

**DETERMINANT OF COMMERCIAL BANKS PROFITABILITY
IN ETHIOPIA (CASE STUDY SELECTED COMMERCIAL
BANKS IN ETHIOPIA)**

**A Senior Essay paper submitted to Department of Accounting and Finance
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**COLLEGE OF BUSINESS AND ECONOMICS
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Declaration

I declare that the thesis for the BA degree in accounting and finance at the University of Wolkite hereby submitted by me is my original work and has 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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Signature _____

Date _____

Sentayehu Alemu

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Abstract

The aim of this study was to investigate the effect of bank-specific and macroeconomic determinants of commercial bank profitability in Ethiopian. The study was selected six commercial banks from year 2010 to 2017. The study was used an explanatory type of research design and it would be use secondary financial data and Fixed effect regression model was applied to examine the impact of bank size, capital adequacy, management efficiency, loan to deposit ratio, funding cost, foreign exchange rate, GDP and inflation rate on profitability. Return on assets (ROA) was use as a measure of profitability. The major examining of the study would be showing that management efficiency and inflation rate was statistically significant and positive relationship with banks' profitability. Funding cost, bank size, foreign exchange rate and GDP have a negative and statistically insignificant relationship with banks' profitability. Also the relationship for capital adequacy and loan to deposit ratio was found to be positive relationship with profitability and statistically insignificant. The study suggests focusing and redesigns 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

BS-Bank size

CA - Capital adequacy

CAPM-Capital asset pricing model
CBE - Commercial Bank of Ethiopia
FER - Foreign Exchange Rate
FDC-Founding cost
GDP - Gross Domestic Product
LTDR - Loan to Deposit Ratio
MGE - Management Efficiency
NBE - National Bank of Ethiopia
Nib – Nib International Bank
ROA- Return on Asset
INFR- Inflation rate

CHAPTER ONE

INTRODUCTION

1.1, Background of the study

Profitable banking sector is important for the overall financial stability of any economy operating under a bank-based financial system. The world economic crisis of 2008 that originated in the USA and which is considered to be the worst crisis since the great Depression, at recent time the Bank of England concluded in its June 16, 2016, Monetary Policy statement that it views the most significant risks to their forecast of the UK economy related to concerns about the Brexit referendum and the Greek government debt crisis was the sovereign debt crisis faced by Greece in aftermath of the financial crisis of 2009-2017. all the above problem is increase unemployment rate, inflation, cause on household consumption and because of all this thing the financial sector is not rapidly developed. but this problem is prove by a sound and profitable banking sector for the overall financial stability of any economy operating under a bank-based financial system (Jenkins, 2016).

Banks get a great deal of attention in the economic literature considering that banks play a crucial role in the economy. When the banking system in a country is effective, efficient and disciplined it brings about rapid growth in the various sectors of the economy. Moreover, the bank failures experienced in the United States of America during the great depression of the 1930's prompted considerable attention to bank performance. And the attention has grown ever since then Heffernan 2005 (as noted in Olweny&Shipo, 2011) the global financial crisis of 2007/2008 also show the importance of bank performance both in national and international economies.

Ethiopia as a developing country has a banking industry which is growing each year due to the increase in the number of people holding bank accounts. 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 crucial role in the circulation of finance (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 (Oustré, 2013). According to Samuel (2015, p. 1), commercial banks in Ethiopia are the backbone of the country's financial system. According to Aurora (2014, p. 104), the importance of banks originates from their role as main channels of savings and allocators of credit in an economy.

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 insufficient money countries, like Ethiopia, while financial sector is dominated by banking industry, effective and efficient functioning of the Banks has significant role in speeding economic growth (Berhanu2015).

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.

1.2, Statement of the problem

The determinants of profitability have been disputed for many years and yet unsolved issues in the financial institution literature. The determinant of profit is change through time to time and differ with the nature of operating of the firm from place to place (Flamini et al, 2009). The best performance of any industry is plays the role of increasing the market value of that specific firm with the role of leading towards the growth of the whole industry which ultimately leads to the overall success of the economy.

Measuring the profitability of financial institutions has gained the relevance in the corporate finance literature because as intermediaries, these companies in the sector are not only providing the mechanism of saving money and transferring risk but also helps to channel funds in an appropriate way from surplus economic units to deficit economic units so as to support the investment activities in the economy. The recent economic crisis has highlighted that a well-functioning financial system is significantly important for economic growth. The financial system enables an economy to be more productive as it allows investors with few resources to use savings from those with few prospects of investing (Dawit, 2017).

Commercial banks in Ethiopia have over the years depended very much on increasing lending rates in order to maximize profits, without much regard to the efficient use of resources that could result in cost minimization. Thus the performance of commercial banks should be measured in respect of total assets, loans, non-interest income, total overhead expenses, and book value of stockholders' equity. The Ethiopian banking sector, regardless of the continues of changes and liberalization measures undertaken which is expected to change the ownership structure, the concentration, and profitability performance of the sector as compared to the situations prevalent before the reform period, currently the country's banking sector is characterized by the existence of high concentration (low competition) operational inefficiencies and low profitability of the sector (cited by Lelisa, 2007).

Ethiopian banking industry is characterized by fear, i.e. banks tend to avoid risky investments which may result in greater amount of profit for them and lack of active secondary stock market

in the country which may have reduced their investment opportunity and their profitability still not operating at their full capacity. In general, at recent time Ethiopian banks were lack of competition, limited number of branches, poor asset quality, and low efficiency, higher levels of liquidity and others clearly indicate as they are still not performing well and attaining the maximum profit that they can achieve (Dawit, 2017).

