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Macroeconomic determinants of commercial Banks' profitability in Ethiopia

A thesis submitted to The Department of project management for Partial Fulfilment of the Requirement of Degree of Master of Business Administration in project management

By: - Selamawit Hailu Bekele

Advisor: - Asmamaw Getie (Ass.prof)

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Statement of Declaration

I, Selamawit Hailu Bekele, hereby declare that this thesis entitled "Macroeconomic determinants of commercial Banks' profitability in Ethiopia" submitted by me for the award of the degree of Master of MBA in project management, Saint Mary University at Addis Ababa, Ethiopia, is my original work and it has never been presented in any university. All sources and materials used for this thesis have been duly acknowledged.

Name: SelamawitHailu Bekele

Signature: _____

Place: Addis Ababa

Date of Submission: January, 2018

This master thesis has been submitted for examination with my approval as thesis.

Advisor: Asmamaw Getie (Ass.prof)

Signature_____

Date _____

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This is to certify that the thesis entitled, "Macroeconomic determinants of commercial Banks' profitability in Ethiopia"was carried out by Selamawit Hailu Bekele under the supervision of Ato Asmamaw Getie (Ass.prof) and submitted in Partial Fulfilment of the Requirement for Master of Business Administration (MBA) in project management complies with the regulation of the university and meets the accepted standards with respect to originality and quality.

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Internal examiner: - <u>Zinegnaw Abiy (PhD)</u> Signature _____Date _____

External examiner<u>: Arega Seyoum (PhD)</u> Signature <u>_____</u>Date _____

Advisor:-<u>Asmamaw Getie(Asst.prof)</u> Signature _____Date _____

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List of Acronyms & Abbreviation

CLRM   Classical linear regression model

EXCH   Exchange rate

GDP   growth domestic product

INFL   inflation rate

LIR   Lending interest rate

M2   Broad money supply

MP   Market power

MOFEC   Ministry of finance and Economic Cooperation

NBE   National Bank of Ethiopia

ROA   Return on Asset

ROE   Return on Equity

ABSTRACT

This study determines the effect of macroeconomic factors on profitability of commercial banks in Ethiopia. The Profitability measure of commercial banks used was the Return on Asset (ROA) which was regressed against the macroeconomic variables including GDP growth rate, the exchange rate (US dollar), Inflation (CPI), financial deepening and average Lending Rate of the commercial banks. The period of the study was fifteen years from 2002 to June 2016. The study employed annual secondary data which was obtained from the national bank of Ethiopia. Ministry of Finance and Economic Cooperation and annual audited financial statements from commercial banks selected in the sample. Data was analyzed using Pooled Least Square Method which assumes linearity between the dependent variable and the independent variables and the analysis technique was multiple regressions aided by research software 'eviews' version 8. The profitability of commercial banks as measured by ROA was found to be positively related with GDP growth rate, lending interest rate of average commercial banks, inflation, financial deepening (M2/GDP) and with exchange rate. But the finding show insignificant relationship between exchange rate and commercial banks profitability. The study suggests that focusing and giving more attention for macroeconomic factors could enhance the profitability as well as the performance of the commercial banks in Ethiopia.

Keyword: Macroeconomic determinants and profitability

CHAPTER ONE

INTRODUTION

1.1 Background of the study

The banking system plays a major role in transferring funds from the saving units to the investing units. If a financial system is efficient, it should show improvements in profitability, increasing the volume of funds flowing from saver to borrowers, and better quality services for consumers. The financial intermediation provided by the banking sector supports economic acceleration by converting deposits into productive investments (Levine et al., 2000).

In most countries, banks provide essential financial services that facilitate economic growth. The banking sector acts as the life blood of modern economy being a major source of finance. The concept of profitability is important for banks because they largely depend on competitive marketing strategy that determines their success and growth. Bank performance has been one of the main concerns of management experts, investors, and economic analysts. This concern closely relates to the relationship between the banks performance and economic growth. Due to this, the protocols of the banking business have changed a lot in the new millennium compared to the way they used to be in the years by gone (Hussain and Bhatti 2010).

Bank performance gets a great deal of attention in the finance literature considering that banks serve a pivotal role in the economy. The performance of banks is expressed in various terms, such as competition, concentration, efficiency, productivity, and profitability. Firms with better performance are better able to resist negative shocks and contribute to the stability of the financial system (Athanasoglou et al 2008). The profitability of the banking system has been one of the hot issues in financial environment. Since the bank industry play a major role in the financial system of the country and it supports the competitiveness of the financial institution.

The importance of financial sector in the development of the overall economy of country cannot be underestimated because the banking sector dominates the economic development of a country by mobilizing the savings of general people and channelling those saving towards investment and economic development and growth.

Therefore, profitability of the banking sector has direct impact on overall development and growth of economy. Profitability is one of the important pointers of industry performance that has major insinuation on sector's activities. Knowledge of the factors that influence the financial sector's profitability is therefore essential not only for the managers of the banks, but also for numerous stakeholders such as the central banks, bankers associations, governments, and other financial authorities. Knowledge of these factors would be useful in helping the regulatory authorities and bank managers formulate future policies aimed at improving the profitability of the banking sector (Sologoub.2006).

Theoretically determinant of bank profitability categorized into two internal and external, internal factors are bank specific   individual risk exposure, operating strategies, and the degree of management expertise and the external factor are industry specific and macro factors. Macro factors include GDP growth, inflation, unemployment, interest rate, exchange rate and the level of competition (Kosmidou1(2008), Sufian and Chong(2008).

In this first chapter statement of the problem, general and specific objectives of the study, research hypothesis formulation, significance of the study and scope and limitations of the study are discussed in detail. This study aims to fill the existing empirical research gap by analyzing the relationship between macroeconomic variables and commercial banks profitability measured by return on asset (ROA). This study will help the banks' management, existing shareholders, other stakeholders, policy makers of the country and those who want to conduct further study in this field.

1.1.2 Background of banking service in Ethiopia

Banking in Ethiopia began in 1905 with the Bank of Abyssinia, a private company controlled by the Bank of Egypt. In 1931 it was liquidated and replaced by the Bank of Ethiopia which operates until the Italian invasion of 1936. During the Italian occupation, Bank of Italy bank notes formed the legal tender. During the five years of the Italian occupation (1936-41), many branches of the Italian Banks such as Banco d'italia, Banco de-Roma, Banco Di-Napoli and Banco Nazianali del lavoro were operational in the main towns of Ethiopia (Alemayehu Geda, 2006).

After evacuation of Italians, the State Bank of Ethiopia was established on November 30, 1943 with a capital of one million Maria Theresa dollars. Pursuant to the Monetary and Banking Law of 1963 the State Bank of Ethiopia that had served as both a central and a commercial bank was dissolved and split into the National Bank of Ethiopia and Commercial Bank of Ethiopia Share Company. Accordingly, the central banking functions and the commercial banking activities were transferred to the National Bank of Ethiopia and the Commercial Bank of Ethiopia Share Company respectively. Under the subsequent British occupation, Ethiopia was briefly a part of the East Africa Currency Board. In 1943, the State Bank of Ethiopia was established, with two departments performing the separate functions of an issuing bank and a commercial bank. In 1963, these functions were formally separated and the National Bank of Ethiopia (the central and issuing bank) and the Commercial Bank of Ethiopia were formed (NBE, 2010).

During the era of state socialism (1974-1991), Ethiopia's financial institutions were charged with executing the national economic plan; state enterprises received bank finance in accordance with the plan's priorities.

This system based on the template of the Soviet Union, saw little need to develop the tools and techniques of financial systems (NBE, 2008). Following the change of Government in 1991 and the change of economic policy directions, financial institutions were re-organized to operate towards a market oriented policy framework. Proclamation No. 83/1994 which had allowed the establishment of private banks has marked the beginning of new era in the Ethiopian banking sector development. Commercial Banks both public and private are currently operational in line with Banking Proclamation No. 592/2008.

Following the enactment of the banking legislations in the country in the 1990s, a fairly good number of private banks have been established. Ethiopia aims to sustainably raise growth in line with its goal to reach middle income levels by 2025, while maintaining macroeconomic stability. The government's objectives are to sustain robust economic performance and single digit inflation.

To achieve these objectives, current policies promote high public investment supported partly by low nominal interest rates and a tight monetary policy (IMF, 2012). As per IMF, the objectives face vulnerabilities which are related to limited use of available monetary policy instruments (securities) to control inflation; low foreign reserve levels; a possible reinforcement of systemic risks associated with the dominant state-owned CBE and its

increasing exposure to public enterprises; large accumulation of debt by public enterprises; and crowding out of the private sector. To mitigate such vulnerabilities, maintaining financial sector stability; Keeping inflation under control to eliminate highly negative real interest rates and exchange rate overvaluation; creating space for an increased private sector's role in the economy; and achieving higher foreign reserve coverage were recommended (IMF, 2012). A proactive liquidity management (e.g., use of treasury bills) is also important to contain the risks of inflation resurging.

This would facilitate matching money supply to money demand, encourage the development of the money market, and through a response by the broader interest rate structure support domestic mobilization of resources by the financial sector. At the end of the fiscal year ended in June 2016, there are eighteen banks operating in Ethiopia, of these sixteen are private commercial banks while the rest two are state owned banks (NBE, 2016). The Ethiopian banking sector comprises 18 banks, including a dominant state-owned bank, CBE, whose assets represent about 70 percent of the sector total, as of April 2013 and the rest 16 banks, mainly private, together account for the remainder. The authorities" development strategy is based on directed lending mainly to public enterprises via CBE and, to some extent, government targeted private sector activities via the government-owned Development Bank of Ethiopia (DBE). This policy, combined with high inflation, and negative real interest rates, results in a significant transfer of resources from creditors (savers) to borrowers, especially the public sector. Regulation has also effect on commercial banks profitability (Capital, 2013). As cited in Capital (2013) the requirement on commercial banks to purchase NBE bills equivalent to 27 percent of any new loans appears to have a sizable negative impact on commercial banks" intermediation activities. The requirement also has the potential of creating maturity mismatches as the commercial banks collect savings at two to three-year maturity.

The directive requires private commercial banks to hold 27 percent of the gross loan extension (irrespective of the tenor) in a 5 year NBE bill at an interest rate of 3 percent per annum while deposit rates are around 5 percent) and even shorter in some cases, but have to freeze these resources for five years at rates lower than cost of funds. There is also a risk that as the profitability of commercial banks reduces on account of less intermediation because of this directive, they could raise noninterest income charges such as fees and commissions to recoup these losses, further impacting negatively on the private sector. However, banks are

currently reporting profit. Recent developments such as the increasingly dominant market share of CBE and its growing exposure to large public enterprises, and the impact of the 27 percent requirement on private banks, suggest a need for a closer scrutiny of the banking system.

It would be important to undertake a diagnostic of the sector to better assess potential vulnerabilities that might be building up even in the context of the ongoing implementation of measures in the sector. Government argues that 27 percent NBE bill requirement did not affect private banks and they remain overall highly profitable.

In Ethiopian context, the financial system is dominated by banking industry. The Ethiopian banking industry can be characterized as highly profitable, concentrated and moderately competitive. Competition in terms of price is relatively weak in the Ethiopian banking industry.

Banks in the Ethiopian case are competing in terms of service quality and efficiency (including use of technological advances), branch network expansions, advertising and prices, put in the order of their significance. Banks performances are governed largely by macroeconomic performances than competitive parameters as high (low) performances coincided with good (bad) macroeconomic conditions (Eshete, 2013).

1.2 statement of the problem

In order to survive in the long run identifying factors affecting profitability is important for banks, because it helps to take initiatives to increases profitability by managing the dominant determinants. Bank profitability is also vitally important for all stakeholders, such as the owners, the investors, the debtors, the creditors, and the depositors, the managers of banks, the regulators and the government. The profitability of banks gives directions to the stake holders in their decision making (Evans 2014).

Knowledge of determinants of bank profitability is important for banks and policy makers (Kosmidou1, 2008; Sufian and Chong, 2008).There are two commonly accepted categories of determinants of profitability of banking sector according to Khrawish (2011) categories of determinants of bank profitability are external and internal. The Internal determinants are

those variables that can be controlled by the management whereas the external determinants are those variables beyond the control of the management. The internal determinants include management controllable factors such as the level of deposit, the level of loans and advances, investment in securities, non-performing loans, non interest incomes, and overhead expenditure.

