Determinants of Profitability of Commercial Banks in Ethiopia: The Case of Selected Banks

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Statement of certification

This is to certify that Wondwossen Getachew has carried out this research work on the topic entitled “Determinants of profitability of commercial banks in Ethiopian: the case of selected banks” under my supervision. This work is original in nature and it is sufficient for submission for the partial fulfilment for the award of MSc. in Accounting and Finance.

Advisor Sewale Abate (PhD)

Signature_____

Date _____

Declaration

I declare that the thesis for the M.Sc. degree in accounting and finance at the University of Addis Ababa, hereby submitted by me, is my original work and have not previously been submitted for a degree at this or any other University, and that all references materials contained therein have been duly acknowledged.

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This is to certify that the thesis prepared by Wondwossen Getachew, entitled: *Determinants of profitability of commercial banks in Ethiopian: the case of selected banks* and submitted in partial fulfilment of the requirements for the Degree of Masters of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

The purpose of this study is to examine the effect of bank-specific and macroeconomic determinants of commercial bank profitability in Ethiopian. The study used panel data of seven commercial banks from year 2006 to 2016. The study employed an explanatory type of research and secondary financial data were used. Fixed effect regression model was applied to investigate the impact of bank size, capital adequacy, liquidity risk, management efficiency, loan to deposit ratio, funding cost, foreign exchange rate, GDP and inflation rate on profitability. Return on assets (ROA) was used as a measure of profitability. Based on the result of hausman specification test the study used fixed effect model. The major findings of the study show that liquidity risk, loan to deposit ratio, management efficiency and inflation have statistically significant and positive relationship with banks' profitability. Further, the results from the panel regression suggest that, funding cost and GDP have a negative and statistically significant relationship with banks' profitability. However, the relationship for capital adequacy, bank size and foreign exchange rate is found to be statistically insignificant. The study suggests focusing and redesign the firms together with significant key internal and external drivers of profitability of commercials banks in Ethiopia

Keywords: *Determinants, External Factors, Internal Factors, Profitability, Commercial Bank*

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List of Acronyms

AIB - Awash International Bank

BoA - Bank of Abyssinia

CAP - Capital adequacy

CBE - Commercial Bank of Ethiopia

CBE – Commercial Bank of Ethiopia

CLRM - Classic Linear Regression Methods

DB – Dashen Bank

FDC - Funding Cost

FER - Foreign Exchange Rate

GDP - Gross Domestic Product

INFL - Inflation

LBS - Bank Size

LIQ - Liquidity Risk

LTDR - Loan to Deposit Ratio

MGE - Management Efficiency

NBE - National Bank of Ethiopia

Nib – Nib International Bank

ROA Return on Asset

UB - United Bank

WB - Wegagen Bank

CHAPTER ONE

1. Introduction

1.1 Background of the study

If there is one thing without which trade and commerce cannot survive, it would be finance (Tariq et al. 2014). In a given country's economic system, finance plays a vital role in the circulation of funds (Ongore,2013). Financial institution contributes to economic growth of the country by making funds available for investors to borrow as well as financial deepening in the country (Otuori, 2013). According to Samuel (2015, p. 1), commercial banks in Ethiopia are the backbone of the country's financial system.

According to Arora (2014, p. 104), the importance of banks originates from their role as main channels of savings and allocators of credit in an economy. Arora further noted that emerging economies depend on an efficient banking sector to grow fast. In a similar vein, Leykun and Sharma (2017, p. 14) pointed out that banks play a key role "in improving economic efficiency by channeling funds from resource surplus unit to those with better productive investment opportunities". Their latest article on the Determinants of Banks' Profitability makes it clear that banks also have another key role in trade and payment system in that it reduces transaction costs and increases convenience. In less monetized countries, like Ethiopia, whilst financial sector is dominated by banking industry, effective and efficient functioning of the Banks has significant role in accelerating economic growth (Berhanu, 2015).

In the course of playing the aforementioned roles, banks discharge a variety of functions on the day-to-day routines. The functions of commercial banks of Ethiopia is clearly stated at Art 2 sub Article 2 of the Banking Business Proclamation No 592/2000 presented that, the major function of bank is collecting deposits, Buying and selling of foreign-exchange, provide loan and money transfer service. In addition, banks render Over-Draft, and agency services.

Needless to say, the bank sector is expected to generate profit in order to sustain in the market for long, which is termed as profitability. Lartey et al. (2013) cited in Anarfi, Abakah, and Boateng, (2016, p. 195) defined bank profitability as "the ability of a bank to generate revenue in excess of cost, in relation to the bank's capital base."

According to Saona (2011), cited in Rahman, Hamid and Khan (2015, p. 135), where there is an efficient financial system, there will always be an increase in banks' profitability as a result of increased amount of funds available for investment, while enhancing the quality of services provided for the customers. Without achieving enough profitability, Abel and Roux (2016, p. 885) observe, the banking sector does nothing but consume its own capital and risks its existence. This undermines the banks' ability to serve as a major means of national development.

However, bank profits are not the results of a single factor. The factors, as pointed out in a variety of literature, are commonly divided into two major categories. The first category looks at the bank-specific or internal factors that are controllable by the management of a given bank. The second category, on the other hand, looks at factors that are beyond the control of the management and usually referred to as external or macro-economic factors (Ermias, 2016).

Accordingly, Samuel (2015, p. 1) stated that profitability is a reflection of how banks are run, given the environment in which they operate. More specifically, bank profitability should reflect the quality of a bank's management and the shareholder's behavior, the bank's competitive strategies, efficiency and risk management capabilities (Aburime, 2008).

Looking back at the history of banking in Ethiopia, one would understand that the sector is about a hundred years old starting from Minilik II's era (Alemayehu, 2006). The sector had gone through various changes along with the change in the system of government from Minilik to Haileselassie and from Mengistu to the current regime. As the environment in which the banks operated changed, their profitability changed too (Berhanu, 2015).

Currently, about 18 banks are operating in the industry. This figure includes one public commercial bank and 16 other private banks. In addition, the government operated development bank of Ethiopia is another public bank in the list. Aderaw and Singh (2016, p. 9) asserted that the financial industry in Ethiopia is dominated by public banks in general and commercial bank of Ethiopia (CBE) in particular.

Financial statements of both public and private banks operating in Ethiopia reveal that their profitability is increasing from year to year. A number of researches have examined the factors that contributed to or that determined the profitability of the banks. As both the internal and

external environments in which the banks operate change from time to time, so do the factors that result in profitability.

Hence, the current research attempts to examine the factors that determine the commercial bank profitability. The research looked at seven selected commercial banks based on their annual financial report and that have been operating at least since 11 years ago. This is owing to the fact that the research covers a period of 11 years from 2006 – 2016

1.2 Statement of the Problem

Profit in the banking industry fluctuates overtime having its ripple effect on economic growth, this calls attention to profitability variables (return on capital employed, return on asset, and return on equity) in banks and their effect on economic growth (Adekola, 2016, p.2).

The researcher has reviewed various researches that examined determinants of commercial bank profitability in Ethiopia. For instance, study conducted by Amdemichael (2012), Gemechu (2016), Birehanu (2012), Samuel and (2015) tried to examined the determinants of Ethiopian commercial banks profitability by using the variable of capital adequacy, bank size, liquidity, management efficiency, loan and advances, market concentration, employs efficiency funding cost, operating efficiency, GDP, inflation and exchange rate as bank specific, industry specific and macroeconomic variables.

Accordingly, the emphasis of this research is to examine the main determinants of Ethiopian commercial banks profitability (bank-specific and macroeconomic) by adding variables loan to deposit ratio as a determinant of profitability which are not included in previous study. Thus, this paper seeks to fill the gap by providing the full information about the internal and external factors that affect the profitability of the seven commercial banks in Ethiopia: for a period from 2006 to 2016.

1.3 Objectives of the Study

1.3.1 General Objective

The major objective of the study is to examine factors that determined commercial bank profitability in Ethiopia.

1.3.2 Specific Objectives

More specifically, the study attempt to:

1. To explores the major internal factors that determine the commercial banks profitability in Ethiopia;
2. To evaluate the effect of macroeconomic (external factors) on the profitability of commercial banks in Ethiopia;
3. To identify the relationship between independent variables and dependent variables and;
4. To realize which bank profitability theory best explains the finding of this research;

1.3.3 Research questions

Based on the objectives, the research provides answer for the following research questions:

1. What are the internal factors that determine the profitability of commercial bank in Ethiopia?
2. Which macroeconomic factor affects commercial banks' profitability?
3. How does bank size affect commercial banks' profitability?
4. What is the relationship between loan to deposit ratio and profitability?
5. What is the effect of liquidity risk on commercial banks' profitability?
6. What is the relationship between funding cost and profitability?
7. What is the relationship between management Efficiency and profitability?
8. What is the relationship between inflation and profitability?
9. How does GDP affect commercial banks' profitability?
10. What is the relationship between eexchange rate and profitability?
11. What is the relationship between capital adequacy and profitability?

1.4 Hypotheses

The following hypotheses are formulated based on the internal and external factors that determine bank profitability to be taken into account in this study. The hypotheses of the study are derived from literature. Accordingly, the study attempt to test the following major hypotheses:

HO1: Bank size has positive and significant effect on bank profitability.

HO2: Capital Adequacy has positive and significant effect on bank profitability.

HO3: Liquidity risk has negative and significant effect on bank profitability.

HO4: Loan to deposit ratio has negative and significant effect on bank profitability.

HO5: Management efficiency has positive and significant effect on bank profitability.

HO6: Funding cost has negative and significant effect on bank profitability.

HO7:Real gross domestic product has positive and significant effect on bank profitability.

HO8: Inflation rate has positive and significant effect on bank profitability.

HO9: Foreign exchange rate has positive and significant effect on bank profitability.

1.5 Significance of the study

The study is expected to serve as additional reference on the issue of bank profitability for the existing researches are insufficient. The banks under study would benefit from this research in that it provides analyses on how they are functioning and what they should do in the future. Last, but not least, researchers used it as a source of reference for further studies on the area in the future.

1.6 Scope of the Study

The study carried out on financial data of seven selected commercial banks in Ethiopia. The researcher tried to look into their profitability and see how these internal and external factors have an impact on these banks in the period of 2006-2016 (11years). The idea is to investigate empirically the factors and study how they affect the profitability of these commercial banks in Ethiopia within that period.

1.7 Organization of the Study

The organization of the rest of the paper is as follows. In section 2, the empirical research on banks' profitability is reviewed by presenting findings of research. Section 3 introduces the research design and methodology. The data analysis and discussion of results described in section 4. In section 5, presents the conclusion and recommendation of the regression analysis described in section 4

CHAPTER TWO

2. Literature Review

This chapter presents the theoretical framework, review of empirical studies and the various determinants of bank profitability. The theoretical framework focuses on theories that explain the relationship among the variables considered important to the study. Review of empirical studies is about past and present studies that have been done on the area of study. Determinants of bank profitability explain how the macroeconomic and bank specific variables influence the profitability of banks in Ethiopia.

Theoretical and Conceptual Literature Review

2.1 Review of Relevant Theoretical Models

Theoretical models refer to the theories that can describe philosophy related to the research and it helps to form link between theoretical aspects and practical applications. This section will explain theorized relationship between variables, so that it can provide a foundation to develop the proposed theoretical or conceptual framework. Based on previous studies, there are numerous theoretical models used to explain the theoretical relationship between capital adequacy, funding cost, bank size, loan to deposit ratio, management efficiency, GDP, inflation, foreign exchange rate and bank profits.