The study by Susan (2014), bank size which is measured by natural log of total assets has positive significant effect on profit of Kenyan top six commercial banks. According to study by Sehrish et al (2011) bank size have significant positive relation with ROA, where total assets indicate the size of the bank. This positive relationship shows that the size of the bank have significant positive impact on profitability. Goddard et al. (2004) examined that the evidence for any consistent or systematic size–profitability relationship is relatively weak. However, Ani et al cited (2012) the size has a significant negative relationship with profitability. This significant negative relationship shows that the size of a bank could significantly affect the profitability of the bank negatively. The major outcome of this study is that higher total assets may not necessarily lead to higher profits.

The study by Susan (2014), increases in bank operation expenses reduce bank profitability of the top Kenyan banks in the period 2008-2013. Molyneux and Thornton (1992) and Naceur (2003) found that bank operation expenses are positively associated with high profits. Therefore the results was implies that poor expenses management explains the poor performance of commercial banks. Negative relationship has been helped by various studies like Bourke (1989), Jiang et al (2003), Obamuyi (2013), and suggesting that profitable banks operate at lower costs. However, this variable gives mixed results as shown by other studies. Molyneux and Thornton (1992) found that expenses impact positively on profits.

The positive association between profitability and expenses was also observed in a study done in Tunisia (Naceur, 2003), and in Malaysia (Guru et al., 2002).cited by Ani et al (2012), an asset composition (ratio of total loans and advances to total asset) shows a positive and significant relationship with profitability. The study assuming other variables remains constant concludes the higher the rate of transforming deposits into loans, the higher the profitability of the bank. In

addition to these studies, Sehrish et al(2011) study concludes loan shows positive and significant relationship with ROA.

The study by Abreu andMendes (2000), SehrishGul et al(2011) and Athanasoglou et al. (2006) gives evidence of a positive association between loan ratio and bank profitability. But studies by Bashir and Hassan(2003) and Staikouras and Wood (2003) contradict the above results by arguing that higher loans impact negatively on bank profits.

Dietrich andWanzenried (2011), found a positive association between the degree of diversification and bank performance. The findings of the study by Barros, Ferreira and Williams (2007), was argument diversification has a negative impact on bank performance. They argue that the more diversified banks are less likely to be successful and more likely not to perform well.

Study by Sehrish et al (2011), shows deposits to total assets have the positive and significant impact on the profitability of the banks. It shows that deposits have positive impact on profitability and banks depending on deposits for funds can achieve better ROA. Different studies show that bank performance can also be determined by the amount of deposits.

Cited by Alkassim (2005) and Ani et al., 2012 deposits have the positive and significant impact on the profitability of the bank.

Many literatures on the banking sector have pointed out that a great deal of economic activity would be seriously hindered if the most prominent agents in the credit markets, the commercial banks, did not execute their function properly. A sound and profitable banking sector is able to resist negative shocks and contributes to the stability of the financial system and sustainability of overall economic development. Thus, identifying the key success factors of commercial banks could allow the bank management and directors to formulate policies for improving the profitability of the banking industry.

According to different banking area researchers, the banking sector profitability determinants are divided into two main categories, namely the internal determinants and the external determinants. The internal determinants include management controllable factors such as the level of deposit, the level of loans and advances, investment in securities, non-performing loans,

non interest incomes, and overhead expenditure. Other determinants such as total capital and capital reserves also play a major role on impact of profitability. Similarly, external determinants include those factors which are without the control of management of the bank such as market share, market growth, market concentration, interest rates, inflation rates, and GDP growth According to (Damena, 2011).

Therefore, the attention of this research will to investigate the main determinants of Ethiopian commercial banks profitability by adding variables loan to deposit ratio as a determinant of profitability which are not included in previous study. Thus, this study seeks to fill the gap by adding the full information with respect to profitability and the connection between profitability and internal and external determinant factors for detailed examination. Therefore, this study will be search to fill the gap by adding full information about the internal and external factors that influence profitability by investigating the untouched one and copying the existing in the Ethiopian context by using six commercial banks operated in the country and have 8 years of data.

1.3. Hypotheses

The following hypotheses were formulated based on the internal and external factors that determine bank profitability. Accordingly, the study was attempted to test the following major hypotheses:

HO1: Bank size has positive influence and significant to bank profitability.

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

HO3: Loan to deposit ratio has negative influence and significant effect on bank profitability.

HO4: Management efficiency has positive influence and significant effect on bank profitability.

HO5: Funding cost has negative influence and significant outcome on bank profitability.

HO6: Macroeconomic factor has positive influence and significant effect on bank profitability.

1.4 Objectives of the Study

1.4.1 General Objective

The major objective of the study would be investigated the determinants of commercial bank profitability in Ethiopia.

1.4.2 Specific Objectives

More specifically, the study will address to:

- ✓ To identify the major internal factors that determines the commercial banks profitability in Ethiopia;
- ✓ To examining the effect of macroeconomic (external factors) on the determinant of commercial banks profitability in Ethiopia;
- ✓ To explain the relationship between independent variables and dependent variables and;
- ✓ To accomplish which bank profitability theory best explains the result of research or investigation this research.

1.5, Scope of the study

The study would be carried out on financial data of six 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 profitability in the period of 2010-2017 (8years). The idea was to examine empirically the factors and studies how they affect the profitability of these commercial banks in Ethiopia between these periods.

1.6, Limitation of the Study

The study would use more of financial related variables than that of non-financial measure variables which may have impact and might need investigation. Financial reports within eight years may be affecting by different non-model variables in the state of the economy. This might fail to measure the actual effects of the internal and external determinants of profitability of private banks.