Similarly, external determinants include those factors which are beyond the control of management of the bank such as market share, market growth, market concentration, interest rates, inflation rates, and GDP growth and money supply. Macroeconomics determinants are the major component of the external profit determinants in most studies (Karkrah and Ameyaw 2010).

Macroeconomics factor tends to have impact on profitability of commercial banks in different ways. The ability of bank specific determinant to explain movements in bank risk and profit have been a focus by many researchers. Although researchers who are try to include the macroeconomics factors doesn't include more than one or two variables. The majority of previous studies made on this topic focused mainly on the internal dimension than the external one. However, the external determinants also deserve attention as the current economic growth of Ethiopia in particular and globalization in general creates opportunities and challenges (risks) for Ethiopian commercial banks. The external determinants of commercial banks profitability are factors which are uncontrollable by the banks management, but have an effect on bank's profitability.

The reason for focusing on macroeconomic factors (which covers monetary discipline such as inflation, exchange rate, GDP and interest rates) keep on changing and such frequent changes could affect banks overall profitability which, in turn, could give an impact to the general economy of Ethiopia.

In short, the determinants of profitability of the commercial banking sector might change if the macroeconomics changes as well (Alper and Anbar, 2011).

In addition, previous studies revealed that these macroeconomic factors have significantly contributed to the development of financial market in some countries such as Turkey Alper and Anbar(2011), Nigeria , Aburime(2008), Macao, Vong and Chan(2009).

The main purpose of this study was to analyse the financial data of Ethiopian commercial banks for the fiscal year from 2002 to 2016 in order to investigate the macroeconomics determinants of bank profitability. In addition, to examine the relationship among measures of macroeconomics variable such as inflation, interest rate , exchange rate , financial deepening, level of GDP and to discuss their impact on banks profitability which measured by Return on Asset (ROA) .

The banks are not only affected by the internal environment but also affected by the macroeconomic conditions of the country.

Thus it is of worth importance to measure the impact of the macroeconomic variables on the performance of the banks. This study therefore seeks to fill this research gap by answering the following question: How do macro-economic factors affect the profitability of commercial banks in Ethiopia?

1.3 objectives of the study

1.3.1 General Objective

The major objective of this study is to investigate the impact of macroeconomics factors on the profitability of commercial banks of Ethiopia.

1.3.2 Specific Objectives

- ➢ To determine effect of real gross domestic products (GDP) on commercial banks profitability.
- ➢ To examine the impact of inflation rate (INF) on commercial banks profitability.
- ➢ To evaluate the effect of exchange rate (EXC) on commercial banks profitability.
- ➢ To examine the impact of interest rate(LIR) on commercial banks profitability
- ➢ To examine the impact of financial deepening (M2/GDP) on profitability of commercial banks.

1.4 Research hypothesis

The aim of this study is to examine the impact of macroeconomics factors on commercial banks profitability.

Based on reviewed empirical studies which are done around the world on profitability of commercial banks, the researcher developed the following hypothesis to estimate the significance of the relationship between macroeconomic variables and bank profitability.

H1: GDP growth has positive significant relationship with profitability

H2: Inflation rate is positively associated with bank profitability.

H3: Average lending interest rate is positively related to bank profitability.

H4: Exchange rate is expected to have positive effect on profitability of commercial banks of Ethiopia.

H5: financial deepening is expected to have positive effect on profitability of commercial banks of Ethiopia

1.5 Significant of the study

This study be important for NBE the policy makers in Ethiopia to scholars and academicians, and will increase body of knowledge on the effect of macroeconomic variables on the performance of commercial banks in Ethiopia.

It will also suggest areas for further research so that future scholars can pick up these areas and study further. The study will be important to the government especially the Ministry of Finance and economy and the National Bank of Ethiopia for making policy decisions whose overall objectives is to influence the level of economic activity and ensure a stable banking sector.

1.6 Scope and limitation of the study

The study tried to investigate the profitability determinants of commercial banks in Ethiopia. It focuses only on the macroeconomics factors that determine the profitability of commercial banks in Ethiopia. As such it includes both the private and government owned commercial banks. However, the period is from 2001/2002 to 2015/ 2016.

This study emphasizes on secondary data that is restricted to information obtainable from the yearly financial statement of banks and annual report of MOFEC and NBE. The number of years for which data was used is limited due to availability of data. And to be more accurate on financial data the researcher used audited financial statement obtained from NBE.

1.7 organization of the paper

The paper has five chapters. The first chapter contains background of the study, statement of the problem, objectives, hypotheses, significance, and scope and limitations of the study. Chapter two focuses on literature review of important concepts that are relevant to the study. The third chapter discuss the methodologies, which include data source, sampling method and sampling size, data collection instrument, data analysis method and research variables in the study. The fourth chapter discusses about the empirical findings of the study. The Fifth chapter presents conclusion and recommendation of the study based on the finding.

CHAPTER TWO

REVIEW OF RELATED LITERATURES

2.1 Introduction

This section draws on literature in the area of macroeconomic factors and the profitability of the banking sector. The chapter reviews literature by other scholars especially studies touching on macroeconomic variables and the profitability of banking sectors. The chapter addresses history of banking in Ethiopia, the theoretical framework on which the study is build and then presents empirical review of literature on the profitability of commercial banks.

2.2 Theoretical review
2.2.1 Market-Power Hypotheses

A more organized study of bank performance started in the late 1980's (Olweny and Shipho, 2011) with the application of Market Power (MP) and Efficiency Structure (ES) theories (Athanasoglou et al, 2005.) The MP theory states that increased external market forces results into profit. Moreover, the hypothesis suggest that only firms with large market share and well differentiated portfolio (product) can win their competitors and earn monopolistic profit. The market power hypothesis asserts that increased market power yields monopoly profits. A special case of the MP hypothesis is the Relative-Market-Power (RMP) hypothesis; this suggests that if a bank intends to increase its profits by increasing leverage, the equity to asset ratio (capital) has to be reduced.

Other theories that suggest the determinants of bank profitability are the Market Power and Efficiency Structure theories. Market Power suggests that performance of banks is determined by market structure of the industry. The Efficiency Theory argues that banks earn more profits because they are more efficient in their operations than their competitors (OLweny and Shipo, 2011), which leads to low operational costs and high profits (Zouari, 2010).

From the literature, the determinants of bank profitability are divided into two: those which can be controlled by the management, and those which are beyond the control of bank management.

The factors that can be controlled by the management are called internal factors while those outside their control are called external factors. The internal determinants of bank profitability reflect the banks` management policies and decisions made on sources and uses of funds, capital, liquidity management and expenses management.

This information is usually available on the bank`s balance sheet and in the profit and loss accounts. According to Nassredin (2013), the external determinants of bank profits are related to both the economic and legal environment in which the banks operate. The environmental factors include market structure, regulation, inflation, interest rates, market growth, and the general economic conditions such as economic booms or recessions (Short 1979, Bourke 1989, Molyneux and Thornton, 1992).

2.2.2 Modern monetary theory (MMT)

Modern monetary theory explains exclusively how the government, central bank and the commercial banking sector interacts, with some economists arguing that understanding of reserve accounting is critical to understanding monetary policy options. This theory was developed by a group of economist including Randal Wray (2009). All of the commercial banks will also have an account with the central bank.

This permits the banks to manage their reserves that is, the amount of available short-term money that a particular bank holds. So when the government spends, treasury will debit its cash operating account at the central bank, and deposit this money into private bank accounts (and hence into the commercial banking system). This money adds to the total reserves of the commercial bank sector. MMT argues that taxes and bond offerings are not best conceptualized as funding sources for the Treasury, but rather as reserve draining devices to maintain price and interest-rate stability (Tymoigne, 2013).

In most countries, commercial banks' reserve accounts with the central bank must have a positive balance at the end of every day; in some countries, the amount is specifically set as a proportion of the liabilities a bank have that is on its customers. This is known as a reserve requirement. At the end of every day, a commercial bank will have to examine the status of

their reserve accounts. Those that are in deficit have the option of borrowing the required funds from the central bank, where they may be charged a lending rate which is also referred to as the discount rates on the amount they borrow.

In a balanced system, where there are just enough total reserves for all the banks to meet requirements, the short-term interbank lending rate will be in between the support rate and the discount rate. Both the Treasury and the central bank are involved in these reserve management operations to maintain interest rate stability (Palley, 2012).

2.2.3 The Mckinnon/Shaw Theory

The theoretical specification of the financial deepening equation draws on the literature of finance and development which postulate a symbiotic relationship between the evolution of the financial system and the development of the real economy.The literature on this relationship predicts that financial deepening depends on real income and real interest rate. This is predicted by both the McKinnon and Shaw models and in the endogenous growth literature (Mckinnon, 1973).

2.2.4 Supply-Leading Hypothesis

The existence and development of the financial markets brings about a higher level of savings and investment and enhance the efficiency of capital accumulation. The supply leading hypothesis suggests that financial deepening fuels growth.The contention of this hypothesis is that, a well-functioning financial institutions can promote overall economic efficiency, create and expand capital accumulation, transfer resources from traditional (non-growth) sectors to the modern growth inducing sectors and also promote a competent entrepreneur response in these modern sectors of the economy.
Early economists like Mckmnon (1973), Schumpter (1911), have strongly supported the view of finance led caused relationship between finance and economic growth.
These authors are of the opinion that causality proceeds from financial to economic development, it is only at a later stage that financial development leads on to growth.

2.2.5 Demand-Following Hypothesis

Robinson, J. (1952) has an opinion that economic activity propels banks to finance enterprises. Thus, where enterprises lead, finance follows. This hypothesis view is that the development of the financial markets is merely a lagged response to economic growth.

This implies that any early efforts to develop financial markets might lead to a waste of resources which could be allocated to more useful purposes in the early stages of growth. As the economy advances, this triggers an increase demand for more financial services and thus leads to greater financial development.

Some research work postulate that economic growth is a casual factor for financial development. According to them, as the real sector grows, the increasing demand for financial services stimulates the financial sector (Onyemachi C. 2012).

2.3 Factors affecting bank profitability

Theoretically factors affecting bank profitability are mainly divided into two categories as internal and external variables. The internal (bank-specific factors) are factors that are related to internal efficiencies and managerial decisions. As stated in the above section the efficiency and portfolio theory highly assume as bank performance is influenced by those internal factors that are related to internal efficiencies and managerial decisions.

Such factors include determinants such as bank capital, bank size, asset quality, income diversification, liquidity risk and operational efficiency (expenses management). On the other hand, the market power theory assumes as bank profitability is a function of external market factors. Accordingly, one of the external factors (variables) that can affect bank profitability is industry specific factors.

Such factors mainly include industry concentration or market share as a major determinant factor of bank profitability. Finally, the macroeconomic factors that can affect bank profitability include factors such as GDP, money supply growth, and inflation rate among others. The exact relationship between these factors and the bank profitability and the significance of the relationship remain as questions to be addressed more specifically in the context of Ethiopia.

2.3.1 Macroeconomic Factors

2.3.1.1 Gross Domestic Product Growth

Gross domestic product has also been identified as another factor. Gross domestic product (GDP) is most commonly used macroeconomic indicator to measure total economic activity within an economy. The growth rate of GDP reflects the state of the economic cycle and is expected to have an impact on the demand for bank loans. The economic conditions and the specific market environment would affect the bank's mixture of assets and liabilities According to Ongore and Kusa (2013), trend of GDP affects the demand for banks asset in the sense that when trends are leaning towards a declining GDP growth, demand for credit falls which in turn negatively affect the profitability of banks. Favourable economic conditions will affect the demand and supply of banking services positively.

Therefore, during boom the demand for credit is relatively high compared to recession periods (Sufian and Habibullah, 2010).

Another view on the relationship between GDP and commercial bank's profitability is that by Vong and Hoi (2009) who assert that there is a general perception that loan defaults are normally lower in times of favourable economic growth, while higher during unfavourable economic growth and these developments do affect the profits of the commercial banks in either direction depending on the circumstances.

Bank's profitability is limited by the growth rate of the economy. If the economy is growing at a good rate, a soundly managed bank would profit from loan.