Bankruptcy Cost Theory (1958)

Aremu, Ekpo & Mustapha (2013) suggest that "Bankruptcy Cost Theory" explain the positive link between capital adequacy and profitability. If the bankruptcy costs are unexpectedly high due to the environmental changes, banks will need to hold more equity and increase their capital ratio in order to reduce the expected value of bankruptcy cost and avoid financial distress.

Economies of Scale Hypothesis

"Economies of Scale Theory" suggests that large corporations are able to gain cost advantage when they produce outputs. This means when the scale of output is increased, average cost per unit will reduced. Identically, economies of scale explain the positive relationship between bank size and

profitability. According to Bashir (1999), large bank is able to benefit from economies of scale as large bank is able to reduce cost of gathering and processing information which ultimately increased profitability.

Efficiency Theory

The efficiency theory was formulated by Demsetz (1973). The efficiency theory supports that the most favorable production can be attained through economies of scale. Thus, maximum operational efficiency in the short run is achieved at a level of output where all economies of scale available are being employed in an efficient manner (Odunga et al., 2013). Additionally, the efficiency theory explains that attaining higher profit margins arises from efficiency which allows banks to obtain both good financial performance and market shares (Mirzaei, 2012). "Efficiency Structure Theory" also suggest that banks able to earn higher profits if they are efficient than others. Efficient structure hypothesis suggests that large banks have superior management and production technologies which able to lower down operational costs, therefore earned higher profits when compared to small banks (Soana, 2011). The efficiency hypothesis prevails when a positive significant correlation between profitability and the market share is signaled (Mensi & Zouari, 2010).

Risk return Hypothesis

According to Olweny & Shipho (2011), "Risk-Return hypothesis" explained negative relationship between capital adequacy and profitability. When a bank decides to take up more risk to achieve higher expected returns, the bank will increase leverage or debt in order to boost up profitability. This suggests that if a bank intends to increase leverage, then the bank will need to reduce the equity-to-asset ratio (capital). Thus, this theory explained capital adequacy can be negatively linked to banks profitability due to that bank prefers to use leverage rather than equity.

Capital Asset Pricing Model (CAPM)

A capital asset pricing model provides a relatively accurate prediction of the relationship that exists between a financial risk and the expected return (yield). The expected return on a firm's stock is defined as a function of risk-free rate and a premium based on the systematic risk (Samuel, 2015). This model evaluates the amount of compensation that the investor needs for taking of additional risk.

Anghel and Paschia (2013, p.542) points out that CAPM, which was developed by Sharpe (1964), comes from fluctuations in securities that are affected by two factors which are (1) changes in the general index of the stock exchange and (2) the specific changes to the issuing companies. They asserted that "in this respect, it is considered that the total variance of a financial basis is due to simultaneous action of two broad categories of risks, namely: - Systematic risk (market risk, not diversifiable) and specific risk".

Kutsienyo (2011, p. xxiii), on his part, identified the underlying logic behind CAPM model as the fact that "CAPM views the total portfolio risk as a function of systematic risk and unsystematic risk". The systematic risk, according to Kutsienyo, is pertinent to factors that have influence on the market as a whole. These factors can include government policies, the economy condition and the political climate. The unsystematic risk, on the other hand, has to do with specific characters limited to a particular company. These factors include management qualities and employees' efficiency.

Return on Assets (ROA) proxy

Return on assets (ROA) is used as a proxy to measure profitability of a bank; it is a ratio of total net income to total assets. Golin (2001) concludes that ROA is the key measure of profitability for banks. Furthermore, the studies conducted by Samuel (2015) in Ethiopia, Bami (2014) in Ghana, Obamuyi (2013) in Nigeria and Kosmidou (2008) in Greece. In line with Obamuyi (2013), Ben Naceur and Goaied (2008) they found that ROA is better than ROE because ROA shows the profits earned per unit of asset which reflects bank's ability in utilizing the financial and real assets to generate profits, whereas ROE has neglects financial leverage. Also, Sufian & Chong (2008) pointed out that ROA depends on the bank's policy decisions as well as on uncontrollable factors relating to the economy and government regulations. Rivard and Thomas (1997) suggest that bank profitability is best measured by ROA in that ROA is not distorted by high equity multipliers and ROA represents a better measure of the ability of a firm to generate returns on its portfolio of assets.

The drawback of using ROE also emphasized by Bashir (2003), he revealed that ROE is the ratio of total net income to total equity; this indicates that ROE only reflects how effectively a bank in utilizing shareholders' funds to generate profits, but it disregards the financial leverage or debt. In

other words, high ROE does not mirror high profit in a bank, because high ROE might due to the lower capital or equity. ROE only shows how shareholders' funds being used to generate profits, but it do not take into account of liabilities such as borrowed funds and bonds, thus ROA is better since its denominator is total assets which already incorporated the liabilities and equity. This is also supported by Davydenko (2010); he mentioned that high ROE means low level of capital, resulting in high level of financial leverage which is undesirable and associated with high degree of risk. He further added that ROE is not optimal to measure bank's profitability since the level of capitalization is often determined by regulators.

On the other hand, some researchers argue about using ROA as an indicator of bank's profitability. Alexiou & Sofoklis (2009) argue that ROA may be biased since it excludes the off-balance-sheet activities. Likewise, Goddard, Molyneux & Wilson (2004) used ROE as an indicator to study bank's profitability as they argue that off balance-sheet activities make significant contribution of profits to the European banks, thus ROE is more appropriate to be used.

2.2 Empirical Literature Review

The analysis of the literature emphasizes the existence of a significant number of empirical studies that focused on investigating the factors that impact the bank profitability.

2.2.1 Single country studies

Sufian and Chong (2008) pointed out the determinants of Philippines banks profitability during the period 1990–2005. The empirical findings showed that all the bank-specific determinant variables had a significant impact on bank profitability. Also, the empirical findings suggested that size, credit risk, and expense preference behavior are negatively related to banks profitability, while non-interest income and capitalization had a positive impact. Furthermore, the results showed that inflation had a negative impact on bank profitability, on the other hand the impact of economic growth, stock market capitalization and money supply had not significantly explained the variations in the profitability of the Philippines banks.

In addition, Ponce (2012) also analyzed the factors that determine the profitability of Spanish banks for the period of 1999–2009. The study used ROA as a profitability measure. The empirical findings showed that the high bank profitability during these years is related with a large percentage of loans in total asset, an increase of customer deposits and good efficiency and low

credit risk. Also, the findings provided that there is no evidence of either economies or diseconomies of scale existing in the Spanish banking sector. Moreover, all industry as well as macroeconomic determinants, with the exceptions of interest rate, affected banks profitability in anticipated ways.

Flamini et al. (2009) studied the determinants of bank profitability for a sample of 389 banks for the period 1998-2006. The paper supposed that higher returns on assets are correlated with larger bank size, activity diversification, and private ownership. Moreover, Bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth do boost credit expansion Therefore, and the study emphasized the policy of imposing higher capital requirements in the region in order to strengthen financial stability.

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 showed that only real interest rate is positively related with profitability in regards to macroeconomic variables. Furthermore, the empirical findings recommended that through increasing bank size and none interest income and decreasing credit to asset ratio banks can get better profitability. Moreover, higher interest rate can lead to higher bank profitability.

Antonio Trujillo-Ponce (nd, 5) writes that previous studies have categorized the factors determining the profitability of banks into two main groups. In the first category fall, Trujillo-Ponce points out, determinants of profitability that are bank-specific and that arise from managerial decisions such as asset structure, asset quality, capitalization, financial structure, efficiency, size, and revenue diversification. The second group of the determinants includes factors that are related to the financial industry and the macroeconomic environment in which the banking sector operates. These factors include industry concentration, economic growth, inflation, and interest rates.

Vong et al., (2009) examined the impact of bank characteristics as well as macroeconomic and financial structure variables on the performance of the Macao banking industry. It was demonstrated that the capital strength of a bank is of paramount importance in affecting its profitability. This result is in line with that of Sufian (2009)

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. Both of them, originated that better capitalized banks, a comparatively larger share of deposits, and more X-efficient banks tend to be more profitable. Thus, a less concentrated banking system and a lower government intervention increase bank profitability. Moreover, from the macroeconomic variables studied, higher real interest rates on loans and inflation appear to increase profitability while the volatility of interest rates reduces it.

Kosmidou (2008) using unbalanced pooled time series data studied the factors that influence the performance of banks in Greece from the year 1990 to 2002. The research established that more return on average assets was connected to highly capitalized commercial banks and low cost to income ratios. The research revealed that size of the bank had a positive but statistically significant in combination with financial structure and macroeconomic variables. The research established that growth of gross domestic product significantly and positively influenced profitability whereas inflation has a negative and statistically significant negative effect on banks' profitability.

Athanasoglou et al. (2005) pointed out, the internal and external determinants of bank profitability on Greek banks for the period 1985-2001 by implementing the Generalized Method Moment (GMM) technique. They found out that the empirical outcomes of the regression are tied to bank-specific and macroeconomics determinants. The results show that all the bank-specific tested affect bank profitability significantly with the exception of the total asset or so-called bank-size. For instance, a bank with a sound capital which is important in explaining bank profitability is competent to engage effectively in business opportunities, though unexpected losses can occur on the way but still it could achieve a high chance on being profitable. Some of the bank-specific and industry-specific variables have insignificant impact on profitability but due to the efficient ability of the Greek banks, their management is able to overcome such inconsequential matters. Moreover, the macroeconomics variables; inflation and cyclical output have a positive impact on profitability.

The study conducted by Alexiou et al. (2009) was to identify the crucial factors that affected the profitability of the six major Greek commercial banks by using Panel data analysis over the period 2000– 2007. In this case, ROA and ROE were the dependent variables while bank capital, credit risk, bank size, liquidity risk, operating cost, inflation rate, interest rate, GDP, private consumption and investment were the independent variables. Macroeconomic factors such as inflation and

private Consumption appear to play a significant role in shaping the performance of banking institutions. Additionally, bank-specific variables, such as capital or measures of cost-efficiency, also play a critical role in determining bank profitability.

Weersainghe and Ravinda (2013) pointed out the impact of bank specific such as Bank Size, Liquidity Risk, and Operating Cost, Capital adequacy, Credit Risk and macroeconomic determinants like GDP growth rate and Interest Rate on the profitability of commercial banks in Sri Lanka by using quarterly data relating to the bank specific and macroeconomic indicators during the period 2001-2011 and carrying out a multiple panel regression. Moreover, they used ROA and ROE as profitability indicator. According to the empirical results, it was observed that the large banks are recorded more profits due to economic of scale than the banks which are well sound with a higher regulatory capital ratio. Further, the results from the panel regression suggest that the liquidity and operating cost efficiency banks were negatively related to the commercial banks profitability in Sri Lankan. In addition, interest rate found to be having a significant impact on the bank profitability with a negative relationship between the Return on Assets of a bank.

Aburime (2008) investigated the determinants of bank profitability in Nigeria, using a panel data from 1980-2006. He found that real interest rates, inflation, monetary policy, and exchange rate regime are significant macroeconomic determinants of bank profitability in Nigeria, while banking sector development, stock market development, and financial structure are insignificant.