1.7, Significance of the study

The main reason for this study is to show the bank specific, industry specific and macroeconomic determinants of profitability of commercial banks in Ethiopia. After this study, particularly importance for: Management: Administration interest in explaining indicators of success and failure to take the necessary actions to solve the performance of the company and choose the right decisions, Government is interest in knowing which companies operate successfully or fail to take the necessary measures to ignore crises of the bankruptcy in these companies, Investors are interest in such studies in order to protect their investment, and directing it to the best investment, Customers are interest in knowing the ability of banks to pay their obligations based on the indicators of success of the companies and it will use for researchers it as a source of reference for further studies on the area in the future.

1.8, Organization of the proposal

This study is mainly focus on the identification of both the internal and the external factors which includes the industry-specific factors as well as the broader macro-economic factors that can affect the profitability of commercial banks in Ethiopia. The study was organized into five chapters. Chapter one presents introductions of the study. The literature review part of the study is present in Chapter two. Chapter three presents the research design and methodology. The results of the different methods used and analysis of the results will presenting chapter four and at the end, chapter five was presents the conclusions and recommendations.

CHAPTER TWO

LITRETURE REVIEW

2.1 THEORETICAL LITRETURE

Banks are bringing profits by charging an interest rate on their holdings of securities and loans that is higher than the expenses on their liabilities. In general terms, banks bring profits by selling liabilities with one set of characteristics (a particular combination of liquidity, risk, size, and return) and using the proceeds to buy assets with a different set of characteristics (Mishkin, 2004).

Banks get funds by borrowing and by issuing other liabilities such as deposits. These deposits include deposits on which checks can be written, deposits that are payable on demand but do not allow their owner to write checks or saving deposit and deposits with fixed terms to maturity or time deposit. Then use these funds to find assets such as securities and loans. Bank capital is cover up against a drop in the value of its assets, which could force the bank into insolvency (having liabilities in excess of assets, meaning that the bank can be forced into liquidation). Banks make profits primarily by issuing loans. A loan is a liability for the individual or corporation receiving it, but an asset for a bank, the reason it provides income to the bank. Loans are typically less liquid than other assets, because they cannot be turned into cash until the loan matures. Loans also have a higher probability of default than other assets. Because of the lack of liquidity and higher default risk, the bank earns its highest return on loans. The largest categories of loans for commercial banks are commercial and industrial loans made to businesses. Commercial banks also make consumer loans and lend to each other. To increase its profits, a bank must simultaneously seek the highest returns possible on loans and securities, reduce risk, and make adequate provisions for liquidity by holding liquid assets. (Mishkin 2004).

Although net income gives us an idea of how well a bank is doing, it suffers from one major limitation: It does not adjust for the bank's size, thus making it hard to compare how well one bank is doing relative to another. A main measure of bank profitability that corrects for the size of the bank is the return on assets (ROA) which divides the net income of the bank by the

amount of its assets. ROA is a useful measure of how well a bank manager is doing on the job because it indicates how well a bank's assets are being used to make profits. Although ROA provides important information about bank profitability, it is not what the bank's owners (equity holders) care about most. They are more concerned about how much the bank is earning on their equity investment, an amount that is measured by the return on equity (ROE), the net income per equity capital. Another commonly watched measure of bank performance is called the net interest margin (NIM), the difference between interest income and interest expenses as a percentage of total assets. If a bank manager has done a good job of asset and liability management such that the bank gets substantial income on its assets and has low costs on its liabilities, if the bank is able to increase funds with liabilities that have low interest costs and is able to acquire assets with high interest income, the net interest margin will be high, and the bank is likely to be highly profitable. If the interest cost of its liabilities increases relative to the interest earned on its assets, the net interest margin will fall, and bank profitability will suffer. (Mishkin, (2004).

Bankruptcy Cost Theory (1958)

Aremu, Ekpo & Mustapha cited (2013) argued that "Bankruptcy Cost Theory" identifies the positive connection between capital adequacy and profitability. If the bankruptcy costs are unexpectedly high due to the environmental dynamic, banks will need to hold more equity and raise their capital ratio in order to minimize the expected value of bankruptcy cost and avoid financial distress.

Economies of Scale Theory

Economic of scale theory argued that large corporations are able to gain cost advantage when they make economies of scale identify the positive relationship between bank size and profitability. Bashir cited (1999), large bank is able to benefit from economies of scale as large bank is able to minimize cost of gathering and processing information which ultimately increased profitability.

Efficiency Theory

The efficiency theory is citing 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 identify that attaining higher profit margins increases from efficiency which allows banks to get both good financial profit and market shares (Mirzaei, 2012). “Efficiency Structure Theory” also argued that banks able to earn higher profits if they are efficient than others. Efficient structure hypothesis argued that large banks have superior management and production technologies which able to lower down operational costs, so 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” identify negative relationship between capital adequacy and performance. 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 estimation of the relationship that exists between a financial risk and the expected return. The expected outcome 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 performance of a bank; it is a ratio of total net income to total assets. Golin (2001) concludes that ROA is the main 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 Goaid (2008) they found that ROA is significant than ROE because ROA shows the profits gain per unit of asset which reflects bank’s ability in utilizing the financial and real assets to generate profits, whereas ROE has neglects financial structure. 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 limitation 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 make 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 not include 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. Justification of variables and development of Hypothesis

Dependent variables

Different researchers have employed different Bank profitability proxy measures to determine the factors affecting banks' performance. For example, 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 paper, 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 main 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 make returns on its portfolio assets (Kosmidou, 2008; Naceur and Goaid, 2008). ROA

indicates the profit earned per unit asset and which is most essential, 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.

Independent variables

Bank Size

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 identify 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 decrease 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.

Ho1: Bank size has positive impact 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 so, 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 profitability that a well-capitalized bank face a lower cost of going bankrupt which minimize their costs of funding and risks.

Ho2: Capital adequacy 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 influence on loan to deposit ratio to the performance (ROA) of the banks.