Economic growth can enhance bank's profitability by increasing the demand for financial transactions, i.e., the household and business demand for loans. Strong economic conditions also characterized by the high demand for financial services, thereby increasing the bank's cash flows, profits and non interest earnings. Thus there is a positive relationship between the growth rates of Gross domestic product and the profitability of the bank.

2.3.1.2 Inflation

Inflation has an effect on fiscal policy and monetary policy. In addition, the impact of inflation depends on whether it has been anticipated or not anticipated, that is, if it is anticipated the effects on ROA is positive, if not anticipated the effect would be negative on

ROA (Pan & Pan 2014). Theoretically, inflation reduces credit expansion by contributing to higher net interest margins (Flamini et al, 2009). They further argue that the extent to inflation effects on bank profitability depends on whether future movements in inflation are fully anticipated, which, in turn, depends on the ability of banks to accurately forecast future movements in the relevant control variables. An inflation rate that is fully anticipated raises profits as banks can appropriately adjust interest rates in order to increase revenues. The negative effect of inflation could be the result of the inability of banks to correctly forecast and anticipate inflation in the economy.

Athanasoglou (2008) argue that the question is how mature an economy is so that future inflation can be accurately forecast and thus banks can accordingly manage their operating costs. As such, the relationship between the inflation rate and profitability is unclear and depends on whether or not inflation is anticipated.

An inflation rate fully anticipated by the bank's management implies that banks can correctly regulate interest rates in order to increase their revenues quicker than their costs and thus obtain higher profits. On the contrary, unanticipated inflation could lead to inappropriate adjustment of interest rates and consequently to the possibility that costs could increase more rapidly than revenues.

Other researchers who have found the same negative effect to ROA Gul et al (2011) argue that if banks expect general inflation to be higher in the future, they may believe that they can increase their prices without suffering a drop in demand for their output.

The effect of inflation on bank profitability depends on the rate at which the bank's wages and other operating expenses increase compared to inflation. This usually depends on accuracy of the prediction of the future inflation which enable banks manage their operating costs. Perry (1992) supports this argument by stating that when inflation expectations are fully anticipated by the bank management, it provides room for interest rate adjustment in order to accelerate increase in revenues faster than the costs and subsequently, higher economic profits. On the contrary, Rasiah (2010) argues that the move by central banks in their quest to control inflation result in increased cost of borrowing as well as a fall in credit-creating capacity and subsequently the loans given to the commercial banks. This trickles down to a decline in the loans given by commercial bank.

Furthermore, inflation has an adverse effect on commercial bank's profitability as it erodes the real value of bank's assets relative to their liabilities, hence it affects profits.

2.3.1.3 Exchange rate

Real exchange rate is commonly known as a measure of international competitiveness. It is also known as index of competitiveness of currency of any country and an inverse relationship between this index and competitiveness exists. Lower the value of this index in any country, higher the competitiveness of currency of that country will be. It is a widely held view that exchange rate volatility should affect corporate expected cash flows and hence its performance by causing changes in the home currency denominated revenues (costs) and the terms of competition for firms with international activities (Levich and Amihud 1999).

2.3.1.4 Lending Interest Rates

As for the interest rate, the relationship between the interest rate and bank profits is said to be positive (Vejzagic and Zarafa, 2014). In general, the variable interest rate has been cited in most studies as profitability determinant of commercial banks.

This is on the basis that net interest income which is a difference between interest income and interest expenses largely affects the commercial bank's profits. Interest rate is the price a borrower pays for the use of money they borrow from a lender/financial institutions or fee paid on borrowed assets (Crowley, 2007). Interest can be thought of as "rent of money". Interest rates are fundamental to a "capitalist society' and are normally expressed as a percentage rate over the period of one year. Interest rate as a price of money reflects market information regarding expected change in the purchasing power of money or future inflation (Ngugi, 2001).It is widely believed that fluctuations of market interest rates exert significance influence on the performance of commercial banks.

According to Samuelson (1945), under general conditions, banks' profit increases with rising interest rates. He argued that the banking system as a whole is vastly helped rather than hindered by an increase in interest rates. A more accurate measurement of how fluctuations on market interest rates affect banking firms largely depends on the sensitivity of bank's assets and liabilities (interest rates and volume) towards variations in open market.

Kipngetich (2011) did a study on the relationship between interest rates and financial performance of commercial banks in Kenya and found that there is a positive relationship between interest rates and financial performance of commercial banks. Banks should therefore carefully manage their interest rates to improve their financial performance. Lending interest rates is expected to have a positive relationship with the profitability of commercial banks.

2.3.1.5 Financial deepening

Onyemachi, C (2012) defined financial deepening as an effort aimed at developing the financial system that is evident in increased financial instrument/assets in the financial markets-money and capital markets, leading to the expansion of the real sector of the economy.

Obviously, it is the effort of developing countries to achieve growth through financial intermediation. Within the finance-growth nexus literature, Oya, P.A. and Dama (2006) argued that financial intermediaries mobilize pool and channel domestic savings into productive capital and by doing so they contribute to economic growth. If this view is to be accepted, then a competitive and well-developed banking sector must be an important contributor to (regional or national) economic growth. The definition of financial deepening reflects the share of money supply to GDP. The most classic and practical indicator related to financial deepening is the ratio of M2/GDP.

2.4 Empirical Review

2.4.1 Review of studies in other countries

There are numerous studies that have empirically investigated the various macroeconomic determinants of profitability among commercial banks. The research tries to review some of the empirical studies below

Sara Kanwal and Mohammed Nadeem (2013) on their study of the impact of macroeconomic variables on profitability of public limited commercial banks in Pakistan for years 2001-2011 they used Pooled Ordinary Least Square (POLS) method to examine the effect of 3 major external factors; inflation rate, real gross domestic product (GDP) and real interest rate on

profitability indicators; return on assets (ROA), return on equity (ROE) and equity multiplier (EM) ratios in 3 separate models. The empirical findings indicate a strong positive relationship of real interest rate with ROA, ROE and EM. Secondly, real GDP is found to have an insignificant positive effect on ROA, but an insignificant negative impact on ROE and EM. Inflation rate on the other hand, has a negative link with all 3 profitability measures. Overall, the selected macroeconomic factors are found to have a negligible impact on earnings of commercial banks.

Alper and Anbar (2011) investigated bank specific and macroeconomic determinants of commercial bank profitability in Turkey over the period of 2002-2010. The study uses both return on asset (ROA) and return on equity (ROE) as proxy for bank profitability. By employing balanced set of panel data and fixed effect model, the result shows that only real interest rate is positively related with profitability in regards to macroeconomic variables. In other words, an increase in real interest rate which is influenced by increase in inflation rates would lead to an increase in commercial banks' profitability in Turkey. Bergen (2010) studied that countries with higher inflation observes that there is depreciation in their currency in relation to the currencies of their trading partners. This is also usually accompanied by higher interest rates resulting into a positive relationship between inflation and performance of banks.

 Waseem et al (2014) studied on the impacts of inflationary trends on banks' performance in Pakistan. The study concluded that as inflation increases ROA, ROE and net interest margin of Muslim Commercial Bank Limited, Allied Bank Limited, United Bank Limited and Bank Al-Falah Limited also increases. That is there is a Positive association among inflation and bank performance of this large banking segment of the Pakistan banking industry. Aburime (2008) used a sample of 154 banks with 1255 individual observation on unbalanced panel data over the period 1980-2006 to investigate the macroeconomic determinants of bank profitability in Nigeria. The result revealed that real interest rate, inflation, monetary policy and foreign exchange regime are positively associated with banks' return on assets.

Muhammad Sajid Saeed (2014) investigates the impact of bank-specific, industry-specific, and macroeconomic variables on bank profitability before, during, and after the financial crisis of 2008 of United Kingdom. For this purpose, 73 UK commercial banks are selected on

the basis of availability of required information. The empirical data for these banks are collected for the period from 2006 to 2012 from Bank scope and Data-stream databases.

The regression and correlation analyses are performed on the data and concluded that bank size, capital ratio, loan, deposits, liquidity, and interest rate have positive impact on ROA and ROE while GDP and inflation rate have negative impact.

Ben Naceur & Goaied (2008) examined the impact of bank characteristics, financial structure and macro-economic conditions on Tunisian banks" net interest margins and profitability during the period from 1980 to 2000. They suggested that banks which hold a relatively high amount of capital and higher overhead expenses tend to exhibit higher net-interest rate margin and profitability levels, while size was negatively related to bank profitability. During the period under study, they found that stock market development had a positive impact on bank profitability.

The empirical findings suggested that private banks were relatively more profitable than their state owned counterparts. The result indicated that macroeconomic conditions had no significant impact on Tunisian banks profitability.

Garcia-Herrero et al (2009) analyzed the main determinants of profitability for Chinese banks by employing a panel data set for 87 banks from 1997-2004.They found that better capitalized banks, a relatively larger share of deposits, and more X-efficient banks tend to be more profitable. Hence, a less concentrated banking system as well as lower government intervention increases bank profitability. Furthermore, from the macroeconomic variables included, higher real interest rates on loans and inflation appear to foster profitability while the volatility of interest rates reduces it.

Gul et al (2011) examined the relationship between bank-specific and macro-economic characteristics over Pakistan bank profitability by using data of top fifteen Pakistani commercial banks over the period 2005-2009. Their paper used the Pooled Ordinary Least Square method to investigate the impact of assets, loans, equity, deposits, economic growth, inflation and market capitalization on major profitability indicators i.e., return on asset , return on equity, return on capital employed and net interest margin separately.

The empirical results have found strong evidence that both internal and external factors have a strong influence on the profitability.

Christine Nanjala Simiyu (2015) this study endeavors to investigate the effect of macroeconomic variables on financial profitability of listed commercial banks in the Nairobi Securities Exchange (NSE) for years 2001 to 2012. Panel data analysis using Fixed Effects model was applied on the data to examine the effects of three major macroeconomic variables which included: Gross Domestic Product (GDP), Exchange rates, and interest rates on profitability of the listed commercial banks. The study findings indicated that real GDP growth rate had positive but insignificant effect to profitability of commercial banks as measured through Return on Assets (ROA). Further, real interest rates had a significant negative influence on profitability of listed commercial banks in Kenya. While the exchange rate had a positive significant effect on the profitability of listed commercial banks on Nairobi Securities Exchange.

Johannes Peyavali Sheefeni (2015) on his paper analyses the macroeconomic determinants for commercial bank's profitability in Namibia. The study employed the techniques of unit root, co integration, and impulse response functions, and forecast error variance decomposition on the quarterly data covering the period 2001 to 2014. The results reveal that the variables gross domestic product, inflation rate and interest rate do not significantly influence commercial bank's profitability in Namibia. This suggests that the macroeconomic environment does not play a role in influencing the profitability of the commercial banks.

Professor Ifuero Osad Osamwonyi and ChijukaIfy Michael, their research investigate the impact of macroeconomic variables on profitability of banks in Nigeria from 1990-2013. Pooled Ordinary least method is used to determine the effect of three major factors; gross domestic product (GDP), interest rate (INTR) and inflation (INFR) on return on equity (ROE) which proxies' profitability. The findings from the empirical point of view show a positive relationship of gross domestic product (GDP) with return on equity (ROE). Interest rate and inflation rate have a negative relationship with return on equity (ROE).
Gross domestic product have a significant positive effect on Return on equity(ROE) while interest rate have a significant negative effect on return on equity(ROE) but inflation is not significant at all levels of significance.

According to Evans Ovamba Kiganda (2014) effect of macroeconomic factors on bank profitability in Kenya with Equity bank in focus to understand country and bank specific

characteristics. Specific objectives were to determine, examine and evaluate effect of; economic growth (real GDP), inflation and exchange rate on bank profitability in Kenya with Equity bank in focus respectively. This study was modelled on the theory of production and based on correlation research design. Sample size consisted annual data spanning 5 years from 2008 to 2012. Data was obtained from the World Development Indicators, published Equity bank documents (annual reports, investor briefings and financial statements). To accomplish this task, the study used Cobb-Douglas production function transformed into natural logarithm. The study employed OLS to establish the relationship between macroeconomic factors and bank profitability. The results indicated that macroeconomic factors (real GDP, inflation and exchange rate) have insignificant effect on bank profitability in Kenya with Equity bank in focus at 5% level of significance.