2.2.2 Panel country studies

Athanasoglu et. al. (2006) examined the Determinants of Bank Profitability in the South Eastern European Region over the period of 1998-2002. The study used unbalanced panel dataset of seven SEE countries (Bulgaria, Croatia, Albania, Bosnia-Herzegovina, FYROM, Serbia-Montenegro and Romania) and employed random effect model (REM) regression to test the analysis. It was discovered that inflation has a strong impact on bank profitability in those countries, whilst real per capita income doesn't show any significant impact due to small sample period.

Molyneux and Thornton (1992) examined the determinants of bank profitability on a set of countries. They use a sample of 18 European countries during the 1986-1989 periods. They found a significant positive association between the return on equity and the level of interest rates in each country, bank concentration and government ownership.

Abreu and Mendes (2002) investigated the determinants of bank's interest margins and profitability for some European countries in the last decade. They report that well capitalized banks face lower expected bankruptcy costs and this advantage "translate" into better profitability. Although with a negative sign in all regressions, the unemployment rate is relevant in explaining bank profitability. The inflation rate is also relevant.

Bashir (2000) on his side examined the determinants of Islamic bank's performance across eight Middle Eastern countries for 1993-1998 periods. Controlling for macroeconomic environment, financial market situation and taxation, the results show that higher leverage and large loans to asset ratios, lead to higher profitability. Additionally, the study explained that foreign-owned banks are more profitable that the domestic one. There is also evidence that taxation impacts negatively bank profitability. Finally, macroeconomic setting and stock market development have a positive impact on profitability.

Pasioras and Kosmidou (2007) examined the effects of 10 internal and external variables on profitability, including the capital ratio, cost to income ratio, loans to customers and short-term funding, bank size, inflation, GDP growth, concentration, and three determinants reflecting the development of banking and stock markets on bank return for 584 domestic and foreign commercial banks in the 15 developed European Union countries measured for the period 1995-2001. The impact of all variables was found to be statistically significant except for the concentration ratio.

Ben Naceur and Omran (2011) revealed the influence of bank regulations, concentration and financial and institutional development on the Middle East and North Africa countries commercial bank's margins and profitability during the period 1989-2005. They found that bank capitalization and credit risk had a positive impact on banks „net interest margins, cost efficiency and profitability. On the other hand, macroeconomic and financial development indicators had no significant impact on bank performance

Goddard et al. (2004) investigated the profitability of European banks during the 1990s using cross-sectional, pooled cross-sectional time-series and dynamic panel models. They use cross-sectional and dynamic panel estimation to investigate selected determinants of profitability in six major European banking sectors: Denmark, France, Germany, Italy, Spain and the UK, for the

period 1992–98. Models for the determinants of profitability incorporate size, diversification, risk and ownership type, as well as dynamic effects. Despite intensifying competition there is significant persistence of abnormal profit from year to year. The evidence for any consistent or systematic size–profitability relationship is relatively weak. The relationship between the importance of off-balance-sheet business in a bank's portfolio and profitability is positive for the UK, but either neutral or negative elsewhere. The relationship between the capital–assets ratio and profitability is positive.

2.3 Review of previous studies on Ethiopia

Few studies were appearing on the determinants of commercial bank profitability in Ethiopia by taking different internal and external variables taken into account. Most literatures that are examined in this study used a number of banks specific, industry specific and macroeconomic factors as a determinant of banks profitability

Amdemikael (2012) investigated Factors Affecting Profitability on Ethiopian Banking Industry. This study examines the bank-specific, industry-specific and macro-economic factors affecting bank profitability for eight commercial banks operating in Ethiopia, covering the period of 2000-2011. He adopts a mixed research approach by combining documentary analysis and in-depth interviews. He used ROA as a dependent variable and capital strength, operational efficiency, income diversification, liquidity risk, bank size, asset quality, industry concentration level, real GDP growth and inflation as independent variables. The findings of the study show that capital strength, income diversification, bank size and gross domestic product have statistically significant and positive relationship with banks' profitability. On the other hand, variables like operational efficiency and asset quality have a negative and statistically significant relationship with banks' profitability. However, the relationship for liquidity risk, concentration and inflation is found to be statistically insignificant.

The study carried out by Samuel Alemu (2015) analyzed that the determinants of commercial banks profitability in Ethiopia by using 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 on banks profitability and also

primary data was used to support the result of the documentary analyses. 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.

Habtamu (2012) examined the determinants of Ethiopian private commercial banks profitability in Ethiopia by using panel data of seven private commercial banks from year 2002 to 2011. He 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). He applied Fixed effect regression model 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. Beside this, he used primary data analysis to solicit mangers perception towards the determinants of private commercial banks profitability. The empirical results show 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.

The main objective of the study made by Birhanu (2012) is to examine the effect of bank specific, industry-specific and macroeconomic determinants of Ethiopian commercial banking industry profitability from the period 2000 – 2011 by using OLS estimation method to measure the effects of internal and external determinants on profitability in terms of average return on asset and net interest margin. The result reveals that, all bank-specific determinants, with the exception of bank size, expense management and credit risk, affect bank profitability significantly and positively in the anticipated way. However, bank size, expense management and credit risk affect the commercial banks profitability significantly and negatively. In addition to this, no evidence is found in support of the presence of market concentration. Finally, from macroeconomic determinants GDP has positive and significant effect on both assets return and

interest margin of the bank. But interest rate policy has significant and positive effect only on interest margin.

Melaku (2016) investigated the determinants of bank profitability in Ethiopian private banks using secondary data. The study employed audited financial statements of six sampled private commercial banks for the period of 2004 to 2011.The study used return on assets (ROA) as dependent profitability variable. Moreover, the study used both bank specific and external variables as explanatory variables. Both descriptive statistics and econometrics model specifically fixed effects estimation were used to analyze the relationships of profitability variable with explanatory variables. The major findings of the study showed that bank specific determinants were very important in explaining profitability than external variables. The Asset size, capitalization, labor productivity, liquidity and non-interest income were positively and significantly related to bank's profitability, whereas credit risk and overhead efficiency have a negative impact on profitability of bank specific drivers.

Gemechu (2016) examined determinants of banks' profitability: evidence from banking industry in Ethiopia. The study applied balanced panel data of eight Ethiopian commercial banks that covers the period of 2002 - 2012. Ordinary least square (OLS) estimation technique used to see the impact of determinants on profitability of Ethiopian commercial banks. The findings of the study revealed that all bank specific determinants except credit risk and expense management have statistically significant and positive relationship with banks' profitability. On the other hand, variables like credit risk, expense management and regulation have a negative and statistically significant relationship with banks' profitability. All macroeconomic determinants in this study like economic growth, interest rate spread and exchange rate have statistically significant and positive relationship with banks' profitability

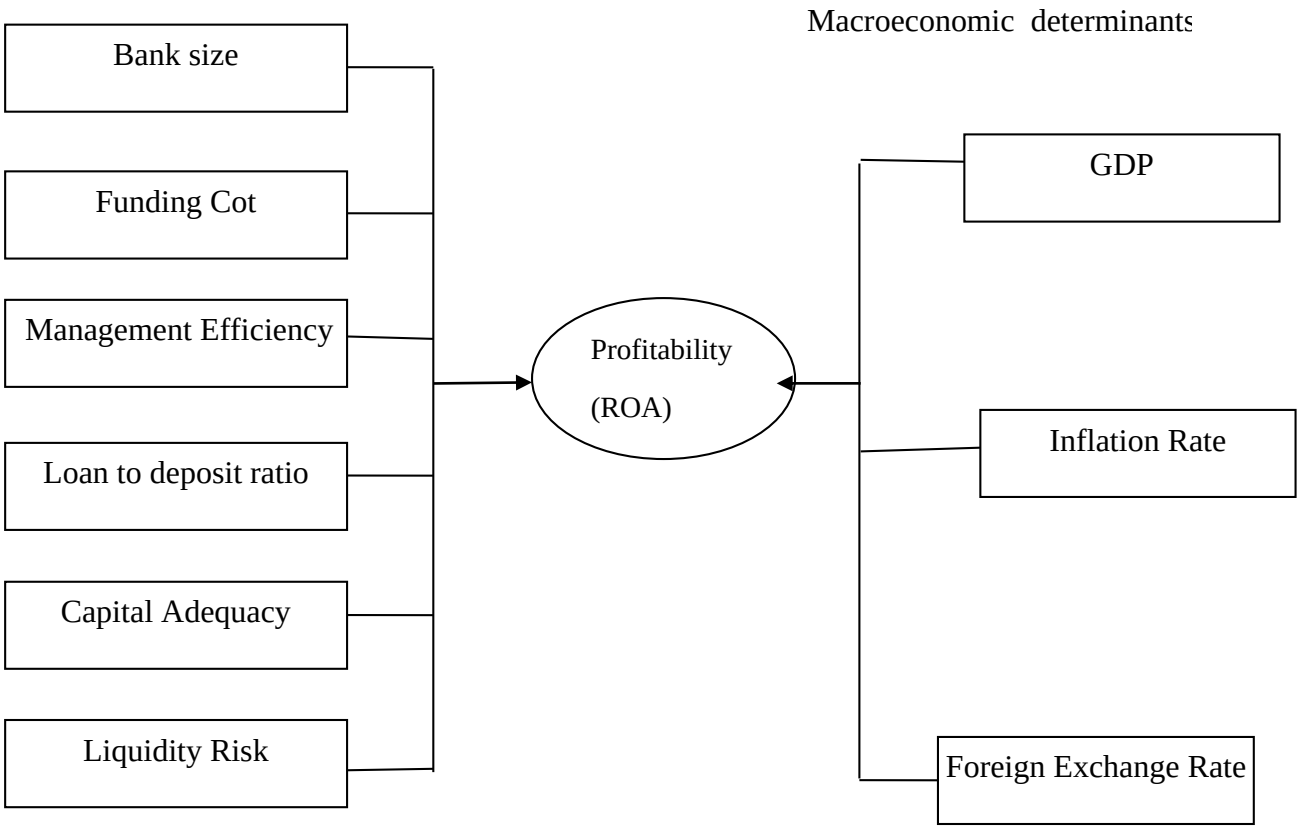
2.4 Conclusion and knowledge gap

Overall, empirical review for this research provides back ground information of commercial bank profitability. Most of the research works were not following the regulatory standards to identify the various internal factors that determine the performance of banks. The frameworks used to identify internal determinants sometimes vary with the regulatory rating standards. Also the financial ratios to be used for measuring performance are not in line with the regulatory organ. For

instance, the loan to deposit ratio which is used as the measure of liquidity in literature is not similar with liquid asset to total ratio standard set by the regulatory organ. Therefore, the objective of this study is to examine the factors that determine bank profitability in Ethiopia and to fill the knowledge gap that exists in the area by incorporating and testing a new variable loan to deposit ratio (loan divided by deposit) which is not tested by prior Ethiopian researchers.

2.5 Conceptual Framework

A conceptual framework depicts a relation that exists between study variables. The study seeks to identify determinants of banks profitability hence independent variables will include banks size, capital adequacy, liquidity, loan to deposit ratio, management efficiency, funding cost, GDP, inflation rate and foreign exchange rate. The dependent variable will be profitability.



