts that autocorrelation exist in error term. Since regression model has assumption of uncorrelated error term therefore it must be fulfilled to run regression analysis. In Table 4.5 indicate value of Durbin-watson as 1.85which shows that autocorrelation does not exist in error term.

Table 4.6: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.181556	Prob. F(2,71)	0.3128
Obs*R-squared	2.576893	Prob. Chi-Square(2)	0.2757

Source : Own Computation (2018)

4.6.3. Heteroscedasticity

Breusch-Pagan-Godfrey's test tests the null hypothesis that the variance of the residual is homoscedasticity; this can be true if and only if the p-value is greater than 0.05 this indicates that we would have to not rejecting the null hypothesis of no heteroscedasticity problem. As it is presented in the table below the test results of Breusch-Pagan-Godfrey is statistically

insignificant, this implies that the regression of the residuals on the predicted values in significant heteroscedasticity because it's corresponding p- value is strongly greater than 0.05.

Table 4.7: Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey

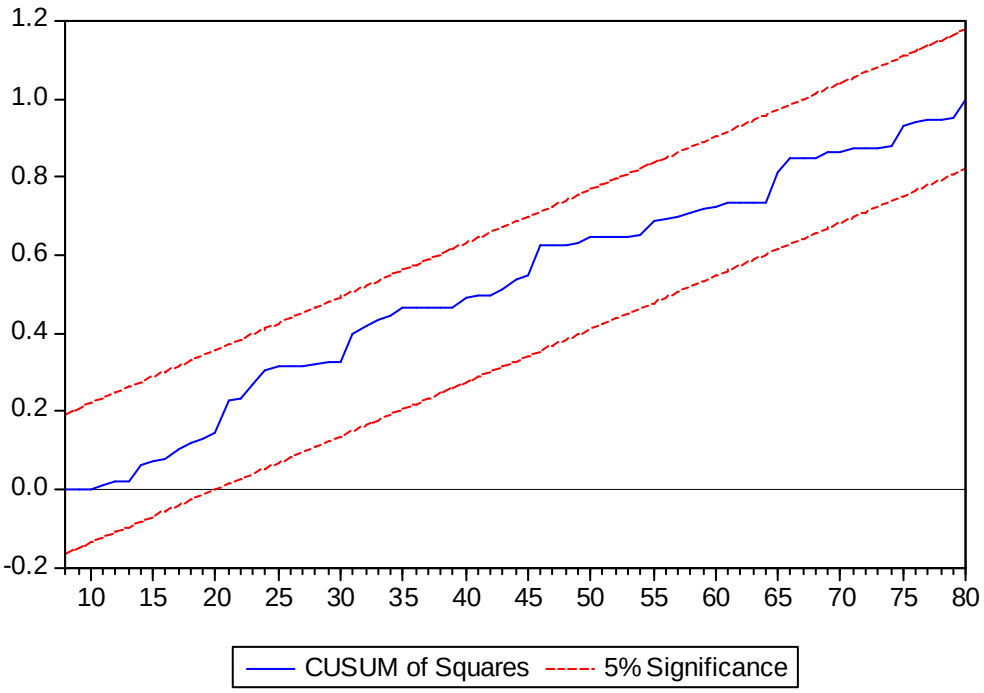
F-statistic	2.038119	Prob. F(7,72)	0.0617
Obs*R-squared	13.23042	Prob. Chi-Square(7)	0.0667

Source: Own
Computation(2018)

4.6.4. Stability Tests

Also, in order to strength our analysis, the stability of the estimated parameters in the model is examined using stability test of Recursive residuals. The stability of the model is checked using CUMSUMSQURE methods and Therefore, according to the above figure, the CUSUM Squares plot bounds within the plus and minus 2 standard errors, and the CUSUM plots bounds within the plus and minus 5 standard errors. the graphs that show the results are presented as follows. The following figure affirms that the coefficients of the model are stable over a sample interval.

Figure 4.7: Stability Tests



Source: Own drawing (2018)

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusions

This study investigates the role of Private Commercial Banks on Economic Growth of Ethiopia, and their direction of causality. The data used in this study is panel data, which were collected from the period of 2008 to 2017 from audited financial statements of Private commercial banks, NBE, MoFEC, CSA data base statistics.