In Tunisia, Naceur (2003) investigated the impact of banks characteristics, final structure and macroeconomic indicators on bank's net interest margin and profitability for the 1983-2000 periods. Panel data techniques were used particularly both fixed effects and random effects models were estimated. The findings of the study are that inflation and growth rates have negative impact while stock market development has positive impact on profitability and net interest margin.

Athanasoglou, Delis and Stakouras (2006) analyzed the effect of selected set of determinants on banks profitability in the South Eastern European region over the period 1998-2002. Using an unbalanced panel dataset, the study reveals that inflation has a strong effect on profitability, while bank's profits are not significantly affected by real GDP per capital fluctuations.
And the study in Switzerland, Detrich and Wanzennied (2009) investigated the determinants of the profitability of commercial banks using data of 453 banks from 1997 to 2006. In employing panel data approach, the results from the study show that macroeconomic factors, GDP growth variable has a positive effect on bank profitability, while the effect of tax rate and market concentration rate has a significant negative effect on bank profitability.

Sayilgan and Yildirim (2009) investigates the relationship between the return on assets and the return on equity ratio for a sample of Turkish banks for the 2002-2007 time period using monthly data. The profitability of the banking sector seems to have increased along with

declining inflation rate, consistently increasing industrial production index and improving budget balance.

Alper and Anbar (2011) study looked at the bank-specific and macroeconomic determinants of the bank's profitability in Turkey over the time period from 2002 to 2010. The bank profitability is measured by return on assets (ROA) and return on equity (ROE) as a function of bank-specific and macroeconomic determinants. Using a balanced panel data set, the results show that with regard to macroeconomic variables, only the real interest rate affects the performance of banks positively, suggesting that higher real interest rate can lead to higher bank profitability. Acarvaci and Calim (2013) analyses the bank specific and macroeconomic factors that affect the profitability of commercial banks in Turkish banking sector by using Johansen and Juselius co integration test approach. Data for the period 1998 to 2011 from the three biggest state-owned, privately-owned and foreign banks were used for analysis.

The macroeconomic determinants of study are real gross domestic product, inflation rate, real exchange rate and real interest rate. The results on macroeconomic factors show that real gross domestic product and real exchange rate have been effective on the profitability.

Azeez and Gamage (2013) examined the impact of bank specific, industry specific and macro-economic variables on net interest margin of Sri Lankan commercial banks over the period of 1999-2011 within the dealership framework of Ho and Saunders (1981) Of the macroeconomic variables, it was found that inflation has a positive influence on profitability while GDP growth has a negative influencing on profitability of the commercial banks.

Recently, Sufian and Habibullah, (2010) show that economic growth affects positively banks profitability in Indonesia from 1990 to 2005. Acaravci and Çalim (2013) confirm this find on the Turkish Banking sector. However, Simiyu and Ngile (2015) find that real GDP growth rate has positive but insignificant effect on the ROA in the Nairobi from 2001 to 2012.

On the other hand, Tan and Floros (2012) find a negative relationship between GDP growth and bank's profitability in China over the period 2003-2009. Francis (2013) reveals the same result in 42 Sub-Saharan countries from 1999 to 2006, while Masood, and Ashraf (2012) show that real GDP has a negative effect on banks' ROA, and a positive effect on ROE.

Concerning the inflation, Demirguc-Kunt and Huizinga (1999) show that inflation rate has positive impact on banks' performance because banks manage their costs well under high inflation and Bashir (2003) finds the same results in the Middle Eastern Islamic banks' sector, while Asutay and Izhar (2007) find a negative and significant relationship between banks' profitability and inflation in Indonesia as well as Khrawish (2011) suggest that there is a significant and negative relationship between commercial banks ROA and inflation rate in Jordanian from 2000 to 2010.About exchange rate, in Nigeria, Isaac (2015) indicates that unit increases in exchange rate is driven by an increase in profit after tax and equally shows that there is a significant relationship between exchange rate management and performance of financial institutions, most especially banks. Moreover, Aburime (2009) suggests that the exchange rate regimes are significant macroeconomic determinants of banks' profitability in Nigeria from 1980 to 2006.

2.5.2 Review of studies in Ethiopia

Habtamu Nigussie (2012) investigates 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 for the three bank profitability measures; Return on Asset (ROA), Return on Equity (ROE), and Net Interest Margin (NIM). Fixed effect regression model was applied to investigate the impact of capital adequacy, asset quality, managerial efficiency, liquidly, bank size, and real GDP growth rate on major bank profitability measures i.e., (ROA), (ROE), and (NIM) separately. 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.

Samuel (2015) investigates determinants of commercial banks profitability in Ethiopia by using panel data of eight commercial banks from year 2002 to 2013. The study used mixed research approach and secondary financial data are analyzed by using multiple linear regressions models for the bank profitability measure, Return on Asset (ROA). Fixed effect regression model was applied to investigate the impact of bank size, capital adequacy,

liquidity risk, operating efficiency, management efficiency, employee efficiency, funding cost, banking sector development, real GDP, inflation rate and foreign exchange rate on Return on Asset (ROA).The findings of the study show that bank size, capital adequacy and gross domestic product have statistically significant and positive relationship with bank's profitability. On the other hand, variables like liquidity risk, operational efficiency, funding cost and banking sector development have a negative and statistically significant relationship with banks' profitability.

However, the relationship for management efficiency, employee efficiency, Inflation and foreign exchange rate is found to be statistically insignificant. The study suggests that focusing and reengineering the banks alongside the key internal drivers could enhance the profitability as well as the performance of the commercial banks in Ethiopia. Tadesse Getachew,(2015) seek to examine the composite impact of exchange rate on the profitability (ROE) of commercial banks in Ethiopia using a balanced panel data set of banks over the period of 2000-2014.

Furthermore, this study tried to determine how exchange rate affects the growth of bank loan with the intension to identify whether one of the indirect effects of exchange rate on bank profitability is through its effects on loan growth. The empirical findings of this study suggest that exchange rate has statistically significant negative impact on the profitability of commercial banks in Ethiopia. The result of the model estimated to examine the impact of exchange rate on loan growth of commercial banks in Ethiopia showed that exchange rate has statistically significant positive impact on the loan growth of banks in Ethiopia.

Moreover, from the independent variables included as control variables in the regression analysis, loan growth rate and GDP growth are found to have statistically significant positive impact on bank profitability in Ethiopia, while loan loss expense ratio (Loan loss expense to total loan) is found to have statistically significant negative impact on bank profitability in Ethiopia.

Similarly, from control variable included in the loan growth model, number of bank branches, lending interest rate and deposit to loan ratio are found to have statistically significant negative impact on the bank loan growth in Ethiopia.

DerejeTuri, (2015) in his study of Exogenous Determinants of Commercial Banks Profitability in Ethiopia examines the effect of external determinants on Ethiopian commercial banks from the period 1985 -2013.External determinants were seen by classifying them in to industry-specific and macroeconomic determinants. The study used OLS estimation method to measure the effects of external determinants on profitability. Profitability was measured by three indicators: Average Return on Asset, Average Return on Equity and Net Interest Margin in order to analyze the behaviour of each across years.

The estimation results show that the external variables in the model altogether explain ROA significantly. However, the explanatory variables fail to explain the rest indicators; ROE and NIM. Being seen independently, the coefficients of all explanatory variables were not significant at 10%.

2.6 Summary and knowledge gap

The literatures that are discussed so far showed that, determinants of banks profitability mainly macroeconomic factors. However, most of the empirical literatures that are discussed so far appeared to have focused on studies that were conducted in the banking sector of different countries outside Ethiopia.

This is because not many studies have been assessed on macroeconomic determinants of banks profitability; most studies of determinants of bank profitability are only considered bank specific explanatory variable and few studies try to consider only one or two macroeconomic variables which are not deeply investigated.

In the context of Ethiopia, the macroeconomic determinants related studies conducted by DerejeTuri (2015) in his study of exogenous determinants of commercial banks profitability try to consider some of macroeconomics variables these are GDP, TilahunTadesse(2015) study the impact of exchange rate on commercial banks profitability and HabtamuNigussie(2015) assessed the determinants of private commercial banks profitability, consider bank specific, industry specific and also macroeconomic factors but the macroeconomic variables are not deeply investigated.

In general, the lack of sufficient research on the macroeconomic determinants of commercial banks profitability in Ethiopian banking sector and the focus of the existing bank profitability studies being only on the banks specific determinants initiates this study.

Hence, the purpose of this study is to investigate the macroeconomic determinants of bank profitability in Ethiopian commercial banking sector by utilizing an econometrics model to estimate the macroeconomic determinants of profitability of commercial banks in Ethiopia which is proposed to fill the existing knowledge gap.

2.7 Conceptual Framework for the Study

From the literature review, discussed above, the researcher constructed the following conceptual framework to summarize the main focus and scope of this study in terms of dependent and independent variables included
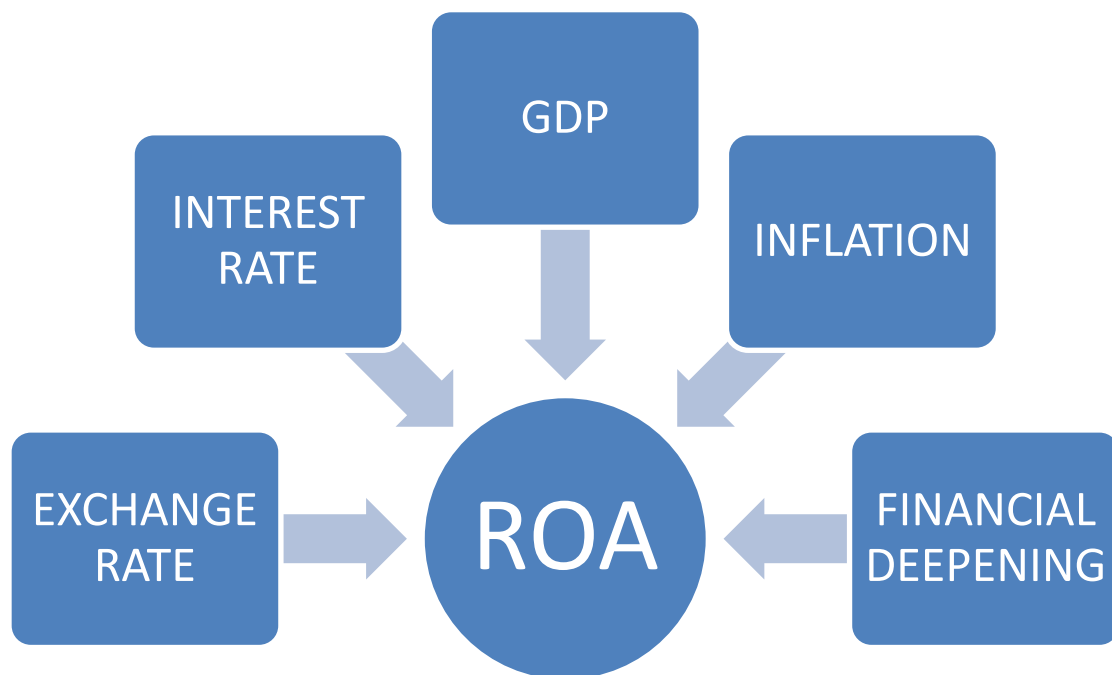
Figure 2 Conceptual Framework for the Study

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introductions

This chapter describes the research design and methodologies that were undertaken in conducting the study to arrive at conclusions regarding the relationship between macroeconomic factors and the profitability of commercial banks in Ethiopia. Specifically, the chapter covers: research design, population, study sample; data collection, data analysis and model specification.

Secondary data used for this research those data gathered from national bank of Ethiopia, Ministry of Finance and Economic Cooperation and commercial banks in Ethiopia covering the time period of 2001/2002 to 2015/2016.

3.2 Research Design

The main objective of this study is to examine the impact and the relationship between selected macroeconomic variables and commercial banks profitability in Ethiopia for the period covers 2001/2002 to 2015/2016. The researcher adopts explanatory research method to find the causal relationship, because one of the differences between descriptive and explanatory research is the explanatory research used to show cause and effect relationship between dependent and independent variables.

3.3 Population and sampling design

Population of the study refers the collection of possible observation and the target population for this study is the banking sector in Ethiopia. Currently one government and sixteen private commercial banks are operating in the country.

3.4 Sampling Design

The main objective of this study is to evaluate the performance of the commercial banks of Ethiopia. Focusing on how and to what extent macroeconomics factors determine the profitability of commercial banks. The research used purposive sampling method. And the criterion used for selecting the sample bank is banks service years.