Source: author's self-conceptualization

Figure 2. 1 Relations between profitability and its determinants

CHAPTER THREE

3. Research Design and Methodology

3.1 Research Design

This study has employed explanatory type of research design to establish causal relationship between variables. The researcher has used panel data (both time series and cross sectional data) of seven commercial banks operating in Ethiopia. To examine the impact of independent variables (size, loan to deposit ratio, liquidity, capital adequacy, funding cost, inflation, GDP and exchange rate) over the dependent variable (Return on Asset) for the period 2006-2016.

3.2 Population and Sampling Techniques

The target population of this study included all commercial banks registered by NBE and operating in Ethiopia. According to NBE 2015/16 reports, currently, the number of banks declined to 18 from 19 due to the merger of Construction & Business Bank with Commercial Bank of Ethiopia. Of the 18 banks 16 were private and 2 publics. However, because of lack of 11years' data that is required for the analysis purpose, banks which started their operation after 2006 are excluded from the study. As a results, the numbers of sample banks is reduced to seven.

The study employed non-probability purposive sampling technique based on the age and accessibility of complete audited financial statements. The rationale behind selecting purposive sampling techniques than others is, it considered more appropriate when the universe happens to be small and a known characteristic of it is to be studied intensively.

3.3 Data source and collection methods

In order to achieve the research objectives mentioned section 1.3, the study used audited financial statements. The data set used cover a period of 10 years starting from 2006 to 2016, involving of seven commercial banks in Ethiopia (CBE, AIB, DB, WB, BoA, UB, and NIB for 11 consecutive years. The study employed secondary data. The secondary data were collected from annual reports and audited financial statements of the selected sample banks. Regarding macroeconomic data mainly gathered from the records held by NBE through structured document review. The website of each of the banks also visited to collect necessary data for the study.

3.4 Methods of Data analysis

The collected panel data were analyzed by using descriptive statistics, correlations, and multiple linear regression analysis. The secondary data was analyzed by using E-views 8 for windows software package. Basically, descriptive statistical tools were used to analyze the mean, standard deviation, minimum and maximum values of the study.

Before undertaking any manipulations of the data, the study computed the descriptive statistics and correlation matrices for all banks in the sample, since correlation analysis were used to select the variables which entered in the econometrics model and also check for multicollinearity of the data.

3.5 Model Specification

From the research methodology, the model was containing Return on asset (ROA) indictors of commercial banks profitability as the dependent variables; the explanatory variables include gross domestic product (GDP), inflation rate (INR), exchange rate (FER), bank size (LBS), capital adequacy (CA), loan to deposit Ratio (LTDR), liquidity risk (LIQ), funding cost (FDC), and management efficiency (MGE)were the independent variables. Hence, based on the relationship among the above stated bank profitability indictors and bank-specific as well as macroeconomic determinants, the following functional forms serve as the basis for the investigation:

ROA=f (LBS, CA, LIQ, LTDR, MGE, GDP, FDC, FER, INR) ---------- (1)
Equation 1, 2 and3 can be transformed into an econometric model as follows:

$$\mathbf{ROA}_{i,t}=\beta_0+\beta1(LBS)i,t+\beta2(CA)i,t+\beta3(LIQ)i,t+\beta4(LTDR)i,t+\beta5(MGE)i,t+\beta6(GDP)i,t+\beta7FDC+\beta8FER+\beta9INR+\varepsilon$$

Where:

ROA*i,t* is the dependent variable as a proxy for bank's profitability, for bank *i* at time *t*.

β0 - constant
β1-9 – coefficients of the regression model
ε – Error term

3.5.1 Model Assumptions and Data properties

The following diagnostic tests were carried out to ensure that the data fits the basic assumptions of linear regression models;

Normality Test

Normality test was carried out to verify if the error terms are normally distributed. The Jacque-Bera (JB) test was employed to ascertain this assumption. The test was based on the null hypothesis that the residuals are normally distributed.

Autocorrelation Test

Autocorrelation or serial correlation refers to the case in which the error term in one time period is correlated with the error term in any other time period. The study employed the Durbin-Watson test. This test conducted based on the null hypothesis of no serial correlation.

Multicollinearity Test

Detection was by matrix correlation among independent variables. According to Gujarati (2004), the rule of thumb is that if the pair-wise correlation coefficient between two repressors is high, in excess of 0.8, then multicollinearity is a serious problem.

Heteroscedasticity Test

Heteroscedasticity occurs when the variance of the error term is not constant. The study employed popular White's heteroscedasticity Test. Gujarati (2004) asserts that the general test of heteroscedasticity proposed by White does not rely on the normality assumption and is easy to implement. The test based on the null hypothesis that the variance of the errors is constant (homoscedacticity)

3.6 Definition of Variables and Construction of Hypotheses

3.6.1 Dependent variables

Various researchers have employed different Bank profitability proxy measures to determine the factors affecting banks' profitability. For instance, we looked the authors and their measure of profitability that employed includes: return on assets (Flamini et al,2009; Kosmidou,2008, Samuel, 2015), return on equity (Hoffmann, 2011); return on assets and return on equity (Athanasoglou et al., 2006;Abel& Roux, 2016, Aminu, 2013,Alper Anbar, 2011), return on assets and net interest

margins (Gemechu, 2016; Naceur 2003, Birehanu, 2012); return on assets, return on equity and net interest margins (Sufian,& Habibullah,2009; Naceur &Omran, 2011).

In this study, bank profitability, typically measured by the return on assets (ROA), as a function of internal and external determinants.

Return on Asset (ROA)

Return on asset is one of the major proxies of the profitability of banks that indicates how capable the management of the bank has been in converting Assets into net earnings. Net profit after tax divided by total assets considered to estimate ROA for this particular study. (Akbas, 2012). Bank profitability is best measured by ROA, because it represents the best measure of the ability of a firm to generate returns on its portfolio assets (Kosmidou, 2008; Naceur and Goaied, 2008). ROA indicates the profit earned per unit asset and which is most important, it shows the management's ability to utilize the banks financial and real investment resources to generate profits. As Golin (2001) points out, the ROA has emerged as a key ratio for the evaluation of bank profitability and has become the most common measure of bank profitability in the literature. Therefore, ROA is considered as more significant and a better profitability measure and dependent variable.

3.6.2 Independent variables

Size

Natural logarithm of book value of total assets is used as a proxy to measure bank size and this proxy is able to capture the possible cost advantages related with the size (Sufian & Chong, 2008). Bank size is usually used to explain for potential economies or diseconomies of scale in the banking sector. Furthermore, bank size is associated with diversification which may impact favorably on risk and product portfolio. Economies of scale will reduce the cost of gathering and processing information (Boyd et al., 1993) so that a positive effect of bank size is associated with profitability. Also, the empirical researches conducted by Alper & Anbar (2011) in Turkey and Alexiou & Sofoklis (2009) in Greek found that bank size positively related to bank's profitability. They explained that the positive relationship between bank size and bank's profitability evidenced that larger bank can achieve economies of scales.

HP1*: Bank size has positive and significant effect on bank profitability.*

Capital Adequacy (CA)

Athanasoglou et al. (2008) report that capital refers to the amount of own funds available to support a bank's business and therefore, bank capital acts as a safety net in the case of adverse developments. Bourke (1989), Hassan and Bashir (2003) and Samuel (2015), find a positive relationship with financial performance that a well-capitalized bank face a lower cost of going bankrupt which reduces their costs of funding and risks.

HP2*: Capital adequacy has positive and significant effect on bank profitability.*

Liquidity risk

Liquidity is the amount of short term responsibilities that could be met with the amount of liquid assets. It measures the ability of banks to meet short-term obligation or commitments when they fall due. Molyneuxand Thorton (1992), Samuel (2015) and Amdemichael (2012) comes to a conclusion that there is a negative and significant relationship between level of liquidity and profitability. Guru et al. (2002) also find a negative relationship between liquidity and bank profitability.

HP3*: Liquidity risk has positive and significant effect on bank profitability.*

Loan to Deposit Ratio

Loan-deposit ratio is a ratio between the banks total loans and total deposits. The study carried out by Rengasamy, (2014) attempt to evaluate the impact of loan to deposit ratio on ROA for locally owned commercial banks in Malaysia for the period of five years from 2009 to2013. In general, the study indicates that there was a positive impact on loan to deposit ratio to the profitability (ROA) of the banks.

HP4*: loan to deposit ratio has positive and significant effect on bank profitability.*

Management efficiency

It is one of the influential factors that determine the bank profitability. The ratio of operating expense to operating income will use as the proxy of efficiency of bank management and higher

ratios reflect a less efficient management Habtamu (2012). Indranarain (2009), Bourke (1989) and Molyneux and Thornton (1992) used operating expense to operating income and stated that Higher the efficiency level of a bank, higher its profits level. Hence a positive relationship is expected between efficiency and profitability of banks. The study conducted by Samuel (2015), determinants of commercial banks profitability in Ethiopia found positive but insignificant relationship to bank profits.

HP5*: Management efficiency has positive and significant effect on bank profitability.*

Funding cost

Funding cost used as one of a key proxy variable in this study. It is a ratio between interest expenses to deposits, which is defined as the interest expense on customer deposits expressed as a percentage of average customer deposits. This rate reflects the ability of a bank to attract deposits at a low cost. Thus, a low level of this indicator has a positive effect upon the profitability of the bank. According to Samuel (2015), found that funding cost had a negative and significant impact on commercial banks profitability in Ethiopia.

HP6*: Funding cost has positive and significant effect on bank profitability.*

Real gross domestic product

This variable is one of the best measurements to determine the total economic activities of a country. Changes in GDP reflect the changes in consumption, investment, government spending and net export, consequently changes in GDP is expected to affect supply and demand for loans and deposits. The gross domestic product growth is the annual change in the GDP. According to Bikker et al. (2002), Moges (2017), Amdemichael (2012) and Athanasoglou et al., (2008), found that there is a positive association between economic growth and financial sector profitability. We anticipate therefore a positive correlation between GDP growth and profitability.

HP7*: GDP has positive and significant effect on bank profitability.*

Inflation rate

This is one of important environmental condition which may affect both costs and revenues of most organizations including the banking institutions. Inflation is the rate at which the general

level of prices for goods and services is rising in economy overtime. Kutsienyo (2011) found that inflation has a positive impact on commercial banks profitability in Ghana. The study pointed out that inflation used as a signal that bank managers are able to forecast accurately inflation and are proactive in managing anticipated inflation. By making accurate forecast of inflation, the manager can increase the rates on loan faster than the rate at which operating cost is increasing so that inflation favorably impacts on profitability. in line with the (Bourke, 1989; Molyneux et al., 1992; Athanasoglou et al. 2005 and Tesfaye 2014), found positive relationship between inflation and bank's profitability, they indicated that inflation is anticipated by bank which give opportunity for the bank to adjust the interest rate according to the expected inflation rate, therefore it enables the revenue to be increased faster than the costs.

HP8*: Inflation has positive and significant effect on bank profitability.*

Foreign exchange Rate

Foreign Exchange risk arises due to the fluctuations in the exchange rates. Exchange rates can affect the performance of commercial banks because of their funding and get back in the form of dollar or foreign currency so that the income received is also dependent on the fluctuation of exchange rates is going on. Therefore, the risk of exchange rate plays an important part of the company's profit generated. According to Davydenko (2010) the exchange rate depreciation has a positive significant effect on income which could be explained by the ability of banks managers to anticipate exchange rate fluctuations. In line with the Aburime (2008) and Gemechu (2016), found that exchange rate is significant macroeconomic determinants of bank portability.