For investigation purpose the study has used asset, branch network, capital, deposit, labor force, loan & advance and profit are selected as explanatory variable while RGDP is taken as dependent variable. For this study, Levin, Lin & Chu t* unit root test, granger causality test and Co integration test were used.

Therefore, Levin, Lin & Chu t* unit root test confirms certain variables were non-stationary at level and all variables became stationary at first difference. Co-integration test confirms long term association between variables.

This study indicated that profit, loan and advance, and labor have positive and significant impact On RGDP whereas, branch network has negative relationship and significant impact with RGDP. On the other hand asset has positive and insignificant relationship with RGDP. The other finding in this study indicated that deposit and capital have negative relationship and insignificant impact with RGDP.

After applying the causality test we found the bidirectional causal relationship of branch network with economic growth and unidirectional causal relationship with loan and advances, profits and labor force whereas asset and deposit were no causal relationship with economic growth.

5.2. Recommendations

Based on the findings of this research which have been above stated and implications emanating there from, the researcher therefore offers the following matching recommendations put down hereunder for urgent policy action.

As per the findings of the study, labor force and profit of private commercial banks have found positive and significant association with economic growth. Following this, the researcher recommends that adequate efforts be made by private commercial banks to increase their level of skilled man power and level of profitability as that will help in increasing economic growth of a country.

Regarding a variable loan and advances it is positively affect the GDP and has significant impact. Therefore, in order to meet the financial needs of economic units, private commercial banks should develop well organized credit procedures, policies and analytical capabilities and flexible NBE.

It is recommended that the policy makers should make policies to enhance the banking sector in Ethiopia because banking sector is significantly contributing in the economic growth of Ethiopia.

The study found that the unidirectional causality running from profit, and loan to RGPD. Hence, the study recommends that the bank managers, board of directors and NBE or government should focus on in optimizing these indicators.

The study also found bidirectional causality between branch network and RGDP. Hence, the study recommends that private commercial banks should have to minimizing costs during opening new branches and they should also efficiently use the resources.

Finally, this research found negative relationship between capital and deposit with economic growth (RGDP) hence further research has to be undertaken in order to see again the effect of the relationship between capital of private commercial banks and economic growth.

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List of appendices

Appendix1: Unit Root Test

Null Hypothesis: Unit root (common unit root process)
Series: D(LNASSE)
Date: 12/18/18 Time: 14:19
Sample: 1 80
Exogenous variables: Individual effects, individual linear trends
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 56
Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-2.14229	0.0161

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNASSE)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-1.47674	0.0003	0.0001	1	1	7.0	7
2	-0.61895	4.E-05	6.E-05	1	1	1.0	7
3	-2.23874	0.0001	0.0004	1	1	2.0	7
4	-2.61960	0.0003	0.0006	1	1	3.0	7
5	-0.88395	0.0003	9.E-05	1	1	7.0	7
6	-1.05419	0.0002	6.E-05	1	1	7.0	7
7	-3.08853	0.0007	0.0008	1	1	7.0	7
8	-1.64524	0.0013	0.0005	1	1	7.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-1.54144	-7.840	1.186	-0.703	1.003	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNBRAN)

Date: 12/18/18 Time: 14:21

Sample: 1 80

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-8.1356	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNBRAN)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-1.20083	0.0006	0.0006	1	1	3.0	7
2	-1.86719	0.0010	0.0004	1	1	6.0	7
3	-1.60449	0.0007	0.0011	1	1	1.0	7
4	-1.53929	0.0003	0.0003	1	1	7.0	7
5	-2.48282	0.0006	0.0006	1	1	5.0	7
6	-1.45303	0.0003	9.E-05	1	1	7.0	7
7	-1.95490	0.0002	0.0004	1	1	6.0	7
8	-2.25740	0.0003	0.0002	1	1	7.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-1.86926	-13.169	1.049	-0.703	1.003	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNCAPI)

Date: 12/18/18 Time: 14:22

Sample: 1 80

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-10.7616	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNCAPI)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-2.37748	0.0004	0.0006	1	1	4.0	7
2	-2.41868	0.0003	0.0001	1	1	7.0	7
3	-0.84345	0.0013	0.0003	1	1	7.0	7
4	-0.68910	0.0002	0.0001	1	1	1.0	7
5	-2.47289	0.0002	0.0010	1	1	5.0	7
6	-1.69785	0.0001	0.0002	1	1	4.0	7
7	-0.59072	0.0020	0.0005	1	1	7.0	7
8	-2.25257	0.0014	0.0008	1	1	7.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-2.04822	-14.436	1.274	-0.703	1.003	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNDEPO)