From all commercial banks listed by NBE seven banks are taken as a sample which has been in the business before 2001/2002 G.C or operating in the country fifteen years and above. The commercial banks which are taken as sample for this study are shown in the table below.

Table 1 List of bank select for this research

No	Name of banks	Year of establishment
1	Commercial bank of Ethiopia(CBE)	1942 G.C
2	Awash international bank S.C(AIB)	1994 G.C
3	Dashen bank S.C(DB)	1995 G.C
4	Abyssinia bank S.C(BOA)	1996 G.C
5	Wegagen bank S.C(WB)	1997 G.C
6	United bank S.C(UB)	1998 G.C
7	Nib international bank S.C(NIB)	1999 G.C

Source developed for the research

3.5 Source of data

Data was obtained from secondary data source mainly from NBE annual report, Ministry of finance and Economics Cooperation reports (MOFEC), Audited financial statement of the banks and various international organization articles and also from previous studies. Macroeconomic variables: inflation rate, Real GDP growth rate, exchange rate, lending interest rate, financial deepening data collect from MOFEC and NBE. The profitability measurement ROA obtain from audited financial statement of the banks. This study used the data from 2001/2002 to 2015/ 2016.

3.6 Financial Performance Measures

Financial profitability of commercial banks is measured through the following variables; ROE is a financial ratio that refers to how much profit a company earned compared to the

total amount of shareholder equity invested or found on the balance sheet. ROE is what the shareholders look in return for their investment. A business that has a high return on equity is more likely to be one that of generating cash internally.

Thus, the higher the ROE the better the company is in terms of profit generation. It is further explained by Khrawish (2011) that ROE is the ratio of Net Income after taxes divided by Total Equity Capital. It represents the rate of return earned on the funds invested in bank by its stockholders. ROE reflects how effectively a bank management is using shareholders' funds. Thus, it can be deduced from the above statement that the better the ROE the more effective the management in utilizing the shareholder's capital. ROA is also another major ratio that indicates the profitability of a bank. It is a ratio of Income to its total asset. It measures the ability of the bank management to generate income by utilizing company assets at their disposal.

In other words, it shows how efficiently the resources of the company are used to generate the income. It further indicates the efficiency of the management of a company in generating net income from all the resources of the institution (Khrawish, 2011).

Return on asset (ROA), captures the aspect of performance of a bank in terms of its profitability, it is the ratio of net income to total assets. It is a ratio that is directly affected by internal factors of a bank that are financial conditions of a bank, but as well as external factors to a bank such as economic conditions and government policies (Almazari, 2014, Saeed 2014, Jaber 2014, Gul et al 2011) Return on Equity (ROE), measures the rate of return of ownership interest of common stock owners. It measures the efficiency in generating profit from every unit of equity ownership.

Net interest margin (NIM), is a measure of the difference between interest income and interest expense relative to the value of the assets.
It is as a rule articulated as a percentage of what the bank earns on loans and other assets in a time period minus the interest expensed on borrowed funds divided by the average value of the assets on which it earned income in that time period (Gul et al, 2011).

ROA and ROE are most commonly used ratios for measuring profitability in any organization including banks and other financial institutions.ROA indicates the profit

generated per pound of assets and decides how bank used investment resources over the year to generate profit (Sheeba, 2011). In addition; it also shows how a bank effectively utilizes its managerial efficiency to transform assets into earnings.

The higher ROA ratio points out higher performance whereas the lower ROA figure indicates inadequate managerial efficiency of the banks. Different banks in the banking industry are also compared with each other on the basis of ROA.

ROE is measured as dividing the net income over shareholder's equity. Like ROA, ROE also indicates how well a bank uses its managerial efficiency and investment funds to achieve higher profitability level. ROE figure between 15and 20 percent is a good indication for the banks (Sheeba, 2011).

3.7 Description variable and hypotheses

Dependent variable (Return on Asset (ROA)

As Golin (2001) points out, the ROA has emerged as key ratio for the evaluation of bank profitability and has become the most common measure of bank profitability. The following authors also used ROA as a measure of bank profitability (Yuqi Li 2006), Abebaw and Depaack (2011), Berger (1995), IndranarainRamlall (2009), Imad et al (2011), Tobias and Themba (2011), Belayneh (2011), and Athanasoglou et al (2008)). The ROA reflects the ability of a bank's management to generate profits from the bank's assets.

It shows the profits earned per birr of assets and indicates how effectively the bank's assets are managed to generate revenues, although it might be biased due to off-balance-sheet activities.

Average assets were used in this study, in order to capture any differences that occurred in assets during the fiscal year.

ROA can be calculated as:

$Return on Asset (ROA) = \underline{Net Profit After Tax}$

$$AverageTotalAssets$$

This is probably the most important single ratio in comparing the efficiency and operating performance of banks as it indicates the returns generated from the assets that bank owns**.**

There are mainly two reasons to use ROA as one of the measurement of bank profitability. First, it shows the profit earned per unit of assets and reflects the management ability to utilise banks' financial and real investment resources to generate profit (Hassan and Bashir.2003). Furthermore, Rivard and Thomas (1997) argue that bank profitability is best measured by ROA because it is not distorted by higher equity multipliers

Independent variable

I.   Growth domestic product (GDP)

According to Sufian and Habibullah (2010), favorable conditions in an economy will positively impact the level of financial transactions, and well managed banks will earn from loans and sale of securities. Also fast economic growth enhances bank profitability (Demirguc-Kunt& Huizinga, 1999).

H1: Gross domestic product has positive significant relationship with profitability

II.   Inflation

For any country, Inflation rate affects the bank profitability according to the economic conditions prevailing in that country (Alexiou & Sofoklis, 2009). They may induce a positive effect in countries where financial markets are well-developed and economies are in boom but negative effect in developing countries. The impact of inflation depends on whether it has been anticipated or not anticipated, that is, if it is anticipated the effects on ROA is positive, if not anticipated the effect would be negative on ROA (Qinhua pan &Meiling pan, 2014).

Bashir (2003) indicates that when inflation is anticipated, banks generate profits using high rates on loans in times of the high inflation rate and if it is unanticipated, banks would not adjust rates timely and overhead costs would rise quicker than inflation resulting in poor profits. Demirguc Kunt and Huizinga (1999) also observe a similar scenario for developing countries. Hypothesis will be:

H2: Inflation rate is positively associated with bank profitability.

III.   Lending interest rate

Banks may increase the lending rate as compared to the deposit rate and earn more profit overtime. Hypothesis 3 is proposed as follows:

H3: Average lending interest rate is positively related to bank profitability.

IV.   Exchange rate

The variability of foreign exchange rates is a potentially interesting factor that drives the level of profitability of commercial banks as it affects their financial intermediation process (Chiira, 2009). Kiganda (2014) on his study of the effects of macroeconomic factors on commercial banks profitability in Kenya found that exchange rate has negative insignificant effect on the banks profitability as expressed by ROA. Babazadeh and Farrokhnejad (2012) claimed that exchange rate has positive significant effect on the bank's profitability.

H4: Exchange rate is expected to have positive effect on profitability of commercial banks of Ethiopia.

V.   Financial deepening

Modernization of the economy (M2/GDP) serves as another independent variable and measured by dividing money supply M2 over GDP. This variable reflects the growth in money supply ratio in relation to GDP, i.e. financial deepening. (Feldman and Gang, 1990).This variable reflects the liquid money available in an economy which will lead to more growth opportunity.

The more the economy becomes modern the more the banking system becomes sophisticated in their services and hence we expect a positive relationship between this variable and banks profitability.

H6: financial deepening is expected to have positive effect on profitability of commercial banks of Ethiopia.

3.8 variables measurement and expected relationship

The definitions and measurement of each the dependent and the independent variables used in the study shows in the table below.

Table 2 **variables measurement and expected relationship**

Variables		Measurement	Expected sign
Dependent variable			
Commercial banks profitability	ROA	Ratio of net income to total asset	NA
Independent variables			
GDP	Gross domestic product	Real GDP growth (annual %)	+
INF	Inflation rate	Consumer price index(CPI)	+
LIR	Average lending rate	The average lending rate of banks	+
EXC	Exchange rate	Annual average	+
M2/GDP	Financial deepening	Ratio of money supply to gross domestic product	+

Source: developed for the research

3.9 Model Specification

In this research based on the past literature reviewed, a panel data regression is employed to examine the impact of macroeconomic variables on banks profitability.

The independent variables used in this study are gross domestic product (GDP) which is measured by real GDP growth rate, interest rate measured by average interest rate (lending), inflation, exchange rate (average) and financial deepening (M2/GDP). And the dependent variable commercial banks profitability measured by ROA.

The regression model is stating, ROA as a function of the selected macroeconomic variables is as shown below

ROAit= β0a+β1aGDP+β2aLIR+β3aINF + β4aM2/GDP+ β5aExch+ ε

Where

ROA= return on asset

INF= Inflation Rate (CPI);

GDP =Growth domestic product growth rate

LIR = Average Lending interest rate

Exch = Exchange rate

M2/GDP =Financial deepening

e =be error term

3.10 Data Analysis

The study made use of computer software 'e-views' version 8 to analyse the data. Given that the study model is a multivariate, the study used multiple regression technique in analysing the relationship between the selected macro-economic factors and the profitability of commercial banks in Ethiopia. The study employed multiple regression analysis which refers to testing hypothesis about the relationship between a dependent variable and independent variables (Gujarati 2003).

The research work adopted the Ordinary Least Square (OLS) as the estimation technique. The method of OLS is extensively used in regression analysis primarily because it is initiatively appealing and mathematically much simpler than any other econometric technique (Gujarati 2003).

3.10.1. Ordinary Least Square

According to Brooks (2008), ordinary least squares (OLS) or linear least squares are a method to estimate the slope and intercept in a linear regression model.

This study used an ordinary least squares (OLS) regression to estimate the linear equation. The rational for choosing OLS is that, if the Classical Linear Regression Model (CLRM) assumptions hold true, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators, Brooks(2008). In addition, as noted in Petra (2007) OLS outperforms the other estimation methods when the following holds; the cross section is small and the time dimension is short. Therefore, as far as both the above facts hold true in this study it is rational to use OLS. Thus, the following section discussed the CLRM assumptions.

According to Brooks (2008), the assumptions of ordinary least squares are:

1) The errors have zero mean.

2) The variance of the errors is constant and finite over all values.

3) The errors are linearly independent of one another.

 4) There is no relationship between the error and corresponding x variate.

3.10.2. Diagnostic Analysis

Diagnostic checking is done to test whether the sample is consistent with the following assumptions:

1. The model is correctly specified

2. There is no relationship between independent variables (No multicollinearity).

3. There is no relationship among the error term at the period t and the error term at period before t (No autocorrelation problem)

4. The error term is constant across the number of observations (Homoscedasticity).

5. The error term is normally distributed. If all the above assumptions are consistent with the sample, E-view result is accurate and reliable. The following tests are done in this research to test the above assumptions.

3.10.2.1 Heteroscedasticity

According to Brooks (2008), Heteroscedasticity means that error terms do not have a constant variance. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer Test, Breusch-Pagan-Goldfrey Test, White's Test and Autoregressive Conditional Heteroscedasticity (ARCH) test. In this study, the popular white test was employed to test for the presence of heteroscedasticity. The hypothesis for the Heteroscedasticity test was formulated as follow: H0: There is no Heteroscedasticity problem in the model. H1: There is Heteroscedasticity problem in the model. $\alpha = 0.05$ Decision Rule: Reject H0 if p-value is less than significance level. Otherwise, do not reject H0.

3.10.2.2 Autocorrelation

According to Brooks (2008), when the error term for any observation is related to the error term of other observation, it indicates that autocorrelation problem exist in this model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient.

The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated or overestimated. Due to the invalid hypothesis testing, it may lead to misleading results on the significance of parameters in the model. In this study to test for the existence of autocorrelation, the popular Breusch-Godfrey Serial Correlation LM Test was employed.

H0: There is no autocorrelation problem in the model.

H1: There is autocorrelation problem in the model.

$\alpha = 0.05$

Decision Rule: Reject H0 if p-value less than significance level. Otherwise, do not reject H0.