HP9*: Foreign exchange rate has positive and significant effect on bank profitability.*

Table 3. 1 Definitions, Notation and Expected Effect of the Explanatory Variables

	Variable	Measure	Notation	Exp. sign
Dependent variables	Return on asset	The ratio of net-profit to average total assets of bank	ROA	N/A
Independent variable	Size	Natural logarithm of Total Asset of the bank	LBS	+
	Capital adequacy	The ratio of equity to total assets	CA	+
	Liquidity risk	The ratio of current asset to total asset	LIQ	-
	Loan to deposit ratio	The ratio of Loan to Deposit	LTDR	+
	Management efficiency	The ratio of operating expense to operating income	MGE	+
	Real gross domestic product	The annual change in the GDP in %	GDP	+
	Funding cost	The ratio of Interest expense to Total Deposit	FDC	-
	Foreign exchange Rate	The average annual exchange rate (in %)	FER	+
	Inflation rate	The annual inflation rate	INR	+

CHAPTER FOUR

4 Data Analysis and Discussion of Results

4.1 Introduction

Under this section, presents the empirical results and discussions of the determinants of commercial banks profitability in Ethiopian based on annual balanced panel data of the selected banks over the period of 2006-2016. The regression analysis mainly focused on the outcome the regression analysis for the internal and external factors taken into consideration in this study and their impacts on bank's profitability in Ethiopia. The result of descriptive statistics of the selected variables, the correlation matrix and regression analysis also reported. The panel data was diagnosed for the presence of autocorrelation and heteroscedasticity.

The current chapter organized into four sections. In the first sections 4.2, were presented the descriptive statistics of the dependent and independent variables. The next, section 4.3 discussed test for the classical linear regression model/CLRM. In Section 4.4 deals with correlation analysis. Then finally, the results of regression analysis were presented under section 4.5

4.2 Descriptive Statistics

The table 4.1presents the results of the descriptive statistics for main variables involved in the regression model. The key descriptive measures are the mean, standard deviation, the minimum and the maximum values of the variables over the period take in to account. The summary statistics for all variables reported in the table below.

Table 4. 1 **Descriptive Statistics of Variables**

	ROA	MGE	LTDR	LIQ	LBS	INR	GDP	FER	FDC	CA
Mean	0.0311	0.3953	0.60699	0.4144	23.1513	0.1631	0.1051	14.716	0.0252	0.1248
Median	0.0328	0.3897	0.576858	0.37177	23.02361	0.10134	0.104062	16.1178	0.02519	0.12001
Maximum	0.04684	0.61364	0.976584	0.78199	26.21559	0.44391	0.134607	21.1059	0.04035	0.1922
Minimum	0.0038	0.20263	0.254616	0.12835	21.1895	0.07266	0.077318	8.681	0.01068	0.04201
Std. Dev.	0.00707	0.08671	0.136205	0.16859	1.117547	0.118662	0.014701	4.62746	0.00626	0.0358
Skewness	-0.78203	0.24214	0.409151	0.43324	0.900145	1.32717	0.048294	-0.1084	-0.288	-0.192
Kurtosis	4.61484	2.64715	3.541602	2.14385	3.598354	3.449885	3.003857	1.39641	2.62063	2.69794
Jarque-Bera	16.2149	1.15187	3.089464	4.76043	11.54703	23.25373	0.029979	8.40101	1.52644	0.76586
Probability	0.0003	0.56218	0.213369	0.09253	0.003109	0.000009	0.985122	0.01499	0.46616	0.68186

Source: computed from E-views 8 result

As shown in the Table 4.1 above, the descriptive statistics of the study composed of 77 observations collected from seven commercial banks in Ethiopia over the period of 2006 to 2016. The mean of return on asset (ROA) was around 3.11% for the sampled commercial banks in Ethiopia with a minimum of 0.38% and a maximum of 4.7%. This indicates, the most profitable bank among the sampled banks earned 4.7% of profit after tax for every one birr invested in the company's assets. Whereas the least profitable bank of the sampled banks earned 0.38 cents of profit after tax for every one birr invested in the company's assets. The standard deviation statistics for ROA was (0.007), which confirms that there was small variation between banks' during the study period undertaken.

The ratio of equity to total assets (CA) was a proxy measure of bank capital adequacy with a mean value of 12.48%. This implies that, the sampled banks in this particular study 12.48% of their fund needs satisfied through equity capital. The standard deviation ratio was 0.0358% with 4.2% and 19.22% as minimum and maximum values respectively.

The natural logarithm values (LBS) were proxy to their total assets of sampled banks. The mean value of this variable was 23.15 birr during the study period undertaken and have a standard deviation of 1.12 birr. This depict that, there was reasonable dispersion among banks in terms of total assets when their natural logarithms values have taken. The minimum and maximum values were 23.02 and 26.21 birr respectively.

On the other hand, the outputs of the descriptive statistics indicate that, the ratio of liquid assets to total assets was 41.44 %, on average, with a minimum of 12.83% and a maximum of 78.20%.

Loan to deposit ratio (LTDR) ratio with the minimum and maximum value of 25.46% and 97.66% respectively, with an average value of 60.70%: which indicated that a relatively large deviation from the mean by 0.14 among the bank specific independent variables. On the other hand, the smallest standard deviation was recorded in funding cost which was 00626 and shows the existence less variations among the banks in the sample under the study period.

On the macroeconomic variables, the average growth rate of real GDP of Ethiopia for the last consecutive eleven years was approximately 10.51% with a minimum economic growth of 7.3% and a maximum growth of reaching 13.46%. The standard deviation registered in the period was

0.015%; it means that economic growth in Ethiopia during the period of 2006 to 2016 relatively stable. The exchange rate during the period of this study undertaken, 1 USD exchanged on average of 14.71 birr, the local currency. Foreign exchange appeared to be the most volatile with a standard deviation of 4.63. Lastly, inflation mean is 16.31%, with maximum rise in price recorded 0.44% and minimum 0.07%. Standard deviation was 0.12.

4.3 CLRM Assumption and Model Test

In order to provide more insights into the importance of the Bank-Specific characteristics and whether this set of variables makes a significant contribution in explaining the variation in the dependent variable, for the purpose of this study, the data set checked certain diagnostic tests to ensure the model specification tests have been to fit the classical liner regression model (CLRM) assumptions and to undertake reliable estimations.

4.3.1 Heteroscedasticity

The Heteroscedasticity problems arise when the variance of the error term is not constant. As noted in Brooks, (2008, p.182) the variance of the errors is constant, this is known as the assumption of homoscedacticity. If the errors do not have a constant variance, they are said to be heteroscedastic. The study would be employed the popular white test to detect heteroscedasticity. This test involves testing the null hypothesis that the variance of the errors is constant (homoscedacticity) or no heteroscedasticity against the alternative that the errors do not have a constant variance.

In this study, as shown below, both the F-statistic and Chi-Square versions of the test statistic draw the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values were in excess of 0.05. This indicates that, there is no evidence that we do not reject the null hypothesis implying that the residuals are homoscedastic, since the p-value was considerably in excess of 0.05.

Table 4. 2 White test of Heteroscedasticity

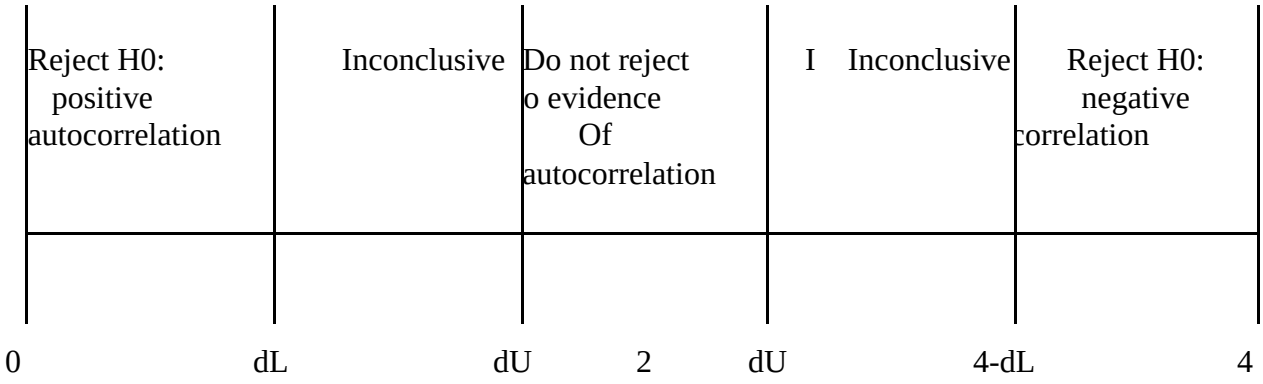
F-statistic	1.228474	Prob. F(11,65)	0.2868
Obs*R-squared	13.25277	Prob. Chi-Square(11)	0.2771
Scaled explained SS	10.09626	Prob. Chi-Square(11)	0.5217

Source: computed from E-views 8 result

4.3.2 Test for Autocorrelation

This is an assumption that the errors term in one-time period is correlated with the error term in any other time period. The study employed the popular Durbin-Watson to detect the serial correlation. According to Brooks (2008, p.197), DW has 2 critical values: an upper critical value (dU) and a lower critical value (dL), and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected. The rejection, non-rejection, and inconclusive regions are shown on the number line in Figure 4.1 bellow.

Figure 4. 1 Rejection and non-rejection region of DW test



This study used the dL and dU values for 75 observations, which as a very close of 77 observations. As indicated by the DW table for 75 observations with 9 explanatory variables at 1% level of significance, the dL and dU values are 1.227 and 1.748 respectively. The Durbin-Watson test of statistics value in table 4.3 was 2.17. This DW value of ROA lies in the region of failed to reject null hypothesis. Hence, serial correlation is not problems for this study.

Table 4. 3 outcomes of Autocorrelation Test: Durbin Watson

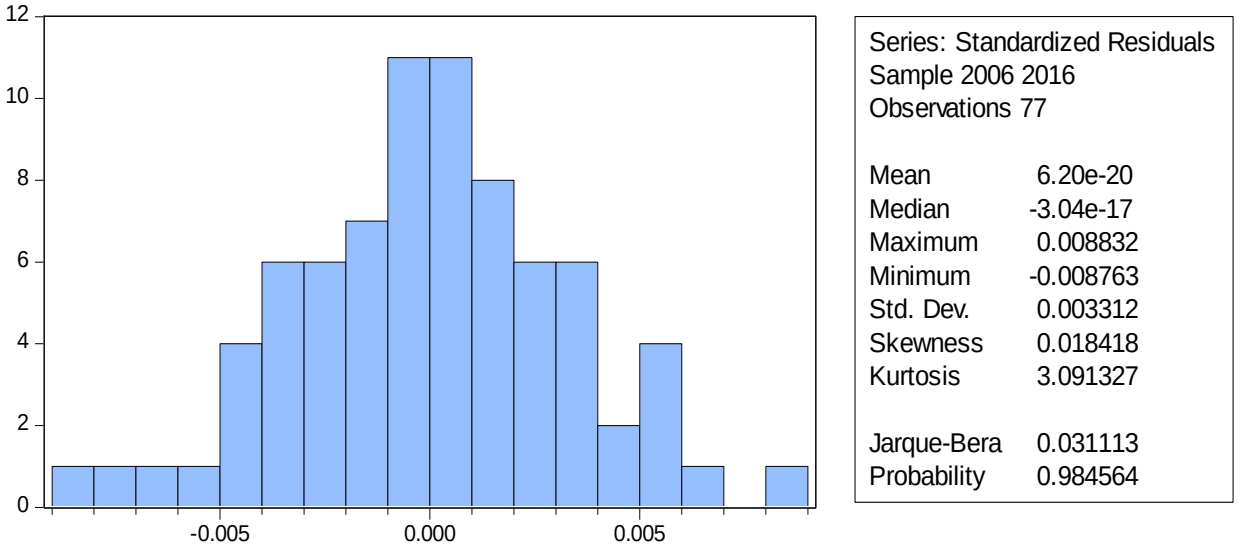
Variables	DW test static result
All bank specific, industry specific and macro-economic variables	2.17

Source: Output of Eviews 8

4.3.3. Normality test

The Other tests were carried out on the model which includes test of Normality. In order to conduct the normality assumption required a single or joint hypothesis tests about the model parameters. The popular Bera–Jarque test would be employed to check normality According to Brooks (2008, p.210) a normal distribution is defined to have a coefficient of kurtosis of 3. In the same token, if the residuals are normally distributed, the Bera--Jarque statistic would not be significant at 5% significant level. The null hypothesis is that the distribution of the residuals is normal. As shown in figure 4.2 below, the histogram is bell-shaped and with 5 % significance level, we failed to reject the null hypothesis. Therefore, the residuals are normally distributed in this study and there is no the problem of normality in the models.