Date: 12/18/18 Time: 14:23

Sample: 1 80

Exogenous variables: None

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-3.38754	0.0004

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNDEPO)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-1.35022	0.1089	0.1107	1	1	0.0	7
2	-2.62802	0.0912	0.1101	1	1	0.0	7
3	-1.91926	0.0657	0.0737	1	1	1.0	7
4	-1.34049	0.0557	0.0684	1	1	0.0	7
5	-1.93594	0.3873	0.2758	1	1	3.0	7
6	-1.60332	0.0570	0.0690	1	1	0.0	7
7	-0.41175	0.0387	0.0393	1	1	0.0	7
8	-0.55984	0.0256	0.0326	1	1	2.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-0.94119	-3.497	1.055	0.004	1.049	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNEXPO)

Date: 12/18/18 Time: 14:25

Sample: 1 80

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-4.24563	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNEXPO)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-0.56940	0.0009	0.0028	1	1	4.0	7
2	-0.56940	0.0009	0.0028	1	1	4.0	7
3	-0.56940	0.0009	0.0028	1	1	4.0	7
4	-0.56940	0.0009	0.0028	1	1	4.0	7
5	-0.56940	0.0009	0.0028	1	1	4.0	7
6	-0.56940	0.0009	0.0028	1	1	4.0	7
7	-0.56940	0.0009	0.0028	1	1	4.0	7

8	-0.56940	0.0009	0.0028	1	1	4.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-0.56940	-7.832	1.000	-0.554	0.919	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNFOREIG)

Date: 12/18/18 Time: 14:26

Sample: 1 80

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-9.15582	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNFOREIG)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-1.58799	0.0173	0.0043	1	1	7.0	7

2	-1.55756	0.0253	0.0076	1	1	7.0	7
3	-2.33236	0.0067	0.0045	1	1	5.0	7
4	-1.89939	0.0152	0.0050	1	1	7.0	7
5	-2.50127	0.0020	0.0062	1	1	6.0	7
6	-1.18283	0.0129	0.0085	1	1	7.0	7
7	-1.53530	0.1020	0.2270	1	1	6.0	7
8	-2.33028	0.0222	0.0608	1	1	7.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-1.79376	-13.223	1.162	-0.703	1.003	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNINF)

Date: 12/18/18 Time: 14:26

Sample: 1 80

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-25.7159	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNINF)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-2.22841	0.0185	0.0841	1	1	5.0	7
2	-2.22841	0.0185	0.0841	1	1	5.0	7
3	-2.22841	0.0185	0.0841	1	1	5.0	7
4	-2.22841	0.0185	0.0841	1	1	5.0	7
5	-2.22841	0.0185	0.0841	1	1	5.0	7
6	-2.22841	0.0185	0.0841	1	1	5.0	7
7	-2.22841	0.0185	0.0841	1	1	5.0	7
8	-2.22841	0.0185	0.0841	1	1	5.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-2.22841	-31.692	1.000	-0.703	1.003	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNLAB)

Date: 12/25/18 Time: 00:47

Sample: 1 80

Exogenous variables: Individual effects,

individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statisti	Prob.*

	c	*
Levin, Lin & Chu t*	-3.91364	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNLAB)

Cross Section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-2.07302	0.0007	0.0014	1	1	0.0	7
2	-2.07302	0.0007	0.0014	1	1	0.0	7
3	-2.07302	0.0007	0.0014	1	1	0.0	7
4	-2.07302	0.0007	0.0014	1	1	0.0	7
5	-2.07302	0.0007	0.0014	1	1	0.0	7
6	-2.07302	0.0007	0.0014	1	1	0.0	7
7	-2.07302	0.0007	0.0014	1	1	0.0	7
8	-2.07302	0.0007	0.0014	1	1	0.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-2.07302	-3.934	1.000	0.004	1.049	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNLOAN)

Date: 12/18/18 Time: 14:27

Sample: 1 80

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-3.49833	0.0002

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNLOAN)