3.10.2.3 Multicollinearity

According to Brooks (2008), Multicollinearity will occur when some or all of the independent variables are highly correlated with one another.

If the multicollinearity occurs, the regression model is unable to tell which independent variables are influencing the dependent variable. The consequences of Multicollinearity are large variances and covariance of OLS estimators, wider confidence interval, insignificant t

ratio, high $R2$ but few significant t ratio, sensitivity of OLS estimators and their standard errors to small changes in data. There is no one unique method to detect the multicollinearity problem, it only have some rules of thumb, which are high $R2$ but few significant t ratio, high pair wise correlation coefficient and Variance Inflation Factor (VIF) or Tolerance (TOL). This study used high pair-wise correlation coefficients method to test the presence of multicollinearity problem in a regression model, because it can see the correlation of independent variables between each other one by one. If the correlation coefficient was higher than 0.8, the model would be considered as it consists of serious Multicollinearity problem (Guajarati 2004).

3.10.2.4 Normality

Normality tests are used to determine if a data set is well-modelled by a normal distribution. With the normality assumption, ordinary least square estimation can be easily derived and would be much more valid and straight forward. This study used Jarque Bera Test (JB test) to find out whether the error term is normally distributed or not.

The hypothesis for the normality test was formulated as follow: H0: Error term is normally distributed H1: Error term is not normally distributed α = 0.05 Decision Rule: Reject H0 if p-value of JB tests less than significance level. Otherwise, do not reject H0.

3.10.2.5 Model Specification

According to Brooks (2008), Specification error occurs when omitting a relevant independent variable, including unnecessary variable or choosing the wrong functional form, so that regression model will be wrongly predicted. If the omitted variable is correlated with the included variable, the estimators are biased and inconsistent. If the omitted variable is not correlated with the included variable, the estimators are unbiased and consistent.

Ramsey RESET test was used to see whether the developed model is correctly regressing. H0: the model is correctly specified H1: the model is not correctly specified α = 0.05 Decision Rule: Reject H0 if p-value is less than significance level. Otherwise, do not reject H0.

3.11 Conclusion

Chapter three included the methodology used to perform data analysis in Chapter four. This study employed quantitative and secondary data and Ordinary least square method to test the relationship between macroeconomic factors and profitability of commercial banks in Ethiopia. Besides that, a diagnostic test was conducted to confirm the reliability of the results. Chapter four will show out all the details regarding the hypothesis testing and diagnostic tests carried out for the collected data.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results and findings of the study based on the research objective. The results are presented in the form of summary tables. Regression and correlations analysis are used to answer the research objective. Accordingly, the descriptive statistics of all the variables used in this study and the results of hypothesis testing i.e. the estimated parameters of the regression equation, their significance, the connection between the independent variables and dependent variable according to the sign and the value of the parameters for the regression model are presented and discussed in detail.

4.2 Regression Method

The regression method used for this study was the pooled least square method which is one of the panel data analysis methods. This was used to determine the line of best fit for the model through minimizing the sum of squares of the distances from the points to the line of best fit. Through this method, the analysis assumed linearity between the dependent variable and the independent variables.

4.3 Descriptive statistics

The basic descriptive statistics of the variables are presented in Table 4. For each variable, the table shows mean, median, standard deviation, minimum and maximum values. In all, a total of 105 observations were presented for 7 commercial banks covering a period of 2002-2016.On average, banks sampled have a return on assets (ROA) of 2.6% over the entire time period from 2002 to 2016. The standard deviation for ROA is 7.5% with minimum and maximum values of 0.37% and 4.2% respectively.

When the mean of growth domestic product is 9.1%, minimum value is -.2.1% with a maximum value of 12.6 %and a standard deviation of (3.9).

This implies that economic growth in Ethiopia during the period of 2002 to 2016 remains reasonable stable and the result of this stable economic growth contribute positively to the commercial banks profitability. The other macro-economic variable employed in this study is inflation, had somewhat a higher standard deviation (9.73) compared to GDP; this implies that inflation rate in Ethiopia during the study period remains somewhat unstable. The other macroeconomic variable employed in this study exchange rate, had the higher standard deviation (4.8) compared to other remaining variables employed in the study; this implies that the foreign exchange rate in Ethiopia during the study period remains unstable. And the standard deviation of average lending interest rate is (1.14) which very low relative to other variable, these implies average lending rate (LIR) is more stable. Standard deviation of M2/GDP is also high next to inflation.

Table 3: descriptive statistics summary

	EXCH	GDP	INFL	LIR	M2/GDP	ROA
Mean	13.08933	9.166667	14.46667	11.22667	0.001333	2.638648
Median	10.40000	10.40000	10.60000	11.88000	3.200000	2.780000
maximum	21.10000	12.60000	36.40000	12.75000	6.700000	4.200000
minimum	8.540000	-2.100000	2.800000	9.250000	-16.70000	0.379000
Std.Dev	4.804088	3.946802	9.738244	1.144948	6.511639	0.756774
observation	**105**	**105**	**105**	**105**	**105**	**105**

4.4. Test results for the classical linear regression model assumptions

As mentioned in the methodology part of this study, as far as the assumptions of classical linear regression model hold true, the coefficient estimators of both α (constant term) and β (independent variables) that are determined by ordinary least square (OLS) will have a number of desirable properties, and usually known as Best Linear Unbiased Estimators (BLUE). Hence, the following sections discuss results of the diagnostic tests (i.e., heteroscedasticity, autocorrelation, multicollinearity, normality and model specification test)

that ensure whether the data fits the basic assumptions of classical linear regression model or not.

4.4.1. Heteroskedasticitytest

When the scatter of the errors is different, varying depending on the value of one or more of the independent variables, the error terms are heteroskedastic Brooks (2008). Heteroscedasticity test is very important because if the model consists of heteroskedasticity problem, the OLS estimators are no longer BEST and error variances are incorrect, therefore the hypothesis testing, standard error and confident level will be invalid.

A white' test has been made, to ensure that this assumption is no longer violated. The hypothesis for the heteroskedasticity test was formulated as follow;

H0: There is no heteroskedasticity problem

H1: There is heteroskedasticity problem.

Table 4 Heteroskedasticity Test result: white

	P-value	Decision rule
F-statistic	0.8911	Do not reject H0
Obs* R-squared	0.8691	Do not reject H0
Scaled explained SS	0.7696	Do not reject H0

Source: researcher Own computation

4.4.2 Test for Autocorrelation:

It is assumed that the distribution errors are uncorrelated with one another and that the errors are linearly independent of one another.

Autocorrelation error occurs when there is a serial correlation between residuals and their own past values. In this study, Breusch Godfrey Serial Correlation LM Test is used to carry out the autocorrelation test. The p-value is obtained to examine whether the autocorrelation problem occurs in the model.

If the p-value is more than 5% significant level, it implies that there is no autocorrelation problem in the model. The hypothesis for the model specification test was formulated as follow;

H0: There is no autocorrelation problem.

H1: There is autocorrelation problem.

α = 0.05

Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not reject H0.

Table 5 Autocorrelation test result: Breusch-Godfrey serial correlation LM test

	P value	Decision rule
Breusch-Godfrey serial correlation LM test	0.1299	Do not reject H0

Source: researcher Own computation

The above autocorrelation test result shows that do not reject the null hypotheses because the p value is 0.1299 which is above the significant level 0.05, thus we can concluded that there is no problem of auto correlation in this model.

4.4.3. Multicollinearitytest

According to Brooks (2008), multicollinearity will occur if some or all of the independent variables are highly correlated with one another. It shows the regression model has difficulty in explaining which independent variables are affecting the dependent variable. If multicollinearity problem is too serious in a model, either additional important variable should be added or unimportant independent variable should be dropped.

This study uses high pair-wise correlation coefficients method to detect the existence of multicollinearity high pair-wise correlation coefficients method sees the correlation of independent variables between each other one by one. According to Guajarati (2004), if the correlation coefficient is higher than 0.8, it is considered as the model consists of serious multicollinearity problem.

Table 6: Multicollinearity test result

	EXCH	GDP	INFL	LIR	M2/GDP

EXCH	1.000000	0.144907	-0.032287	0.693891	0.565557
GDP	0.144907	1.000000	0.050738	0.490951	-0.132680
INFL	-0.032287	0.050738	1.000000	0.303695	-0.526788
LIR	0.693891	0.490951	0.303695	1.000000	0.058803
M2_GDP	0.565557	-0.132680	-0.526788	0.058803	1.000000

Source: develop for the research

The above table showed that there is no strong pair-wise correlation between the explanatory variables (GDP, INFl, LIR, EXCH andM2/GDP). As a rule of thumb, inter-correlation among the independent variables above 0.80 signals a possible multicollinearity problem. In this study the highest correlation coefficient is 0.693891 between lending interest rate and exchange rate. Thus, it can be concluded that almost all variables have low correlation power which implies no multicollinearity problem in the explanatory variables selected to determine profitability of commercial banks.

4.4.4. Normality test

Normality test is used to determine whether the error term is normally distributed. Brooks (2008) noted that the Jarque-Bera statistic would not be significant for disturbance to be normally distributed around the mean.

The purpose of the Jarque-Bera test is to make sure that the data set is well modeled by a normal distribution. The hypothesis for the normality test was formulated as follow:

H0: Error term is normally distributed

H1: Error term is not normally distributed

$\alpha = 0.05$

Decision Rule: Reject H0 if P value of JB less than significant level 0.05. Otherwise, do not reject H0.

Figure 2 Histogram normality test

		Series: Standardized Residuals
		Sample 2002 2016
		Observations 105
	Mean	6.34e-18
	Median	0.007864
	Maximum	1.426624
	Minimum	-1.012489
	Std. Dev.	0.430365
	Skewness	0.078137
	Kurtosis	3.791570
	Jarque-Bera	2.848142
	Probability	0.240732
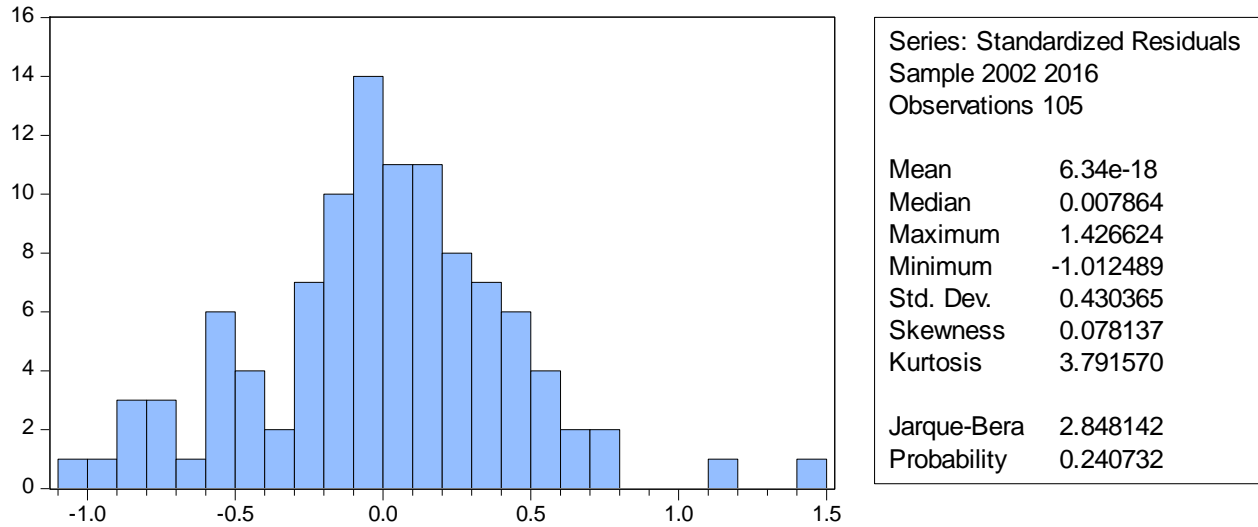
Table 7 Normality Test result: Bera-Jarque test

	P-value	Decision rule
Jarque-Bera test	0.2407	Do not reject H0

Source: researcher Own computation

Figure 2 indicated that distribution of the panel observation is symmetric about its mean. The Jarque-Bera statistic has a P-value of 0.2407 implies that the p-value for the Jarque-Bera test is greater than 0.05 which indicates that there was no evidence for the presence of abnormality in the data. Thus, the null hypothesis that the data is normally distributed should not be rejected since the p-value was considerably in excess of 0.05.