Ho4: 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. therefore 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.

Ho5: Management efficiency has positive and significant effect on bank profitability.

Funding cost

Funding cost use will as one of a key proxy variable in this research. It is a ratio between interests 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.

Ho6: Funding cost has positive and significant effect on bank profitability.

Macroeconomics factor (variables)

Real gross domestic product

This will be 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.

Inflation rate

This is one of essential 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 increasing in economy overtime. Kutsienyo (2011) found that inflation has a positive impact on commercial banks profitability in Ghana. The study pointed out that inflation important as a signal that bank managers are able to forecast accurately inflation and are proactive in managing act before 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.

Foreign exchange Rate

Foreign Exchange risk arises due to the fluctuation in the exchange rates. Exchange rates can affect the profitability 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 essential part of the company's

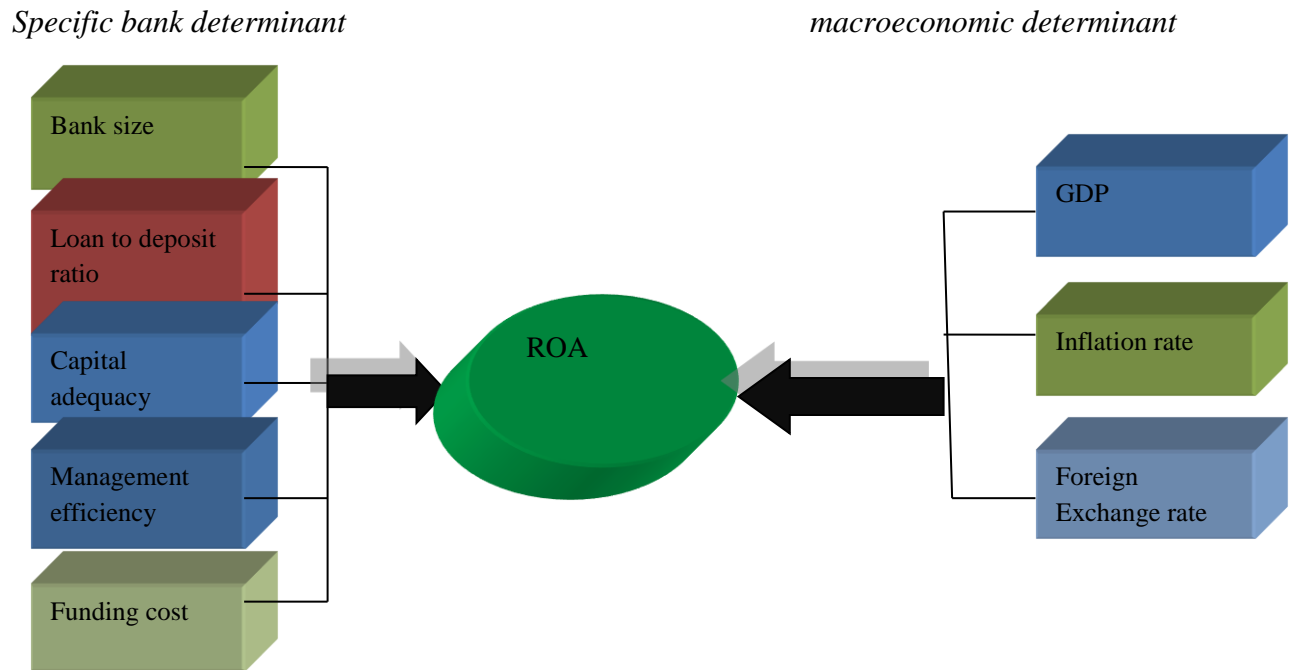
profit generated. According to Davydenko (2010) the exchange rate depreciation has a positive significant effect on income which could be explained by the ability of banks managers to anticipate exchange rate fluctuations. In line with the Aburime (2008) and Gemechu (2016), found that exchange rate is significant macroeconomic determinants of bank portability.

HO7: Macroeconomic factor has positive and significant effect on bank profitability

2.3, conceptual framework

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

Figure 2.1 Relations between profitability and its determinants



Source; developed by researcher

2.4, Empirical Literature Review

Aburime (2008) examine 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.

Athanasogluet. al. (2006) investigated 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 10 year ago. 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.

Pasioras and Kosmidou (2007) investigated the effects of ten 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.

Goddard et al. (2004) examined 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 importances 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.

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 influence on bank performance. Also, the empirical findings argued 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.

Alper and Anbar (2011) examined bank specific and macroeconomic determinants of commercial bank performance 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 performance.

Antonio Trujillo-Ponce (nd, 5) writes that prior studies have categorized the factors determining the profitability of banks into two main groups. In the first category fall, TrujilloPonce points out, determinants of profitability that are bank-specific and that arise from managerial decisions such as asset structure, asset quality, capitalization, financial leverage, 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 impact 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 performance 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 bankspecific 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 explain the important 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 influence 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 result from the panel regression argued 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.

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

Amdemikael (2012) examined Factors Affecting Profitability on Ethiopian Banking Industry. This study investigated 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 8 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) investigated the determinants of Ethiopian private commercial banks profitability in Ethiopia by using panel data of 7 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 influence of capital adequacy, asset quality, managerial efficiency, liquidity, 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 managers 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 investigate 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.

2.5, Summary and knowledge gap

Generally empirical review for this research provides back ground information of commercial bank profitability. Most of the research works are not following the regulatory standards to identify the various internal factors that determine the profitability of banks. The frameworks used to explain internal determinants sometimes vary with the regulatory rating standards. Also the financial ratios to be used for measuring profitability 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 the same with liquid asset to total ratio standard set by the regulatory organ. Therefore, the objective of this study is to investigate the factors that determine bank profitability in Ethiopia and to solve the knowledge gap that exists in the area by incorporating and testing a new variable loan divided by deposit or loan to deposit ratio which is not tested by prior Ethiopian researchers. And it narrow time gap.