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-0.85712	0.0158	0.0103	1	1	3.0	7
2	-2.51671	0.0032	0.0022	1	1	5.0	7
3	-0.80289	0.0095	0.0058	1	1	7.0	7
4	-2.02198	0.0048	0.0091	1	1	2.0	7
5	-0.80910	0.0042	0.0012	1	1	7.0	7
6	-2.26490	0.0027	0.0029	1	1	7.0	7
7	-2.26724	0.0196	0.0138	1	1	6.0	7
8	-1.98666	0.0143	0.0106	1	1	7.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-1.54504	-8.265	1.168	-0.703	1.003	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNPROF)

Date: 12/18/18 Time: 14:29

Sample: 1 80

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-3.91836	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNPROF)

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-0.87691	1.E-05	3.E-06	1	1	7.0	7
2	-0.87691	1.E-05	3.E-06	1	1	7.0	7
3	-0.87691	1.E-05	3.E-06	1	1	7.0	7
4	-0.87691	1.E-05	3.E-06	1	1	7.0	7
5	-0.87691	1.E-05	3.E-06	1	1	7.0	7
6	-0.87691	1.E-05	3.E-06	1	1	7.0	7
7	-0.87691	1.E-05	3.E-06	1	1	7.0	7
8	-0.87691	1.E-05	3.E-06	1	1	7.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-0.87691	-6.460	1.000	-0.703	1.003	56

Null Hypothesis: Unit root (common unit root process)

Series: D(LNRGDP)

Date: 12/18/18 Time: 14:29

Sample: 1 80

Exogenous variables: Individual effects, individual linear trends

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 56

Cross-sections included: 8

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-1.74535	0.0405

** Probabilities are computed assuming asympotic normality

Intermediate results on D(LNRGDP)

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
1	-5.62589	0.0051	0.0053	1	1	4.0	7
2	-1.66416	0.0269	0.0102	1	1	6.0	7
3	-1.66416	0.0269	0.0102	1	1	6.0	7
4	-1.66416	0.0269	0.0102	1	1	6.0	7

5	-1.66416	0.0269	0.0102	1	1	6.0	7
6	-1.66416	0.0269	0.0102	1	1	6.0	7
7	-1.66416	0.0269	0.0102	1	1	6.0	7
8	-1.66416	0.0269	0.0102	1	1	6.0	7

	Coefficient	t-Stat	SE Reg	mu*	sig*	Obs
Pooled	-1.66995	-7.527	1.004	-0.703	1.003	56

Appendix 2: Panel Co integration Test

Kao Residual Cointegration Test

Series: LNRGDP LNASSE LNBRAN LNCAPI LNDEPO LNEXPO LNFOREIG LNINF LNLAB LNLOAN LNPROF

Date: 12/18/18 Time: 14:31

Sample: 1 80

Included observations: 80

Null Hypothesis: No cointegration

Trend assumption: No deterministic trend

User-specified lag length: 1

Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-3.488506	0.0002
Residual variance	0.010975	
HAC variance	0.008600	

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RESID)

Method: Least Squares

Date: 12/18/18 Time: 14:31

Sample: 1 80

Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.693358	0.147410	-4.703591	0.0000
D(RESID(-1))	-0.057772	0.111860	-0.516468	0.6074

R-squared	0.410717	Mean dependent var	0.003331
Adjusted R-squared	0.401213	S.D. dependent var	0.102728
S.E. of regression	0.079492	Akaike info criterion	-2.195560
Sum squared resid	0.391780	Schwarz criterion	-2.128095
Log likelihood	72.25793	Hannan-Quinn criter.	-2.168982
Durbin-Watson stat	2.343017		

Appendix3: Granger Causality Test

Pairwise Granger Causality Tests

Date: 12/18/18 Time: 14:35

Sample: 1 80

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LNBRAN does not Granger Cause LNASSE	64	3.87740	0.0262
LNASSE does not Granger Cause LNBRAN		2.49166	0.0914
LNCAPI does not Granger Cause LNASSE	64	1.58105	0.2144
LNASSE does not Granger Cause LNCAPI		3.65281	0.0319