4.4.5 Model Specification

Model specification error occurs when omitting a relevant independent variable, including unnecessary variable or choosing the wrong functional form.

When the omitted variable is correlated with the variable which included, the estimators will be biased and inconsistent and model specification error will tends to occur. If the omitted

variable is not correlated with the included variable, the estimators are unbiased and consistent and model specification error will not occur.

Therefore, in order to select a correct estimated model, the researcher had carry out the Ramsey-RESET Test to check on the model specification. The hypothesis for the model specification test was formulated as follow;

H0: The model specification is correct.

H1: The model specification is incorrect.

$\alpha = 0.05$

Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not reject H0.

Table 8: Model specification Test result: Ramsey-RESET test

	Probability F -statistics	Decision rule
Ramsey-reset test	0.4031	Do not reject H0

Source: researcher Own computation

4.4.6 Model Selection (Random Effect versus Fixed Effect Models)

The econometrics model used to examine the impact macroeconomic factors on profitability of commercial banks in Ethiopia which is measured by return on asset (ROA) is a panel data regression model which should be either fixed-effects or random-effect model. The theoretical model is developed based on the finance theory from the methodological part of this study. The important issue from the equation panel model is it is not specified whether it is fixed effects or random effects model. So the focal point the researcher concern here is, to examine whether individual effects are fixed or random.

Because, there are broadly two classes of panel data estimator approaches that can be employed in empirical research: fixed effects models and random effects models. This also requires the high concern when the researcher employed the panel data approaches.

According to Gujarati (2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model (FEM) and random effect model (REM). Hence the choice here is based on computational convenience. On this score, FEM may be

preferable. Since the number of time series (i.e. 15 year) is greater than the number of cross-sectional units (i.e. 7 commercial banks), FEM is preferable in this case.

According to Brooks (2008), Verbeek (2004) and Wooldridge (2006), it is often said that the REM is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a FEM is more plausible when the entities in the sample effectively constitute the entire population/sample frame. Hence, the sample for this study was not selected randomly and equals to the sample frame FEM is appropriate.

4.5. Discussion of Regression results

The empirical evidence on the determinants of Ethiopian commercial banks' profitability is studied based on balanced panel data, where all the variables are observed for each cross-section and each time period.

The study has a time series segment spanning from the period 2002 up to 2016 and a cross section segment which considered seven commercial banks, namely, commercial bank of Ethiopia, Awash International Bank, Dashen Bank, Bank of Abyssinia, Wegagen Bank, United Bank and Nib International Bank.

To test the relationship between these commercial banks profitability and selected macroeconomics determinant variables the following linear regression model is developed.

$ROA_{it} = \beta_0a + \beta_1aGDP + \beta_2aINTR + \beta_3aINFL + \beta_4aExch + \beta_5 M2/GDP + \varepsilon$

Table 9 Result of Ordinary Least Square (OLS) Model

Independent Variable	Coefficient Value	P-Value	Sign
Exchange rate birr/USD	0.007319	0.7094	positive
Gross domestic product (GDP)	0.091803	0.0000 ***	Positive
Inflation rate (INFL)	0.021004	0.0009 ***	Positive
Averarge lending rate (LIR)	0.201744	0.0119 **	positive
Financial deepening(M2/GDP)	0.021359	0.0680*	positive

R-squared		0.676599
Adjusted R-squared		0.638348

Source: - Develop for the research

Note: *** significant at 1%

     ** Significant at 5%

     * Significant at 10%

$ROA_{it} = -0.588475 + 0.007319exch + 0.091803GDP + 0.021004INFL + 0.201744LIR + 0.021359M2/GDP$

The above table 9 showed the empirical result tested by Ordinary Least Square (OLS) from E-views software. The R-squared of this model is 0.676599, which means that 67.6% of the total variation of Ethiopian commercial banks profitability is determined by the total variation of gross domestic product, inflation rate, exchange rate and average lending rate and financial deepening.

Whereas, the adjusted R-squared is 0.638348, which means that 63.8% of the total variation of Ethiopian commercial banks profitability is determined by the total variation of gross domestic product, inflation rate, exchange rate and average lending rate, and financial deepening by taking into account the number of independent variables and sample size.

Although, the remaining 32.4% and 36.2% of the change is explained by other factors which are not included in this study model, both the R-squared and the Adjusted R-squared values in this study are found to be sufficient enough to infer that the fitted regression line is very close to all of the data points taken together (has more explanatory power). For panel data, R-Squared greater than 20% is still large enough for reliable conclusions (Cameron Trivedi, (2009), Hsiao (2007), cited in Nyamsogoro(2010).

4.5.1 ROA and GDP Growth

Hypothesis testing of the relationship between gross domestic product (GDP) and Ethiopian commercial banks profitability (ROA):
H0: Gross Domestic Product does not have a significant effect on commercial banks profitability.
H1: Gross Domestic Product has a significant effect on commercial banks profitability

Conclusion: Reject H0 since there is a positive significant relationship between gross domestic product (GDP) and commercial banks profitability.

Regression result showed on table 9 above, there is a positive relation between ROA and GDP growth at 0.091803.

When GDP increase by 1% banks profitability measured by ROA increase by 0.09 %. This show as the stimulated Ethiopian economy over the study period creates a new and potential demand for financial services.

The result about the impact of GDP growth on ROA is consistent with the results of Hassan and Bashir (2003). Pasiouras and Kosmidou (2007), Kosmidou (2008) and Samuel (2015) provide support to the argument of positive association between economic growth and financial sector performance.

This therefore means that growth in the economy will lead to growth in the demand and supply of funds from banks which in turn lead to higher profitability. Economic growth can enhance bank's profitability by increasing the demand for financial transactions, the household and business demand for loans.

Strong economic conditions also characterized by the high demand for financial services, thereby increasing the bank's cash flows, profits and non interest earnings. Thus there is a positive relationship between the growth rates of Gross domestic product and the profitability of the bank.

4.5.2 ROA and Inflation

Hypothesis testing of the relationship between inflation rate and Ethiopian commercial banks profitability:

H0: Inflation rate does not have a significant effect on Ethiopian commercial banks profitability.
H1: Inflation rate has a significant effect on Ethiopian commercial banks profitability.

Conclusion: Reject H0 since there is a positive and significant relationship between Inflation rate (INF) and Ethiopian commercial banks profitability (ROA).

The study found a positive relation between the ROA and the inflation of 0.021004 as shown in table 9. This means that as inflation increases by 1% ROA increased by 0.02%. This therefore implies that during the period under study the levels of inflation were anticipated by the Ethiopian commercial banks. This gave them the opportunity to adjust the interest rates accordingly and consequently to earn higher profits. This positive and significant relation of inflation with bank profitability also implies the commercial banks manage their operating cost and accurately predicating the future inflation. This finding is consistent with other research findings such as Athanasoglou (2008), Kosmidou(2006), Pasiouras (2007).

The positive relationship between inflation and bank profitability implies the bank income increase more than bank costs.

Higher inflation rate also generally associated with high loan interest rate and therefore, high income. Banks also obtain higher earnings from float or delays in crediting customer account in an inflationary environment.

However, if inflation is unanticipated and banks are sluggish in adjusting their interest rate, then there is possibility that bank costs may increase faster than bank revenues and hence adversely affect bank profitability.

4.5.3 ROA and exchange rate

Hypothesis testing of the relationship between exchange rate and Ethiopian commercial banks profitability:

H0: exchange rate does not have a significant effect on Ethiopian commercial banks profitability.
H1: exchange rate has a significant effect on Ethiopian commercial banks profitability.

Conclusion: Do not Reject H0 since there is a positive but insignificant relationship between exchange rate (Exch) and Ethiopian commercial banks profitability (ROA).

The regression result shows positive but insignificant relation between exchange rate and commercial banks profitability. As showed in table 9 when exchange rate increase by 1% ROA increase by 0.007319.

The coefficient of foreign exchange rate was positive as estimated, but it was not statistically significant, thus, the effect of foreign exchange rate on Ethiopian banks profitability is not

significant. The findings also suggested that as foreign exchange rate is not a determinant of bank's profitability in Ethiopia as far as the parameter for this variable is insignificant as illustrated by the large p-values of 0.7094.

In relation to previous literature the results for positive coefficients are similar to the parameters that are observed and revealed by the numbers of researchers Evans (2014) and Songul Kakilli (2013), and also similar with the study by Samuel (2015) on determinant of profitability of commercial banks in Ethiopia.

4.5.4 ROA and Average Lending Interest Rate

Hypothesis testing of the relationship between Average Lending Interest Rate and Ethiopian commercial banks profitability:

H0: Average Lending Interest Rate does not have a significant effect on Ethiopian commercial banks profitability.

H1: Average Lending Interest Rate has a significant effect on Ethiopian commercial banks profitability.

Conclusion: Reject H0 since there is a positive and significant relationship between Average Lending Interest Rate (LIR) and Ethiopian commercial banks profitability (ROA).

The study found a positive relation between the ROA and the lending interest rates of individual banks of approximately 0.201744 as shown in table 10. This means that as lending interest rates increase by 1% ROA increases by 0.2 %. The banking sector's profitability increase with interest rate, this is because increase in the interest rate directly increase the yield in cash, and proceed go directly to earnings.

They profit off the marginal difference between the yield they generate with this cash invested in short-term notes and the interest they pay out to customers. When the rate increase rise, these spread increases, with extra income going straight to earnings.

The significant positive relationship of average lending interest rate with ROA is in line with previous studies such as (Aburime (2008), Athanasoglou, Brissimis, & Delis(2005); Anwar & Herwany(2006), Demirguc-Kunt&Detragiache(1998), Demirguc-Kunt& Huizinga(1999), Staikouras& Wood(2004).

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4.5.5 ROA and financial deepening (M2/GDP)

Hypothesis testing of the relationship between financial deepening and Ethiopian commercial banks profitability:

H0: financial deepening does not have a significant effect on Ethiopian commercial banks profitability.
H1: financial deepening has a significant effect on Ethiopian commercial banks profitability.

Conclusion: Reject H0 since there is a positive and significant relationship at 10% between financial deepening (M2/GDP) and Ethiopian commercial banks profitability (ROA).

Financial deepening (M2/GDP) ratio had significant positive effect on profitability of the commercial banks.

When financial deepening increase by 1 % bank profitability measured by ROA increase by 0.021359, this shows that as ratio of money supply increases banks' profits increases and the strength of the relationship is strong. Increases in financial deepening provide access to money and create opportunities for investment and growth. A developed financial system broadens access to funds; conversely, in an underdeveloped financial system, access to funds is limited and people are constrained by the availability of their own fund and have to resort to high cost informal sources such as money lenders.

Promoting well managed financial deepening in low income countries (LICs) can enhance resilience and capacity to cope with shocks improve macroeconomics policy effectiveness, and support solid and durable inclusive growth. This economic growth led to financial sector to more profitability.

CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

The previous chapter presented the analysis of the findings and discussions of the study. The purpose of this chapter is to discuss the conclusions and recommendations. Accordingly, the chapter is organized in two sections, the first section presents the conclusions of the study and the second section presents the recommendations provided based on the findings of the study.

5.1. Conclusions

The study results revealed that the select macroeconomic variables influenced the profitability of banks as measured by ROA. The study also found that the ROA was positively correlated with GDP growth and Inflation, average lending interest rate, financial deepening and exchange rate but the relationship with exchange rate is insignificant. From the empirical result, all the variables of were in line with theoretical expectations. Considering the p-values, all the other variables were statistically significant except exchange rate. The objective of the study, which was to establish the relationship between macroeconomic variables and the profitability of commercial banks, was therefore met.

From the study results, it can be concluded that the macroeconomic variables can indeed influence the profitability of commercial banks. A review of the related literature revealed a general consensus from the theoretical and empirical studies that there is indeed a relationship between macroeconomic variables and financial performance of commercial banks. Empirical studies reviewed included Sufian et al (2009), Kosmidou (2008), Mamatzakis and Remoundos (2003), Athanasoglou*et al.* (2008), Kosmidou*et al.* (2006). Based on the empirical findings of this particular study suggested the following conclusions

First, the study concludes that though real GDP indicates the economic growth of the country, its increase have a significant positive effect on profitability of commercial banks. Annual real GDP growth rate is a measure of total economic activity.