Figure 4. 2 Normality test for residuals



Source: Output of Eviews 8

4.3.4 Multicollinearity

In this study, the correlation analysis was conducted to show relationship between explanatory variables. According to kutsienyo (2011, p.p IV) revealed that, Multicollinearity is the situation when some or all of the explanatory variables having a high degree of relation with each other's and making it difficult to tell which of them is influencing the dependent variable. It is observed from table 4.1 below, the result of the correlation matrix lies between the ranges of -0.68 and 0.61.

As stated by Kennedy (2008), multicollinearity creates problems when the correlation exceeds 0.80. Therefore, no problem of multicollinearity in this study.

Table 4. 4 Correlation Matrix of the independent variables

	MGE	LTDR	LIQ	LBS	INR	GDP	FER	FDC	CA
MGE	1								
LTDR	-0.43557	1							
LIQ	0.61158	-0.0993	1						
LBS	-0.00614	-0.6808	-0.499043	1					
INR	0.20298	0.09744	0.258779	-0.18428	1				
GDP	0.33667	0.07305	0.35067	-0.30726	0.475767	1			
FER	-0.19871	-0.3516	-0.501805	0.55015	-0.34358	-0.50187	1		
FDC	-0.31553	0.16017	-0.210961	-0.06879	-0.14848	-0.46541	0.610845	1	
CA	-0.05168	0.3579	0.151353	-0.38844	-0.06246	-0.16426	0.225853	0.39442	1

Source: Output of Eviews 8

4.3. 5 Correlation Analysis

The Correlation Analysis indicates that at what extent the explanatory variables are influential on the profitability indicators (ROA). With our bank specific variables, management efficiency (MGE) and funding cost (FDC) are relatively, highly impacting on ROA as indicated in table 4.2 below. MGE was the most positively correlated variable with ROA. This shows that, as the management efficiency increases, profitability also increases. On the other hand, the ratio of interest expense to total deposit (FDC), bank size (LBS) and foreign exchange rate (FER) seems to be inversely correlated with the ROA.

Table 4. 5 Correlation matrix of dependent and independent variables

	ROA	MGE	LTDR	LIQ	LBS	INR	GDP	FER	FDC	CA
ROA	1									
MGE	0.486804	1								
LTDR	0.130674	-0.435566	1							
LIQ	0.234107	0.611577	-0.099285	1						
LBS	-0.15293	-0.00614	-0.680787	-0.49904	1					
INR	0.154976	0.202979	0.09744	0.258779	-0.184279	1				
GDP	0.171008	0.336671	0.073053	0.35067	-0.307256	0.475767	1			
FER	-0.11423	-0.198713	-0.351637	-0.50181	0.550151	-0.343579	-0.501874	1		
FDC	-0.21926	-0.315529	0.160166	-0.21096	-0.068792	-0.148478	-0.465408	0.610845	1	
CA	0.199922	-0.051681	0.3579	0.151353	-0.388442	-0.062463	-0.164255	0.225853	0.39442	1

Source: Output of Eviews 8

4.4 Model selection test: Random model versus Fixed effect model

To analyse the internal and macroeconomic determinants of commercial banks profitability in Ethiopia under this study, panel regression method was employed. Vong et al., (2009) pointed out that, panel data are more appropriate, because it has provided detail information as it consists of both the cross sectional information, which captures individual variability, and the time series information, which captures dynamic adjustment. In brief, panel modelling enables to identify a common group of characteristics whilst, at the same time, considering the heterogeneity that is present among individual units.

In order to estimate the panel regression models, the Hausman test was performed to determine the appropriateness of the model to be adopted, where the null hypothesis is that the preferred model is random effects and the alternative states that the fixed effects is preferred. As indicated by the Hausman test result the probability value of the test shows 0.0000 which implies that we reject the null hypothesis saying random effect model is appropriate. Accordingly, for this research, the preferred model is the fixed effect and has been used to meet the objective of this study.

Table 4. 6 Correlated Random effect Hausman test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	19.220502	7	0.0075

Source: Output of Eviews 8

4.4.1. Fixed effect regression result

This section presents the outputs of the regression analysis on the factors that affecting bank profitability in Ethiopia.

Before running the regressions, the data sets were checked under certain assumption of classical linear regression model (CLRM). Like, test of Normality, multicollinearity, heteroscedasticity, and finally, model specification tests have been made to satisfy the assumptions and to undertake reliable estimations. Overall, the tests have been in line with the CLRM. The outputs of the regression were present in the table 4.6.

Table 4. 7 Regression analysis result

Dependent Variable: ROA
Method: Panel Least Squares
Date: 12/07/17 Time: 08:20
Sample: 2006 2016
Periods included: 11
Cross-sections included: 7
Total panel (balanced) observations: 77

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MGE	0.037636	0.011717	3.212050	0.0021***
LTDR	0.039911	0.007663	5.208394	0.0000***
LIQ	0.009849	0.007009	1.405246	0.0652***
LBS	0.003087	0.003311	0.932257	0.3550***
INR	0.017242	0.004655	3.703565	0.0005***
GDP	-0.094663	0.043082	-2.197257	0.0319***
FER	0.000698	0.000536	1.302078	0.1980***
FDC	-0.813793	0.163965	-4.963223	0.0000***
CA	-0.006413	0.026720	-0.240011	0.8112***
BOA2014DUM	0.021449	0.004269	5.024956	0.0000***
BOA2008DUM	-0.023246	0.004258	-5.459876	0.0000***
C	-0.065283	0.074707	-0.873855	0.3857***

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.780478	Mean dependent var	0.031143
Adjusted R-squared	0.717226	S.D. dependent var	0.007069
S.E. of regression	0.003759	Akaike info criterion	-8.128015
Sum squared resid	0.000834	Schwarz criterion	-7.580113
Log likelihood	330.9286	Hannan-Quinn criter.	-7.908859
F-statistic	12.33915	Durbin-Watson stat	2.164893
Prob(F-statistic)	0.000000		

*, ** and *** = significant at 10 %, 5%, and 1% confidence level
No. of observations = 77

Source: Output of Eviews 8

Empirical model: in order to identify the factors that can determine commercial banks profitability in Ethiopian the underlines model was provided as follows:

ROA=-0.07+ 0.0037MGE + 0.039LTDR + 0.009LIQ + 0.003LBS +0.017INR– 0.094GDP +
(0.074) (0.011) (0.007) (0.007) (0.003) (0.004) (0.043)

0.0006FER - 0.006CA - 0.813FDC
(0.0005) (0.163) (0.026)

R-Square 0.78, Adjusted R-Square 0.717, Prob (F-stastic) 0.000, Durbin Watson stat 2.164. Based on the results shown in table 4.6, all bank-specific independent variables except capital adequacy (CA) and bank size (LBS) had statistically significant impact on profitability. On the other hand, among the macro-economic explanatory variables used in this study GDP and inflation rate (INF) had statically significant at 5% significance level. Among the significant variables, loan to deposit ratio (LTDR) and funding cost (FDC) were significant at 1% significance level since the p-value for both variables were almost 0.000. Whereas management efficiency (MGE), inflation rate (INF) and GDP were statically significant at 5% significance level. Lastly, liquidity (LIQ) was significant at 10% significance level with p-value of 0.0587 and 0.0744 respectively. The rest, capital adequacy (CA) and bank size (LBS) were not statistically insignificant variable for the determinants profitability of banks in Ethiopia within period between 2002 and 2015.

The output also shows that the coefficient of funding cost, capital adequacy and GDP against ROA were negative with the coefficients of -0.813, -0.006 and -0.094 respectively. This described as; there was an inverse relationship between the aforementioned three explanatory variables and ROA. As a result, the increase of those variables will lead to a decrease in ROA. On the other hand, variables like loan to deposit ratio (LTDR), management efficiency (MGE), inflation rate (INF), liquidity (LIQ) and bank size (LBS) had a positive relationship with profitability as indicated a coefficient of 0.039, 0.037, 0.017, 0.009 and 0.003. This clearly shows that there was a direct relationship between the above listed five explanatory variables and ROA.

The value of R-squared statistics and the Adjusted-R squared statistics of the model was 78.04% and 71.72% respectively. The R-squared results indicate that 71.72% variation in the dependant variable (ROA) is described by the explanatory variables of the commercial bank in Ethiopia and the reaming 28.28% was explained by other factors which are not included in the model. F value of 0.000 indicates that it is significant supporting the model relevant to the study.

Management Efficiency

As expected, Management efficiency has a positive and statistically significant impact on bank profitability. The result shows that, a positive coefficient of 0.0376360 and significant at 5% significance level (p-value =0.021). The outcomes imply that, an increase (decrease) in the expenses results, decrease (increases) the profits of banks. The positive relationship also in line with the results of prior studies Habtamu (2012), and Bourke (1989). The empirical finding of this

study is also contrary to the results of Birehanu (2012) who analysed the determinants of commercial bank profitability in Ethiopia and find out that the management efficiency has a negative significant impact on profitability. Furthermore, the finding of Samuel (2015), revealed that the management efficiency has a positive and insignificant association with profitability. Thus the hypothesis that stated earlier, there is no significant relationship between management efficiency and profitability rejected.

Bank Size

Size is used to capture the impact of bank size on profitability, and is measured as the logarithm of (LBS) total assets. The result indicates that size is positively related to profitability and statistically insignificant at 1%, 5%, and 10% significance level (p-value = 0.3550). However, the coefficient 0.003087 indicates that when the log of the bank size increases by 1 unit, the other things remain constant profit (ROA) of the bank will enhanced by 0.3%. According to the result of this study, size does not lead any type of profitability for the commercial banks. The advantage of the economies of scale is not available for attaining the profit. The result is in line with Shih et al. (2007), in Chinese banks using several bank-specific factors and Tesfaye (2014), who studied the determinants of Ethiopian commercial banks performance. The study result is refuting with the finding of (Melaku, 2016; Birehanu, 2012; Amdemichael, 2012; Samuel, 2015; Habtamu, 2012; Moges, 2017; Habibullah, 2009 and Kosmidou, 2008), among other found statistically significant and has a positive impact on bank profitability.