LNDEPO does not Granger Cause LNASSE	64	0.04089	0.9600
LNASSE does not Granger Cause LNDEPO		3.89422	0.0258
LNEXPO does not Granger Cause LNASSE	64	0.64035	0.5307
LNASSE does not Granger Cause LNEXPO		0.13859	0.8709
LNFOREIG does not Granger Cause LNASSE	64	4.41432	0.0163
LNASSE does not Granger Cause LNFOREIG		4.12747	0.0210
LNINF does not Granger Cause LNASSE	64	0.36145	0.6982
LNASSE does not Granger Cause LNINF		5.69289	0.0055
LNLAB does not Granger Cause LNASSE	64	1.13085	0.3297
LNASSE does not Granger Cause LNLAB		2.56595	0.0854
LNLOAN does not Granger Cause LNASSE	64	1.49957	0.2316
LNASSE does not Granger Cause LNLOAN		10.3642	0.0001
LNPROF does not Granger Cause LNASSE	64	1.35587	0.2656
LNASSE does not Granger Cause LNPROF		1.01405	0.3690
LNRGDP does not Granger Cause LNASSE	64	1.59385	0.2118
LNASSE does not Granger Cause LNRGDP		1.08829	0.3435
LNCAPI does not Granger Cause LNBRAN	64	1.70670	0.1903
LNBRAN does not Granger Cause LNCAPI		4.14628	0.0207
LNDEPO does not Granger Cause LNBRAN	64	2.53004	0.0883
LNBRAN does not Granger Cause LNDEPO		0.99589	0.3755
LNEXPO does not Granger Cause LNBRAN	64	11.5387	6.E-05
LNBRAN does not Granger Cause LNEXPO		0.16085	0.8518

LNFOREIG does not Granger Cause LNBRAN	64	2.81773	0.0678
LNBRAN does not Granger Cause LNFOREIG		2.14945	0.1256
LNINF does not Granger Cause LNBRAN	64	0.25306	0.7773
LNBRAN does not Granger Cause LNINF		36.8646	4.E-11
LNLAB does not Granger Cause LNBRAN	64	17.5945	1.E-06
LNBRAN does not Granger Cause LNLAB		0.31054	0.7342
LNLOAN does not Granger Cause LNBRAN	64	4.32026	0.0177
LNBRAN does not Granger Cause LNLOAN		13.6020	1.E-05
LNPROF does not Granger Cause LNBRAN	64	18.4806	6.E-07
LNBRAN does not Granger Cause LNPROF		0.54669	0.5818
LNRGDP does not Granger Cause LNBRAN	64	10.7346	0.0001
LNBRAN does not Granger Cause LNRGDP		3.31171	0.0433
LNDEPO does not Granger Cause LNCAPI	64	3.67340	0.0314
LNCAPI does not Granger Cause LNDEPO		1.63228	0.2042
LNEXPO does not Granger Cause LNCAPI	64	0.98543	0.3793
LNCAPI does not Granger Cause LNEXPO		0.02497	0.9753
LNFOREIG does not Granger Cause LNCAPI	64	4.81012	0.0116
LNCAPI does not Granger Cause LNFOREIG		2.07140	0.1351
LNINF does not Granger Cause LNCAPI	64	3.96829	0.0242
LNCAPI does not Granger Cause LNINF		9.68799	0.0002
LNLAB does not Granger Cause LNCAPI	64	0.44063	0.6457

LNCAPI does not Granger Cause LNLAB		0.18729	0.8297
LNLOAN does not Granger Cause LNCAPI	64	0.15503	0.8567
LNCAPI does not Granger Cause LNLOAN		11.0892	8.E-05
LNPROF does not Granger Cause LNCAPI	64	0.51839	0.5982
LNCAPI does not Granger Cause LNPROF		1.91807	0.1559
LNRGDP does not Granger Cause LNCAPI	64	1.03153	0.3628
LNCAPI does not Granger Cause LNRGDP		2.55541	0.0862
LNEXPO does not Granger Cause LNDEPO	64	0.35973	0.6994
LNDEPO does not Granger Cause LNEXPO		2.31501	0.1077
LNFOREIG does not Granger Cause LNDEPO	64	0.60633	0.5487
LNDEPO does not Granger Cause LNFOREIG		3.16391	0.0495
LNINF does not Granger Cause LNDEPO	64	0.05315	0.9483
LNDEPO does not Granger Cause LNINF		3.91249	0.0254
LNLAB does not Granger Cause LNDEPO	64	14.5574	7.E-06
LNDEPO does not Granger Cause LNLAB		0.38681	0.6809
LNLOAN does not Granger Cause LNDEPO	64	0.22410	0.7999
LNDEPO does not Granger Cause LNLOAN		6.56472	0.0027
LNPROF does not Granger Cause LNDEPO	64	0.59478	0.5550
LNDEPO does not Granger Cause LNPROF		0.73414	0.4842
LNRGDP does not Granger Cause LNDEPO	64	0.44124	0.6453
LNDEPO does not Granger Cause LNRGDP		1.26810	0.2889
LNFOREIG does not Granger Cause LNEXPO	64	0.11404	0.8924