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 would use panel data (both time series and cross sectional data) of eight commercial banks operating in Ethiopia .As cited from (Baltagi 2005) the advantage of using panel data is that it controls for individual heterogeneity, less co linearity variables and tracks distributes or trends in the data something which simple time-series and cross-sectional data can provide.

To investigate the impact of independent variables (size, loan to deposit ratio, capital adequacy, funding cost, inflation, GDP and exchange rate) on the dependent variable (Return on Asset) for the period 2010-2017.

3.2 Population and Sampling Techniques

The target population of this study was included all commercial banks register by NBE and operating in Ethiopia. According to NBE 2015/16 reports, currently, the number of banks decreases to 18 from 19 due to the merger of Construction & Business Bank with Commercial Bank of Ethiopia.

In the country 18 banks from this 16 are private and 2 publics. But in this study because of lack data it was used 8 years data that is require for the analysis purpose. The number of sample banks used was six.

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

3.3 Data source and collection methods

In order to achieve the research objectives mentioned section 1.3, the study was used audited financial statements. The data is set use cover a period of 7 years starting from 2010 to 2017, involving of six commercial banks in Ethiopia (CBE, AIB, WB, BoA, UB and NIB for 8 following years. The study was used secondary data. The secondary data is collect from annual reports and audited financial report of the selected sample banks. The website of each of the banks was visited to collect necessary data for the study.

3.4 Methods of Data analysis

The data would analyzed by descriptive statistics, correlations, and multiple linear regression analysis. The secondary data was analyzed by using stata for windows software package. Basically, descriptive statistical tools are used to analyze the mean, standard deviation, minimum and maximum values of the study.

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

3.5 Model Specification

From the research methodology, the model were 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), 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 examination.

Econometric model

$$ROA_{i,t} = \beta_0 + \beta_1(BS)_{i,t} + \beta_2(CA)_{i,t} + \beta_3(LTDR)_{i,t} + \beta_4(MGE)_{i,t} + \beta_5(GDP)_{i,t} + \beta_6(FDC)_{i,t} + \beta_7(FER)_{i,t} + \beta_8(INFR)_{i,t} + \varepsilon$$

Where:

$ROA_{i,t}$ is the dependent variable as a proxy for bank's profitability, for bank i at time t .

β_0 - constant
 β_1-9 – coefficients of the regression model and
 ε – Error term

3.5.1 Model Assumptions and Data properties

The following diagnostic tests were carrying out to make sure that the data fits the basic assumptions of linear regression models;

Normality Test

Normality test carry out to verify if the error terms are normally distributed. The JacqueBera (JB) test is use to find out definitely this assumption. The test is base 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 was correlated with the error term in any other time period.

Multi-co linearity Test

Detection is 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 multi-co linearity is a serious problem.

Hetero-scedasticity Test

Hetero-scedasticity occurs when the variance of the error term is not constant. The study use popular White's hetero-scedasticity Test. Gujarati (2004) asserts that the general test of hetero-scedasticity propose by White does not rely on the normality assumption and is easy to implement. The test was based on the null hypothesis that the variance of the errors is constant (homo-scedacticity).

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

	Variable	Measure	Notation	Exp. sign
Dependent variable	ROA	The ratio of net-profit to average total assets of bank	ROA	N/A
Independent variable	Bank Size	Natural logarithm of Total Asset of the bank	LBS	+
	Capital adequacy	The ratio of equity to total assets	CA	+
	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 Result and Discussion

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 2010-2017. 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.

4.2 Descriptive Statistics

The table 4.1 presents 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 Figure below.

Figure 4. 1 Descriptive Statistics of Variables

```
. sum ROA BS LTDR CA MGE FDC GDP INFR FER
```

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	48	3.316276	2.119391	.02	16.65
BS	48	10.06052	1.864732	8.655551	18.89172
LTDR	48	59.42381	7.137803	45.06	73.80083
CA	48	1.015896	.0851982	.958	1.575
MGE	48	1746.757	11284.79	32.28634	78300.52
FDC	48	.033996	.0426582	.0132	.31579
GDP	48	793175.5	434840.9	419218	1596482
INFR	48	13.59375	10.2408	7.3	38
FER	48	18.58687	3.159598	12.891	23.96

Source: computed from Stata 12 result

As shown in the Figure 4.1 above, the descriptive statistics of the study composed of 48 observations collected from six commercial banks in Ethiopia over the period of 2010 to 2017. The mean of return on asset (ROA) was 3.32 per birr for the sampled commercial banks in Ethiopia with a minimum of 0.02 and a maximum of 16.65 per birr. Therefore, the highest Ethiopian commercial banks achieved a profit of 16.65 cents per a birr invested in the asset. Whereas the least profitable bank of the sampled banks earned 0.02 per cents of profit after tax for every one birr invested in the company's assets. The standard deviation statistics for ROA was 2.12 per birr, which confirms that there was variation between banks' during the study period undertaken.

The natural logarithm values (LBS) were proxy to their total assets of sampled banks. The mean value of this variable was 10.061 per birr during the study period undertaken and have a standard deviation of 1.865 per birr. This indicates 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 8.66 and 18.89 per birr respectively.

Loan to deposit ratio (LTDR) ratio was the minimum and maximum value of 45.1 and 73.8, with a mean value of 59.42 which indicated that a relatively large deviation from the mean by 7.14 among the bank specific independent variables. On the other hand, the smallest standard deviation was recorded in funding cost which was 0.043 and shows the existence less variations among the banks in the sample under the study period.