It is expected to have an impact on numerous factors related to the demand and supply for banks deposits and loans. GDP growth is expected to have a significant positive relation on bank profitability.

In this context; the study established a positive influence and the result also show positive and significant influence of real GDP growth rate on commercial banks profitability.

Second, conclusion is on relationship between inflation and bank profitability measured by return on asset is also positive and significant, our first hypotheses says inflation and bank profitability will have positive/negative correlation based on the right predication of the inflation and how banks adjusting their interest rate considering the expected inflation rate. Thus the positive and significant relation implies that in Ethiopia inflation impact the profitability of commercial banks positively. If the inflation rate is fully anticipated by the bank's management, the bank can adjust interest rates appropriately to increase revenues faster than costs, which should have a positive impact on profitability.

Thirdly, the study concludes that average interest rates have a significant positive influence of profitability of commercial banks in Ethiopia. This indicates that a rise in average interest rates results to increase in bank profitability and vice versa. Rise in interest rates could cause an increase in interest income and eventually affecting revenue to banks.

Fourth, conclusion is that financial deepening has positive impact on profitability of commercial banks. This implies that when the economy becomes modern the banking industry will provide in modern and sophisticated way which lead to an increase of profitability.

Lastly, the study concludes that rise in exchange rate does not have significant influences in bank profitability (ROA). Because the p-value which is 0.7094 showed the impact of exchange rate on profitability of commercial banks is insignificant.

5.2 Recommendation

The findings of the study showed that GDP growth rate, inflation rate, average lending interest rate, inflation rate and financial deepening were the significant macroeconomics factors affecting commercial banks profitability during the study period (2002 to 2016). Hence, focusing and taking the necessary action on these indicators could lead to more profitability and make Ethiopian commercial banks competent internationally. Based on the findings of the study the following possible recommendations are forwarded:

Government should implement sustainable macroeconomic policies that will promote sustainable growth, business friendly and conducive environment that will enhance capacity utilization of industries so as to allow for high level of credit demand and absorption in the economy. Based on the study financial deepening (M2/GDP) has a positive impact on commercial banks profitability, because of these government and banks are advice to work together to enhance the banking sector development and to the modernization of the economy.

Banks operating in the sectors shall also examine the implication of the changes for example they have to be more accurate in predicting the future inflation for making the interest rate change accordingly to be benefited from the inflation, in general commercial banks should consider these macroeconomic factors how they could make more profit on their future growth and strategy.

Future Research Recommendations

This research study tries to examine the effect of selected macroeconomics factors on commercial banks profitability, but there is other macroeconomics factors which doesn't included in this study like per capital income, unemployment rate and I recommend researchers to conduct investigative study on the impact of such factors. The other recommendation is study on legal, regulatory and political factors on banking sector development.

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Appendices

Appendix –I Tests for the Heteroskedasticity Test:

White

Heteroskedasticity Test: White

F-statistic	0.556971	Prob. F(14,90)	0.8911
Obs*R-squared	8.371851	Prob. Chi-Square(14)	0.8691
Scaled explained			
SS	9.898598	Prob. Chi-Square(14)	0.7696

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 07/10/17   Time: 22:55

Sample: 2002 2016

Included observations: 105

Collinear test regressors dropped from specification

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.21355	18.76136	-0.544393	0.5875
EXCH^2	-0.011215	0.025751	-0.435512	0.6642
EXCH*GDP	-0.109330	0.156782	-0.697341	0.4874
EXCH*INFL	-0.013037	0.015979	-0.815851	0.4167
EXCH*LIR	-0.132384	0.190212	-0.695984	0.4882
EXCH*M2_GDP	-0.011173	0.008669	-1.288783	0.2008
EXCH	3.252436	4.742019	0.685876	0.4946
GDP^2	0.006022	0.008196	0.734680	0.4644
GDP*INFL	0.062461	0.062443	1.000290	0.3199
GDP*LIR	0.103453	0.142756	0.724688	0.4705
GDP*M2_GDP	0.011522	0.008365	1.377351	0.1718
GDP	-0.695234	0.700797	-0.992061	0.3238

INFL^2	0.006423	0.005896	1.089272	0.2789
INFL*LIR	-0.055543	0.053298	-1.042130	0.3001
INFL*M2_GDP	0.004424	0.003843	1.151154	0.2527

R-squared	0.079732	Mean dependent var	0.224632
Adjusted R-squared	-0.063421	S.D. dependent var	0.368125
S.E. of regression	0.379619	Akaike info criterion	1.032265
Sum squared resid	12.96993	Schwarz criterion	1.411402
Log likelihood	-39.19390	Hannan-Quinn criter.	1.185899
F-statistic	0.556971	Durbin-Watson stat	1.628561
Prob(F-statistic)	0.891075		

Appendix –II: Tests for the autocorrelation: Breusch-Godfrey

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.726604	Prob. F(4,95)	0.1505
Obs*R-squared	7.116075	Prob. Chi-Square(4)	0.1299

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 07/10/17   Time: 22:59

Sample: 2002 2016

Included observations: 105

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013866	0.663747	0.020890	0.9834
EXCH	-0.007587	0.020940	-0.362328	0.7179
GDP	-0.006594	0.015813	-0.416975	0.6776
INFL	-0.001738	0.006619	-0.262546	0.7935
LIR	0.015149	0.084654	0.178951	0.8584
M2_GDP	0.000800	0.012254	0.065298	0.9481
RESID(-1)	0.194303	0.106177	1.829993	0.0704
RESID(-2)	0.165901	0.106442	1.558594	0.1224
RESID(-3)	-0.075601	0.104441	-0.723858	0.4709
RESID(-4)	0.014065	0.106388	0.132209	0.8951

R-squared	0.067772	Mean dependent var	1.32E-15
Adjusted R-squared	-0.020544	S.D. dependent var	0.476227
S.E. of regression	0.481094	Akaike info criterion	1.464884
Sum squared resid	21.98787	Schwarz criterion	1.717642
Log likelihood	-66.90641	Hannan-Quinn criter.	1.567306
F-statistic	0.767380	Durbin-Watson stat	1.942860
Prob(F-statistic)	0.646613		

Appendix –III: Tests for Normality: Bera-Jarque test
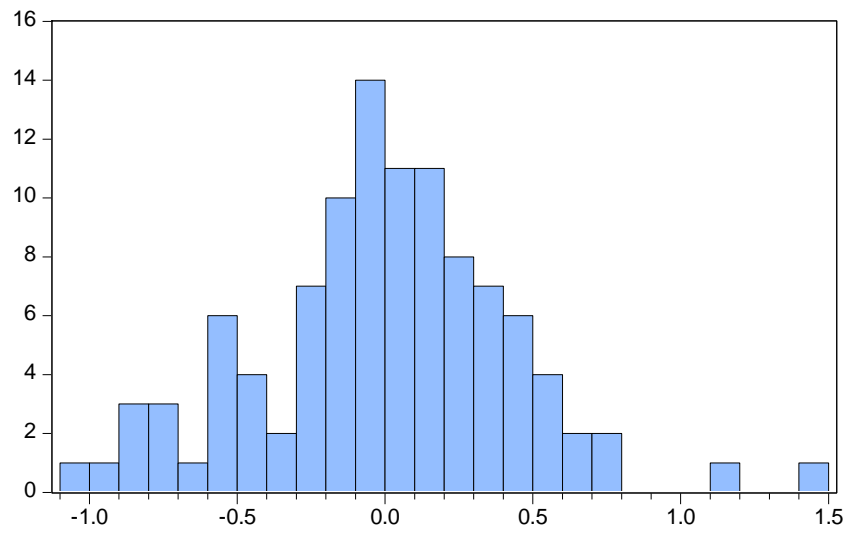
Series: Standardized Residuals	
Sample 2002 2016	
Observations 105	
Mean	6.34e-18
Median	0.007864
Maximum	1.426624
Minimum	-1.012489
Std. Dev.	0.430365
Skewness	0.078137
Kurtosis	3.791570
Jarque-Bera	2.848142
Probability	0.240732

Appendix –IV Descriptive statistics

	EXCH	GDP	INFL	LIR	M2_GDP	ROA
Mean	13.08933	9.166667	14.46667	11.22667	0.001333	2.638648
Median	10.40000	10.40000	10.60000	11.88000	3.200000	2.780000
Maximum	21.10000	12.60000	36.40000	12.75000	6.700000	4.200000
Minimum	8.540000	-2.100000	2.800000	9.250000	-16.70000	0.379000
Std. Dev.	4.804088	3.946802	9.738244	1.144948	6.511639	0.756774
Skewness	0.434634	-1.925867	1.176210	-0.758066	-1.273140	-0.824844
Kurtosis	1.473069	5.517549	3.210558	2.169244	3.670862	3.634583
Jarque-Bera	13.50626	92.63582	24.40469	13.07606	30.33447	13.66824
Probability	0.001167	0.000000	0.000005	0.001447	0.000000	0.001076
Sum	1374.380	962.5000	1519.000	1178.800	0.140000	277.0580
Sum Sq. Dev.	2400.243	1620.033	9862.673	136.3343	4409.751	59.56159
Observations	105	105	105	105	105	105

Appendix – VTests for multicollinearity: pair-wise correlation coefficients

	EXCH	GDP	INFL	LIR	M2_GDP	ROA
EXCH	1.000000	0.144907	-0.032287	0.693891	0.565557	0.422847
GDP	0.144907	1.000000	0.050738	0.490951	-0.132680	0.624693
INFL	-0.032287	0.050738	1.000000	0.303695	-0.526788	0.288957
LIR	0.693891	0.490951	0.303695	1.000000	0.058803	0.665414
M2_GDP	0.565557	-0.132680	-0.526788	0.058803	1.000000	0.022101
ROA	0.422847	0.624693	0.288957	0.665414	0.022101	1.000000

Appendix – VI: Tests for Model Specification: Ramsey Reset Tests

Ramsey RESET Test

Equation: UNTITLED

Specification: ROA C EXCH GDP INFL LIR M2_GDP

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.839735	98	0.4031
F-statistic	0.705156	(1, 98)	0.4031
Likelihood ratio	0.752819	1	0.3856

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.168502	1	0.168502
Restricted SSR	23.58637	99	0.238246
Unrestricted SSR	23.41787	98	0.238958
Unrestricted SSR	23.41787	98	0.238958

LR test summary:

	Value	df
Restricted LogL	-70.59075	99
Unrestricted LogL	-70.21434	98

Appendix – VII

Dependent Variable: ROA
Method: Panel Least Squares
Date: 07/10/17 Time: 07:18
Sample: 2002 2016
Periods included: 15
Cross-sections included: 7
Total panel (balanced) observations: 105

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.867484	0.618392	-1.402805	0.1640
EXCH	0.007319	0.019582	0.373784	0.7094
GDP	0.091803	0.014177	6.475305	0.0000
INFL	0.021004	0.006116	3.434433	0.0009
LIR	0.201744	0.078605	2.566558	0.0119
M2_GDP	0.021359	0.011565	1.846842	0.0680

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.676599	Mean dependent var		2.638648
Adjusted R-squared	0.638348	S.D. dependent var		0.756774
S.E. of regression	0.455106	Akaike info criterion		1.370636
Sum squared resid	19.26226	Schwarz criterion		1.673946
Log likelihood	-59.95839	Hannan-Quinn criter.		1.493543
F-statistic	17.68809	Durbin-Watson stat		1.873342
Prob(F-statistic)	0.000000			

Appendix – VIII

Table1. List of commercial banks in Ethiopia

No	Name of banks	Year of establishment
1	Commercial bank of Ethiopia	1942 G.C
2.	Awash international bank	1994 G.C
3	Dashen bank S	1995 G.C
4	Bank of Abyssinia	1996 G.C
5	Wegagen bank	1997 G.C
6	United bank	1998 G.C
7	Nib international bank	1999 G.C
8	Cooperative bank of oromia	2004 G.C
9.	Lion international bank	2006 G.C
10.	Zemen bank	2008 G.C
11.	Oromia international bank	2008 G.C
12	Buna international bank	2009 G.C
13	Berhan international bank	2009 G.C
14	Abay bank	2010 G.C
15	Addis international bank	2011 G.C
16	Debub global	2012 G.C
17	Enat bank S.C	2012 G.C

Source: - National bank of Ethiopia