LNEXPO does not Granger Cause LNFOREIG		0.52614	0.5936
LNINF does not Granger Cause LNEXPO	64	20.5935	2.E-07
LNEXPO does not Granger Cause LNINF		212.212	1.E-27
LNLAB does not Granger Cause LNEXPO	64	0.07841	0.9247
LNEXPO does not Granger Cause LNLAB		8.83807	0.0004
LNLOAN does not Granger Cause LNEXPO	64	0.29933	0.7424
LNEXPO does not Granger Cause LNLOAN		1.42696	0.2482
LNPROF does not Granger Cause LNEXPO	64	0.06640	0.9358
LNEXPO does not Granger Cause LNPROF		147.020	1.E-23
LNRGDP does not Granger Cause LNEXPO	64	4.02216	0.0230
LNEXPO does not Granger Cause LNRGDP		7.43565	0.0013
LNINF does not Granger Cause LNFOREIG	64	1.56354	0.2179
LNFOREIG does not Granger Cause LNINF		0.68218	0.5095
LNLAB does not Granger Cause LNFOREIG	64	0.36875	0.6932
LNFOREIG does not Granger Cause LNLAB		0.01238	0.9877
LNLOAN does not Granger Cause LNFOREIG	64	9.27908	0.0003
LNFOREIG does not Granger Cause LNLOAN		1.30229	0.2796
LNPROF does not Granger Cause LNFOREIG	64	0.35993	0.6992
LNFOREIG does not Granger Cause LNPROF		0.08914	0.9148
LNRGDP does not Granger Cause LNFOREIG	64	0.44412	0.6435

LNFOREIG does not Granger Cause LNRGDP		0.81480	0.4476
LNLAB does not Granger Cause LNINF	64	45.0266	1.E-12
LNINF does not Granger Cause LNLAB		2.83780	0.0666
LNLOAN does not Granger Cause LNINF	64	1.47394	0.2373
LNINF does not Granger Cause LNLOAN		6.93280	0.0020
LNPROF does not Granger Cause LNINF	64	191.853	2.E-26
LNINF does not Granger Cause LNPROF		4.82029	0.0115
LNRGDP does not Granger Cause LNINF	64	43.9741	2.E-12
LNINF does not Granger Cause LNRGDP		27.0494	5.E-09
LNLOAN does not Granger Cause LNLAB	64	4.70653	0.0127
LNLAB does not Granger Cause LNLOAN		10.4395	0.0001
LNPROF does not Granger Cause LNLAB	64	171.882	2.E-25
LNLAB does not Granger Cause LNPROF		200.479	5.E-27
LNRGDP does not Granger Cause LNLAB	64	2.21057	0.1186
LNLAB does not Granger Cause LNRGDP		18.4184	6.E-07
LNPROF does not Granger Cause LNLOAN	64	8.29735	0.0007
LNLOAN does not Granger Cause LNPROF		2.07872	0.1342
LNRGDP does not Granger Cause LNLOAN	64	6.24657	0.0035
LNLOAN does not Granger Cause LNRGDP		1.02386	0.3655
LNRGDP does not Granger Cause LNPROF	64	0.13538	0.8737
LNPROF does not Granger Cause LNRGDP		9.57161	0.0003

Appendix 4: Random Effect models

lnrgdp lnasse lnbran lncapi lndepo lnlab lnloan lnprof

Dependent Variable: LNRGDP

Method: Panel EGLS (Cross-section random effects)