The ratio of equity to total assets (CA) was a measure of bank capital adequacy with a mean value of 1.02 this implies that, the sampled banks in this particular study 1.02 of their fund needs satisfied through equity capital. The standard deviation ratio was 0.9 with 0.958 and 1.575 as minimum and maximum values respectively.

On the macroeconomic variables, the average growth rate of real GDP of Ethiopia for the last consecutive eight years was approximately 793175.5 with a minimum economic growth of 419218 and a maximum growth of reaching 1596482. The standard deviation registered in the period was 434840.9; it means that economic growth in Ethiopia during the period of 2010 to 2017 relatively stable. The exchange rate during the period of this study undertaken, exchanged on average of 18.58687 birr, the local currency. Foreign exchange appeared to be the most

volatile with a standard deviation of 3.4. Lastly, inflation mean is 13.594, with maximum rise in price recorded 38 and minimum 7.3. Standard deviation was 10.241.

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

Figure 4. 2 White test of Heteroscedasticity

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of roa

      chi2(1)      =      1.41
      Prob > chi2  =      0.2359
```

Source, Computed from Stata 12 result

If p-value of White test is less than 5%, the assumption of homoscedasticity is fulfilled and it will enable us to make best linear unbiased estimation (*BLUE*).

As we can see from the above result the p-value is not significant or not less than 5 percent, so we can understand that accepting the rejecting the null hypothesis is appropriate. According figure 4.2 shows that p value gives the result that there is evidence for the presence of Heteroskedasticity in the models. Not support the null hypothesis of homoscedasticity assumption.

4.3.2. Normality test

The model that include Normality test 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 Jarque--Bera 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 4.3, below the coefficient of kurtosis was close to 0.0000 and P-value of 0.000 which is less than 0.05 so, we can reject the null HO of normality test at the 5% level, Concluded that the data can not consistent with a normal distribution assumption and there is the problem of normality in the model.

Figure 4. 3 Normality test for residuals

```

: sktest residuals

```

Skewness/Kurtosis tests for Normality					
Variable	Obs	Pf(Skewness)	Pf(Kurtosis)	adj chi2(2)	joint Prob>chi2
residuals	48	0.0000	0.0000	67.29	0.0000

Source, output of Stata 12

4.3.3 Multicollinearity

multicollinearity test, was help to identify the correlation between explanatory variables and to avoid double effect of independent variable from the model. .Multicollinearity will occur when some or all of the independent variables are highly correlated with one another. If the multicollinearity occurs, the regression model is unable to tell which independent variables are influencing the dependent variable. According to Gujarati (2004), the standard statistical method for testing data for multicollinearity is analyzing the explanatory variables correlation coefficients (CC); condition index (CI) and variance inflation factor (VIF).

Figure 4.4 Multicollinearity test

```

: vif

```

Variable	VIF	1/VIF
CA	19.52	0.051237
MGE	16.39	0.061025
BS	5.05	0.197831
GDP	4.32	0.231716
FER	4.16	0.240596
LTDR	2.64	0.378780
INFR	1.35	0.741535
FDE	1.17	0.854060
Mean VIF	6.82	

Source, output of Stata 12

The results in the above vif command show that the highest tolerance was 0.85 which is between founding cost and capital adequacy 0.1. As noted by Hair et al. (2006) if the value of tolerance is less than 0.2 or less than 0.1 and simultaneously when the value of vif was 10 and above it the multicollinearity is problematic. The mean of vif is 6.82 it was less than 10 so; no problem of multicollinearity in the study.

4.3.4 Test for Autocorrelation

As shown in the below figure 4.3, the P value of statistic result of the model was 0.6695 which is above than the significance level of 5%. As a result, the null hypothesis which states residuals is no serially correlated. So no reject at 5 percent of significant level. This implying that there is no significant evidence for the presence of serial correlation in these models. In addition, the

Chi-Square P-value of the models also supports no the presence of serial correlation in the model. Therefore, there is no serial correlation among residuals.

Figure 4. 5 Autocorrelation test

```

. estat bgodfrey, lag(1)

Breusch-Godfrey LM test for autocorrelation

```

lags (p)	chi2	df	Prob > chi2
1	0.182	1	0.6695

H0: no serial correlation

Source, output of Stata 12

4.4, Correlation Analysis

The Correlation Analysis indicates that at what extent the explanatory variables are influential on the profitability indicators (ROA). The important issue from the equation (1) panel model is, it is not specified whether it is fixed effects or random effects model. So the focal point the researcher concern here is, to examine whether individual effects are fixed or random. Because, there are broadly two classes of panel data estimator approaches that can be employed in empirical research: fixed effects models and random effects models. This also requires the high concern when the researcher employed the panel data approaches.

Figure 4.6, Correlation Analysis test