Liquidity Risk

Regarding to liquidity risk, the results implies that the effect of liquidity was statistically significant at 10% of significance level (p-value=0.0652) and has a positive influence on profitability (ROA). The result revealed that, the increase of liquid asset leads to the enhancement of profitability. The empirical finding provides support to earlier study by among others (Eichengreen and Gibson, 2001; Sufian and Habibullah, 2009; Gemechu, 2016; Melaku, 2016 and Birehanu, 2012). According to Chinoda (2014), the availability of liquidity is influences profitability since it enhances the capacity of the bank to acquire cash, in order to fulfil present and essential needs. Therefore, for commercial banks to gain public assurance, they should have

sufficient liquidity to meet the demands loan holders and depositors needs. The finding is opposing with the study result of (Molyneuxet et.al.1992; Amdemichael, 2012 and Samuel, 2015) comes to a conclusion that a negative association exists between liquidity and profitability.

Capital adequacy

Surprisingly, capital adequacy statistically insignificant at the 10% significance level (p-value=0.8112) and have an inverse relationship with profit. The result is in line with Weersainghe & Perera (2013), determinants of profitability of commercial banks in Sri Lanka. Similarly, Tesfaye (2014), who studied the determinants of Ethiopian commercial banks performance and found that the capital adequacy is not a significant driver of profitability performance of commercial banks. Hence, regulatory measures that insist on holding a high level of capital seems to strengthen the risk bearing capacity of banks than improving their profit performance. The results appear in contradiction with the study of (Gemechu, 2016; Melaku, 2016; Birehanu, 2012; Amdemichael, 2012; Samuel, 2015; Habtamu, 2012; Ermias, 2016 and Athanasoglou et al. 2008) that argues that capital has positive and significant impact on bank profitability. Moreover, the finding is in line with the Risk Return Theory argues that capital and bank profitability are negatively associated (Saona, 2011, Ommeren, 2011). The theory suggests that increasing risks by increasing leverage of the bank leads to higher expected returns. This suggests that if a bank intends to increase its profits by increasing leverage, the equity to asset ratio (capital) has to be reduced. In contrary, Bankruptcy Cost Theory explains that the positive link between capital adequacy and profitability. If the bankruptcy costs are unexpectedly high due to the environmental changes, banks will need to hold more equity and increase their capital ratio in order to reduce the expected value of bankruptcy cost and avoid financial distress.

Funding costs

As expected, the impact of funding costs on profitability (ROA), the result implied that the coefficient of the variable is negative and statistically significant at 1% significant level (p-value=0.0000). The results imply that, an increase (decrease) in funding cost has an effect of increases (decrease) profits. A fact that supports that the study conducted by Samuel (2015).

Real GDP

The growth of GDP was statistically significant at 5% significance level (p-value 0.0319) and has a negative relationship with profitability. The coefficient of -0.094663 in the regression output indicates that GDP is a quite significant determinant of banks profitability in Ethiopia under the study period. The results show that one-unit increase in GDP will contribute 0.094663 unit decrease in return on assets. Moreover, higher GDP growth leads to lower bank profitability in Ethiopia. This result is agreed with the studies by Tan et.al, (2012). The negative relationship is in contrast with the findings of (Birehanu, 2012; Amdemichael, 2012; Samuel, 2015; Habtamu, 2012 and Moges, 2017), which stated that positive and significant association among GDP and bank profitability. The negative coefficient sign of real GDP growth rate was beyond to the researcher expectation.

Inflation

The other macroeconomic factor inflation had statistically significant at 1%. The coefficient 0.017242 indicate that, the inflation affects the bank profitability positively. When inflation of the countries increases by 1-unit, the other things remain constant the profit will increase by 0.017242 units. This may imply that bank management may anticipate the rate of inflation and react accordingly. Consequently, commercial banks in Ethiopia tend to be more profitable in inflationary environments. The result is in line with the finding of (Athanasoglou, Brissimis and Delis, 2005; Tesfaye, 2014; Moges, 2017; Molyneux and Thornton 1992, and Guru, Staunton and Balashanmugam, 2002) established positive relationship between inflation and bank profitability. Contrariwise, the studies conducted by Abreu and Mendes (2000) in Europe found a negative relationship between inflation and bank profitability. According to Samuel (2015) and Amdemichael (2012), inflation is not a significant driver of profitability performance of commercial banks. As the probability of the regression result for this variable is 0.0005. Thus, the hypothesis that stated earlier, there is no significant relationship between inflation and profitability will be rejected

Foreign exchange rate

The proxy for foreign exchange rate was the official exchange rate it refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange

market. The output of the regression analysis proves the existence of positive or direct relationship between foreign exchange rate and profitability of Ethiopian banks.

The coefficient of foreign exchange rate was positive and not statistically significant. Hence, the effect of foreign exchange rate on Ethiopian banks profitability is not significant. As per the output foreign exchange rate is not a determinant factors of banks profitability and insignificant as indicated by the large p-values of 0. 1980.The result is in line with the finding of Samuel (2015) and against the study of Gemechu (2016), argued that exchange rate has a positive and significant impact on bank profitability.

Loan to Deposit (LTDR)

Concerning the impact of loan to deposit ratio, the result of the regression output shows that, it is statistically significant at 1% significance level (p-value=0.00000) and has a positive impact on profitability (ROA). This means, it describes that one Birr given as a loan from a deposit has the effect of Birr 0.039911on bank's profitability in Ethiopia. the result of this study is also contrary to the finding of Moges (2017) that argued there is a negative and significant association among LTDR and bank profitability. Logically Higher loan to deposit ratio indicates, commercial banks has issuing more of its deposit in the form of interest bearing loans, consequently banks can have generating more profit. But if the ratio is too high banks may default in the repayment of loan. Too low loan to deposit ratio is also a risk for commercial banks.

Table 4. 8 Description of the variables and their expected relationship

Explanatory variables	Expected impact	Actual impacts
		Profitability (ROA)
LBS	Positive	Positive & insignificant
MGE	Positive	Positive & significant
LIQ	Negative	positive & significant
CA	positive	Negative & insignificant
LTD	Positive	Positive & insignificant
FDC	Negative	Negative & significant
GDP	Positive	negative & significant
INFL	negative	Positive & significant
FER	Positive	Positive & insignificant

CHAPTER FIVE

5. Conclusion and recommendation

The previous chapter emphasized the analysis of the findings and examined the result of the regression of all independent variables against the theories and earlier stated expectations. Accordingly, this chapter is organized into two subsections. The first section presents the conclusions whereas the second section presents the recommendations.

5.1 Summary of findings

The secondary data used in this analysis covered a period of 11 years from 2006 to 2016. The banks that were sampled were 7 as they provided complete data over the study period. The explanatory variables used in the regression models were mainly financial ratios. Return on asset used as a dependent variable to measure the profitability.

According to the regression results, all the bank-specific variables except capital adequacy and bank size were found to be significant in determining profitability. The results indicate that management efficiency had a positive and significant impact on bank profitability. The results also indicate that there is a positive relationship between liquidity and profitability implying that the more liquid a bank is the more profitable it becomes. Concerning funding cost and bank profitability, funding cost measured in terms of the ratio of interest expense to total deposit has a significant negative impact on bank profitability. This implies as the funding cost increases the profitability of the bank also decreases. The study also found a significant positive relationship between loan to deposit ratio and bank profitability. The regression result showed that capital adequacy and bank size statistically insignificant in determining profitability.

On the other hand, inflation was significant and had a positive influence on bank profitability implying that as the rate of inflation is increasing, profitability increases. It also implies that bank managers are able to predict inflation and adjust lending rates accordingly. Regarding to GDP the result showed that a negative and significant effect on banks profitability. But exchange rate has insignificant effect on profitability.

5.2 Conclusion

The study addressed the factors or determinants that influence and impact on bank profitability and to find out to what extent these determinants affect the Ethiopian banks profitability. The determinants were identified in to two main categories; the internal determinants and the external determinants. The internal determinants refer to the factors that are originated from bank accounts (balance sheets and/or profit and loss accounts) and could be called micro or bank-specific determinants of profitability. While, the external determinants are variables that are not related to bank management but are related to the economic and legal environment that affects the operation and performance of the firms.

This study investigates the impact of both internal and external determinants of the Ethiopian banking system profitability. The internal factors included in this study are variables such as banks size, management efficiency, loan to deposit ratio and capital ratio, liquidity risk and funding cost. While, as external determinants are used two variables gross domestic product, foreign exchange rate and inflation rate. Furthermore, the study used Return on Asset (ROA) as the main measure of bank profitability. Panel data (fixed effects model) from 2006 to 2016 of 7 commercial banks in Ethiopia was analysed using ordinary least square (OLS) regressions method.

The liquidity risk has a positive impact on ROA with strong significance coefficient. This indicates that as banks that hold more liquid asset experience less significant increase in profitability.

On the other side, the study found a capital adequacy ratio has negative and statistically insignificant impact on ROA of commercial banks in Ethiopia. However, this indicates banks with strong capital adequacy or keep the fund in the bank will have a cost and the bank will loss the profit which should be earns if the money was borrowed.

As expected, the result showed a negative relationship between funding cost and profitability with statistical significance. This shows that as minimizing commercial banks interest expense in Ethiopia would certainly improve the banks performance.

Loan to Deposit has positive and statistically significant impact on ROA.this result shows that the bank charge more than what the bank incurring as interest expense for the depositors and the more

loan the bank give will have a significant effect on banks profitability.

The Size of the bank and profitability had insignificant positive relationship as per the regression result. This means that size does not contribute any type of profitability for the commercial banks or banks are not beneficiary of the advantage of economies of scale.

Concerning the macro-economic indicators, inflation rate plays an important role in explaining the banks' return on assets. The positive relationship between inflation and bank performance suggests that a bank's income increase more with inflation than its costs.

In general, the findings revealed that liquidity risk, loan to deposit ratio, management efficiency, funding cost, inflation rate and GDP are the major significant determinants of the profitability of the bank in Ethiopia. However, the output of regression model showed that the impact of capital adequacy, bank size and foreign exchange rate on ROA of commercial banks in Ethiopia is not significant for the period under consideration. The relationship between profitability and loan to deposit ratio, management efficiency, liquidity risk and inflation was found to be positive and for GDP and funding cost the relationship were negative.

5.3 Recommendations

Based on the findings and conclusions of the study the following recommendations are provided.

- The regression results in this research imply that the relation between liquidity and ROA is positive and significant. So, the commercial bank in Ethiopia, need to focus on that investing in short-term, less risky securities like government treasury bills leads to increased profitability
- Management efficiency, funding cost, liquidity risk, loan to deposit ratio are significant key internal drivers of profitability of commercials banks in Ethiopia. Actually, focusing and redesign the firms together with these indicators could improve the profitability as well as the performance of the commercial banks in Ethiopia.

- The study provides suggestion for managers to focus on properly managing the level of non-interest expenses like reducing operating, administrative and personnel expense through using common facilities such as ATM and Agent banking service

- Finally, the study required to investigate the factors that influence profitability of commercial banks in Ethiopia. However, the variables used in the statistical analysis did not include all factors that can affect Ethiopian banks profitability. Thus, future research could incorporate factors such as effect of regulations by national bank. In this study exchange rate is found to be insignificant effect on profitability but further research looking at the impact of exchange rate on profitability after devaluation.