Date: 12/18/18 Time: 15:10

Sample: 1 80

Periods included: 10

Cross-sections included: 8

Total panel (balanced) observations: 80

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-25.88140	4.898576	-5.283455	0.0000
LNASSE	0.228605	0.154779	1.476971	0.1440
LNBRAN	-0.351106	0.190690	-1.841243	0.0697
LNCAPI	-0.115646	0.139935	-0.826426	0.4113
LNDEPO	-0.083901	0.073416	-1.142819	0.2569
LNLAB	1.899061	0.639712	2.968619	0.0041
LNLOAN	0.127817	0.074426	1.717363	0.0902
LNPROF	12.63761	1.244107	10.15797	0.0000

Effects Specification		
	S.D.	Rho
Cross-section random	0.033706	0.1033
Idiosyncratic random	0.099300	0.8967

Weighted Statistics			
R-squared	0.927548	Mean dependent var	1.763678
Adjusted R-squared	0.920504	S.D. dependent var	0.372615
S.E. of regression	0.105059	Sum squared resid	0.794688
F-statistic	131.6806	Durbin-Watson stat	1.518259

Prob(F-statistic)	0.000000

Un weighted Statistics			
R-squared	0.915969	Mean dependent var	2.587367
Sum squared resid	0.929719	Durbin-Watson stat	1.297748

Appendix 5: Hausman Tests

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.593674	7	0.0589

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LNASSE	0.243795	0.228605	0.005542	0.8383
LNBRAN	-0.591292	-0.351106	0.011900	0.0277
LNCAPI	-0.287779	-0.115646	0.034562	0.3545
LNDEPO	-0.061702	-0.083901	0.000378	0.2535
LNLAB	2.709869	1.899061	0.091062	0.0072
LNLOAN	0.114736	0.127817	0.000553	0.5782
LNPROF	15.203239	12.637607	1.314887	0.0253

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.181556	Prob. F(2,71)	0.3128
Obs*R-squared	2.576893	Prob. Chi-Square(2)	0.2757

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 01/05/19 Time: 15:10
Sample: 1 80
Included observations: 80
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNASSE	-0.005697	0.179687	-0.031708	0.9748
LNCAPI	-0.004564	0.145356	-0.031399	0.9750
LNDEPO	-0.008112	0.071757	-0.113054	0.9103
LNLAB	0.038027	0.187052	0.203297	0.8395
LNLOAN	0.009828	0.092453	0.106308	0.9156
LNPROF	-0.314867	1.484012	-0.212173	0.8326
LNBRAN	0.033284	0.162464	0.204872	0.8383
RESID(-1)	0.168832	0.126556	1.334048	0.1865
RESID(-2)	0.064611	0.127671	0.506076	0.6144

R-squared	0.032210	Mean dependent var	-0.000128
Adjusted R-squared	-0.076837	S.D. dependent var	0.120142
S.E. of regression	0.124672	Akaike info criterion	-1.220606
Sum squared resid	1.103563	Schwarz criterion	-0.952628
Log likelihood	57.82422	Hannan-Quinn criter.	-1.113165

Durbin-Watson stat	1.932362

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.038119	Prob. F(7,72)	0.0617
Obs*R-squared	13.23042	Prob. Chi-Square(7)	0.0667

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 01/05/19 Time: 15:12

Sample: 1 80

Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.249492	1.090643	1.145648	0.2557
LNASSE	0.077395	0.033684	2.297657	0.0245
LNCAPI	-0.050623	0.027613	-1.833299	0.0709
LNDEPO	-0.043029	0.016912	-2.544240	0.0131
LNLAB	-0.211670	0.144957	-1.460227	0.1486
LNLOAN	0.031366	0.017339	1.808968	0.0746
LNPROF	0.388666	0.275878	1.408833	0.1632

LNBRAN	-0.028971	0.040680	-0.712175	0.4787

R-squared	0.165380	Mean dependent var	0.014254
Adjusted R-squared	0.084237	S.D. dependent var	0.024425
S.E. of regression	0.023374	Akaike info criterion	-4.579748
Sum squared resid	0.039337	Schwarz criterion	-4.341546
Log likelihood	191.1899	Hannan-Quinn criter.	-4.484246
F-statistic	2.038119	Durbin-Watson stat	0.978535
Prob(F-statistic)	0.061733		