```

: corr ROA BS LTDR CA MGE FDC GDP INFR FER
(obs=40)

```

	ROA	BS	LTDR	CA	MGE	FDC	GDP	INFR	FER
ROA	1.0000								
BS	0.5578	1.0000							
LTDR	-0.0339	-0.1971	1.0000						
CA	0.9027	0.7525	-0.0166	1.0000					
MGE	0.9205	0.6975	-0.0085	0.9673	1.0000				
FDC	-0.0792	-0.0886	0.1417	-0.0544	-0.0482	1.0000			
GDP	-0.2154	0.2594	0.4097	0.0010	-0.0373	0.2743	1.0000		
INFR	0.1000	-0.1393	-0.4040	-0.0694	-0.0428	-0.1403	-0.3635	1.0000	
FER	-0.0977	0.3310	0.4989	0.1075	0.0669	0.1923	0.8461	-0.3153	1.0000

Source, output of Stata 12 result

With our bank specific variables, management efficiency (MGE), capital adequacy (CA) and Growth domestic product (GDP) are relatively, highly impacting on ROA as indicated in figure 4.6 above. MGE and CA was the most positively correlated variable with ROA. This shows that, when the management efficiency and capital adequacy increases, profitability also increases. On the other hand, growth domestic product (GDP), the ratio of interest expense to total deposit (FDC), loan to deposit ratio (LTDR) and foreign exchange rate (FER) seems to be inversely correlated with the ROA.

4.5, Model selection test: Random model versus fixed effect model

To analyze the internal and external or 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 modeling enables to explain a common group of characteristics while, 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 selected model is random effects and the alternative states that the fixed effects is selected.

Figure 4.7 Husman test

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) Fixed	(B) Random		
BS	-.145363	-.0289909	-.1163721	.2864761
LTDR	.0152157	.0372789	-.0220632	.0112828
CA	6.1593	7.577294	-1.417994	2.903985
MGE	.0001449	.0001235	.0000213	:
FDC	-.1907131	1.018427	-1.20914	.9106695
GDP	=5.83e=07	=7.37e=07	1.54e=07	:
INFR	.0209297	.0256069	-.0046772	:
FER	-.0169341	-.0439705	.0270364	.0292329

b = consistent under H0 and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under H0; obtained from xtreg

Test: H0: difference in coefficients not systematic

$\chi^2(6) = (b-B)'[(V_b-V_B)^{-1}](b-B)$
 = 710.01
 Prob>chi2 = 0.0000

Source stata 12 result output

Since according to the p-value of the Hausman test result is significant depends on this the study reject the null hypothesis. So, the study used selected fixed effect model than random effect model.

4.5.1, fixed effect regression result

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

Figure 4.8 Results of the regression based on Fixed Effect method

Fixed-effects (within) regression		Number of obs	=	48		
Group variable: Banks		Number of groups	=	6		
R-sq: within = 0.9278		Obs per group: min	=	8		
between = 0.7695		avg	=	8.0		
overall = 0.9134		max	=	8		
corr(u_i, Xb) = 0.0598		F(8,34)	=	54.59		
		Prob > F	=	0.0000		
ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
BS	-.145363	.3097991	-0.47	0.642	-.7749505	.4842245
LTDR	.0152157	.0249605	0.61	0.546	-.0355103	.0659416
CA	6.1593	5.844273	1.05	0.299	-5.717692	18.03629
MGE	.0001449	.0000348	4.16	0.000	.0000741	.0002157
FDC	-.1907131	2.642885	-0.07	0.943	-5.561701	5.180275
GDP	-5.83e-07	4.62e-07	-1.26	0.216	-1.52e-06	3.56e-07
INFR	.0209297	.0108876	1.92	0.063	-.0011966	.043056
FER	-.0169341	.0695523	-0.24	0.809	-.1582814	.1244132
_cons	-2.13623	5.059584	-0.42	0.676	-12.41854	8.146081
sigma_u	.32770972					
sigma_e	.64165357					
rho	.20687917	(fraction of variance due to u_i)				

Source stata 12 output result

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

$$ROA = -2.14 - 5.05(-1.5BS) - 0.3 + 0.015LTDR - 0.025 + 6.2CA - 5.8 + 0.0001MGE - 0.0004 + (-0.2FDC - 2.64 + (-5.83GDP) - 4.62 + 0.021NFR - 0.11 + (-0.017FER) - 0.7$$

Significant of the model is tested, accordingly, figure 4.8 of linear regression indicated that the regression model predicts the outcome variable significantly with the p-value of (0.000),

The value of R-squared statistics and the Adjusted-R squared statistics of the model was 91.34 % and 93% respectively. The R-squared results indicate that 91.34% variation in the dependant

variable (ROA) is described by the explanatory variables of the commercial bank in Ethiopia and the remaining 7% 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.

Based on the results shown above, all bank-specific independent variables except inflation rate significant at 10% (p-value 0.063) and management efficiency significant at 5% (p-value 0.0001) other variables had statistically insignificant impact on profitability. capital adequacy (CA), funding cost (FDC), loan to deposit ratio (LTDR), foreign exchange rate (FER), bank size (BS) and Growth domestic product (GDP) all were insignificant.

The output also shows that the coefficient of Bank size (BS), FER, FDC and GDP against ROA were negative with the coefficients of -0.145, -0.0169, -0.19 and -5.83 respectively. This described as; there was an inverse relationship between the aforementioned four 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 (INFR), and capital adequacy (CA) had a positive relationship with profitability as indicated a coefficient of 0.015, 0.000145, 0.0209, and 6.2. This clearly shows that there was a direct relationship between the above listed five explanatory variables and ROA.

Bank Size (BS)

Size is used to capture the impact of bank size on profitability, and is measured as the logarithm of (BS) total assets. The result indicates that size is negatively related to profitability and statistically insignificant at 5%, and 10% significance level (p-value = 0.642). However, the coefficient -0.143 indicates that when the log of the bank size increase by 1 unit, the other things remains constant profit (ROA) of the bank will minimize by 0.143%. The result of study is in line with Ani et al cited (2012) the size has a significant negative relationship with profitability. This significant negative relationship shows that the size of a bank could significantly affect the profitability of the bank negatively. The major outcome of this study is that higher total assets may not necessarily lead to higher profits.

Loan to Deposit (LTDR)

Concerning the impact of loan to deposit ratio, the result of the regression output shows that, it is in significance at 5% and 10% significance level ($p\text{-value}=0.545$) and has a positive impact on profitability (ROA). This means, it describes that per one Birr given as a loan from a deposit has the effect of 0.0015 cents on bank's profitability in Ethiopia. The result of this study is also opposite with the finding of Moges (2017) that argued there is a negative and significant association among LTDR and bank profitability. The result is line with Abreu and Mendes (2000), SehrishGul et al(2011) and Athanasoglou et al. (2006) gives evidence of a positive association between loan ratio and bank profitability

Capital adequacy

Capital adequacy statistically insignificant at the 5% and 10% significance level ($p\text{value}=6.2$) and have direct relationship with profit. The result is in line with Bourke (1989), Hassan and Bashir (2003), Samuel (2015), 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. And it was contrary with Weersainghe & Perera (2013), determinants of profitability of commercial banks in Sri Lanka. Similarly, Tesfaye (2014), who studied the determinants of Ethiopian commercial banks negative relationship with profitability.