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Appendices

Appendix-I Regression output

Dependent Variable: ROA
Method: Panel Least Squares
Date: 12/07/17 Time: 08:20
Sample: 2006 2016
Periods included: 11
Cross-sections included: 7
Total panel (balanced) observations: 77

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MGE	0.037636	0.011717	3.212050	0.0021
LTDR	0.039911	0.007663	5.208394	0.0000
LIQ	0.009849	0.007009	1.405246	0.0652
LBS	0.003087	0.003311	0.932257	0.3550
INR	0.017242	0.004655	3.703565	0.0005
GDP	-0.094663	0.043082	-2.197257	0.0319
FER	0.000698	0.000536	1.302078	0.1980
FDC	-0.813793	0.163965	-4.963223	0.0000
CA	-0.006413	0.026720	-0.240011	0.8112
BOA2014DUM	0.021449	0.004269	5.024956	0.0000
BOA2008DUM	-0.023246	0.004258	-5.459876	0.0000
C	-0.065283	0.074707	-0.873855	0.3857

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.780478	Mean dependent var	0.031143
Adjusted R-squared	0.717226	S.D. dependent var	0.007069
S.E. of regression	0.003759	Akaike info criterion	-8.128015
Sum squared resid	0.000834	Schwarz criterion	-7.580113
Log likelihood	330.9286	Hannan-Quinn criter.	-7.908859
F-statistic	12.33915	Durbin-Watson stat	2.164893
Prob(F-statistic)	0.000000		

Appendix-II Raw Data

BANKS	YEARS	ROA	LBS	CA	LIQ	GDP	MGE	INR	FER	LTDR	FDC
CBE	2006	0.023	24.303	0.042	0.592	0.1154	0.5323	0.1231	8.681	0.271	0.0117
CBE	2007	0.022	24.495	0.097	0.590	0.1179	0.5402	0.1724	8.794	0.255	0.0107
CBE	2008	0.029	24.644	0.090	0.354	0.1118	0.4815	0.4439	9.244	0.432	0.0142
CBE	2009	0.035	24.808	0.085	0.263	0.1003	0.3872	0.0847	10.421	0.466	0.0141
CBE	2010	0.029	25.030	0.075	0.210	0.1051	0.3897	0.0814	12.891	0.431	0.0136
CBE	2011	0.030	25.462	0.055	0.265	0.1346	0.4164	0.3322	16.118	0.414	0.0132
CBE	2012	0.040	25.791	0.049	0.158	0.0870	0.4208	0.2277	17.254	0.523	0.0144
CBE	2013	0.034	26.007	0.046	0.180	0.0994	0.3169	0.0808	18.195	0.457	0.0156
CBE	2014	0.030	26.216	0.044	0.128	0.1030	0.3023	0.0739	19.075	0.454	0.0179
CBE	2015	0.016	25.635	0.163	0.246	0.1041	0.3779	0.1013	20.096	0.488	0.0300
CBE	2016	0.029	25.858	0.153	0.238	0.0773	0.3381	0.0727	21.106	0.546	0.0321
AB	2006	0.030	21.806	0.103	0.362	0.1154	0.3991	0.1231	8.681	0.693	0.0181
AB	2007	0.042	22.066	0.113	0.363	0.1179	0.3746	0.1724	8.794	0.772	0.0191
AB	2008	0.033	22.296	0.124	0.477	0.1118	0.4066	0.4439	9.244	0.675	0.0264
AB	2009	0.025	22.583	0.117	0.642	0.1003	0.4210	0.0847	10.421	0.517	0.0252
AB	2010	0.034	22.796	0.118	0.662	0.1051	0.5583	0.0814	12.891	0.491	0.0245
AB	2011	0.040	23.037	0.129	0.523	0.1346	0.5745	0.3322	16.118	0.496	0.0275
AB	2012	0.036	23.203	0.135	0.343	0.0870	0.3980	0.2277	17.254	0.582	0.0292
AB	2013	0.038	23.422	0.135	0.285	0.0994	0.4020	0.0808	18.195	0.600	0.0309
AB	2014	0.035	23.720	0.126	0.336	0.1030	0.4331	0.0739	19.075	0.596	0.0324
AB	2015	0.029	23.896	0.129	0.210	0.1041	0.3648	0.1013	20.096	0.662	0.0337
AB	2016	0.028	24.111	0.129	0.254	0.0773	0.3192	0.0727	21.106	0.666	0.0326
DB	2006	0.033	22.238	0.085	0.311	0.1154	0.3406	0.1231	8.681	0.834	0.0187
DB	2007	0.035	22.522	0.090	0.344	0.1179	0.3402	0.1724	8.794	0.800	0.0199
DB	2008	0.034	22.781	0.093	0.474	0.1118	0.3729	0.4439	9.244	0.696	0.0274
DB	2009	0.028	22.999	0.093	0.593	0.1003	0.4246	0.0847	10.421	0.549	0.0242
DB	2010	0.029	23.237	0.091	0.518	0.1051	0.4995	0.0814	12.891	0.487	0.0254
DB	2011	0.033	23.408	0.095	0.526	0.1346	0.5292	0.3322	16.118	0.515	0.0271
DB	2012	0.041	23.587	0.104	0.411	0.0870	0.4797	0.2277	17.254	0.565	0.0310
DB	2013	0.033	23.706	0.104	0.382	0.0994	0.4382	0.0808	18.195	0.547	0.0289
DB	2014	0.034	23.813	0.118	0.370	0.1030	0.4681	0.0739	19.075	0.533	0.0316
DB	2015	0.031	23.933	0.118	0.279	0.1041	0.4377	0.1013	20.096	0.572	0.0345
DB	2016	0.027	24.076	0.118	0.302	0.0773	0.4433	0.0727	21.106	0.548	0.0342
BOA	2006	0.035	21.765	0.142	0.359	0.1154	0.2500	0.1231	8.681	0.874	0.0188
BOA	2007	0.022	21.946	0.119	0.376	0.1179	0.2434	0.1724	8.794	0.807	0.0221
BOA	2008	0.004	22.175	0.098	0.415	0.1118	0.2735	0.4439	9.244	0.738	0.0269
BOA	2009	0.021	22.424	0.095	0.600	0.1003	0.3185	0.0847	10.421	0.544	0.0249
BOA	2010	0.024	22.561	0.093	0.576	0.1051	0.4416	0.0814	12.891	0.568	0.0248
BOA	2011	0.027	22.708	0.091	0.477	0.1346	0.3980	0.3322	16.118	0.528	0.0269
BOA	2012	0.028	22.832	0.110	0.373	0.0870	0.3120	0.2277	17.254	0.561	0.0308
BOA	2013	0.024	23.039	0.109	0.232	0.0994	0.3120	0.0808	18.195	0.542	0.0245
BOA	2014	0.042	23.146	0.136	0.302	0.1030	0.3804	0.0739	19.075	0.556	0.0348
BOA	2015	0.023	23.338	0.132	0.564	0.1041	0.2930	0.1013	20.096	0.531	0.0334
BOA	2016	0.024	23.546	0.126	0.228	0.0773	0.3279	0.0727	21.106	0.588	0.0332

WB	2006	0.037	21.538	0.113	0.372	0.1154	0.4545	0.1231	8.681	0.853	0.0197
WB	2007	0.039	21.970	0.116	0.485	0.1179	0.4219	0.1724	8.794	0.756	0.0202
WB	2008	0.037	22.140	0.147	0.608	0.1118	0.4465	0.4439	9.244	0.744	0.0302
WB	2009	0.039	22.356	0.163	0.782	0.1003	0.5053	0.0847	10.421	0.532	0.0224
WB	2010	0.041	22.471	0.183	0.774	0.1051	0.5627	0.0814	12.891	0.606	0.0193
WB	2011	0.047	22.810	0.166	0.695	0.1346	0.6136	0.3322	16.118	0.466	0.0168
WB	2012	0.041	22.845	0.192	0.485	0.0870	0.4805	0.2277	17.254	0.604	0.0243
WB	2013	0.037	23.064	0.176	0.368	0.0994	0.3845	0.0808	18.195	0.607	0.0228
WB	2014	0.028	23.143	0.186	0.213	0.1030	0.3825	0.0739	19.075	0.540	0.0275
WB	2015	0.028	23.341	0.176	0.248	0.1041	0.3564	0.1013	20.096	0.615	0.0295
WB	2016	0.025	23.508	0.173	0.280	0.0773	0.3319	0.0727	21.106	0.678	0.0309
UB	2006	0.033	21.190	0.120	0.486	0.1154	0.4365	0.1231	8.681	0.799	0.0238
UB	2007	0.034	21.504	0.165	0.492	0.1179	0.3646	0.1724	8.794	0.887	0.0260
UB	2008	0.034	21.902	0.144	0.567	0.1118	0.3880	0.4439	9.244	0.741	0.0257
UB	2009	0.024	22.261	0.112	0.687	0.1003	0.3910	0.0847	10.421	0.577	0.0242
UB	2010	0.033	22.498	0.108	0.693	0.1051	0.5084	0.0814	12.891	0.533	0.0221
UB	2011	0.034	22.768	0.117	0.587	0.1346	0.4626	0.3322	16.118	0.525	0.0239
UB	2012	0.036	22.897	0.125	0.424	0.0870	0.3763	0.2277	17.254	0.590	0.0294
UB	2013	0.023	23.024	0.120	0.256	0.0994	0.3361	0.0808	18.195	0.573	0.0307
UB	2014	0.018	23.198	0.138	0.380	0.1030	0.2541	0.0739	19.075	0.561	0.0313
UB	2015	0.021	23.388	0.117	0.231	0.1041	0.2893	0.1013	20.096	0.574	0.0327
UB	2016	0.021	23.572	0.120	0.224	0.0773	0.2674	0.0727	21.106	0.646	0.0403
NIB	2006	0.031	21.445	0.141	0.300	0.1154	0.3354	0.1231	8.681	0.977	0.0227
NIB	2007	0.033	21.682	0.163	0.370	0.1179	0.2933	0.1724	8.794	0.934	0.0224
NIB	2008	0.036	22.018	0.164	0.540	0.1118	0.3367	0.4439	9.244	0.823	0.0252
NIB	2009	0.036	22.293	0.152	0.708	0.1003	0.4047	0.0847	10.421	0.643	0.0228
NIB	2010	0.037	22.510	0.154	0.743	0.1051	0.5215	0.0814	12.891	0.593	0.0217
NIB	2011	0.038	22.685	0.165	0.707	0.1346	0.4931	0.3322	16.118	0.514	0.0232
NIB	2012	0.037	22.837	0.185	0.511	0.0870	0.4290	0.2277	17.254	0.618	0.0260
NIB	2013	0.034	22.936	0.182	0.339	0.0994	0.3297	0.0808	18.195	0.666	0.0278
NIB	2014	0.030	23.098	0.183	0.242	0.1030	0.3297	0.0739	19.075	0.683	0.0233
NIB	2015	0.028	23.308	0.164	0.184	0.1041	0.2653	0.1013	20.096	0.705	0.0307
NIB	2016	0.027	23.485	0.159	0.240	0.0773	0.2026	0.0727	21.106	0.605	0.0316