Management Efficiency

Management efficiency has a positive and statistically significant impact on bank profitability. The result shows that, a positive coefficient of 0.000145 and significant at 5% significance level ($p\text{-value} =0.00001$). The outcomes imply that, an increase (decrease) in the expenses results, decrease (increases) the profits of banks. The empirical finding of this study is also contrary or contradicts 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.

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 insignificant at 5% and 10% significant level (p-value=0.943). The results imply that, an increase or decrease in funding cost has an effect of increases or decrease profits. It was line with the study conducted by Samuel (2015) FDC had a negative impact on bank profitability.

Real GDP

GDP was statistically insignificant at 5% and 10% significance level (p-value 0.216) and has a negative relationship with profitability. The coefficient of -5.83 in the regression output indicates that GDP was significant determinant of banks profitability in Ethiopia under the study period. The results show that one-unit increase in GDP will contribute -5.83 unit decreases in return on assets (ROA). 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.

Inflation rate (INFR)

Another important macroeconomic condition that affects profitability was inflation rate. It had statistically significant at 10%. The coefficient 0.0209 indicates 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 0.0209 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 0.063. Thus, the hypothesis that stated earlier, there is no significant relationship between inflation and profitability will be rejected

Foreign exchange rate (FER)

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 negative or inverse relationship between foreign exchange rate and profitability of Ethiopian banks. The coefficient of foreign exchange rate was negative (-0.0169) and p-value (0.809) 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. The result was contradict 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.

Table 4.1 Description of the variables and their expected relationship

Explanatory variable	Expected impact	Actual impact on ROA
BS	Positive	Negative and insignificant
LTDR	Positive	Positive and insignificant
CA	Positive	Positive and insignificant
MGE	Positive	Positive and significant
FDC	Negative	Negative and insignificant
GDP	Positive	Negative and insignificant
INFR	Negative	Positive and significant
FER	Positive	Negative and insignificant

CHAPTER FIVE

5, Conclusion and Recommendation

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

5.1 Summary of Finding

The secondary data used in this analysis covered a period of 8 years from 2010 to 2017. The banks that were sampled were 6 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 management efficiency (MGE) and inflation rate (INFR) the other were found to be insignificant in determining profitability. The results indicate that management efficiency had a positive and significant impact on bank profitability. Funding cost and bank profitability, funding cost measured in terms of the ratio of interest expense to total deposit has insignificant negative impact on bank profitability. This implies as the funding cost increases the profitability of the bank decrease. The study also found insignificant positive relationship between loans to deposit ratio and bank profitability. The regression result showed that capital adequacy and loan to deposit ratio 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 raise, profitability raise. 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 insignificant effect on banks profitability and exchange rate has also negative and insignificant effect on profitability.

5.2, Conclusion

The study discourse or examine the determinants that influence and impact on bank profitability and to find out to what a range of values these determinants influence the Ethiopian banks profitability. The determinants were explained in to two main categories; the internal determinants and the external determinants. The internal determinants refer to the determinant 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 or factors are variables that are not related to bank management but are related to the economic and legal environment that affects the operation and profitability of the firms.

This study examines 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 (BS), management efficiency (MGE), loan to deposit ratio (LTDR), capital adequacy (CA) and funding cost (FDC). While, as external determinants are used three variables gross domestic product (GDP), foreign exchange rate (FER) and inflation rate (INFR). Moreover, the study used Return on Asset (ROA) as the main measure of bank profitability.

The study found a capital adequacy ratio has positive and statistically insignificant impact on ROA of commercial banks in Ethiopia. This indicates banks with strong capital adequacy or keep the fund in the bank will have no cost and the bank will no loss the profit

The result showed a negative relationship between funding cost and profitability with statistical insignificance. This shows that as maximizing commercial banks interest expense in Ethiopia would certainly decrease the banks profitability.

Loan to Deposit has positive and statistically insignificant impact on ROA. this result shows that the bank charge more than what the bank making as interest expense for the depositors and the more loan the bank give will have a insignificant effect on banks profitability.

The bank size and profitability had insignificant negative 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.

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

In general, the result or finding management efficiency, and inflation rate 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, loan to deposit ratio, bank size, funding cost, GDP 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, capital adequacy and inflation rate was found to be positive and for GDP, bank size, funding cost and foreign exchange rate the relationship were negative.

5.3, Recommendation

Depends on the findings and conclusions of the study the following recommendations were forwarded.

The regression results in this research imply Management efficiency was significant key internal drivers of profitability of commercial banks in Ethiopia. Actually, focusing and redesign the firms together with these indicators could increase 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.

Recommended to increase their profitability by disbursing more loans and improving loan collection mechanisms such as lending for feasible projects and holding collateral. Beside this, bank managers should reduce their operating expenses in order to maximize profitability of the

banks. This means that Commercial banks need to invest on efficient management and technologies that reduce costs of operations in order to enhance their performance.

Among the macroeconomic variables included in this study, only inflation rate (INFR) exists as a significant key driver of profitability of Ethiopian commercial banks. The government monetary policy should consider the effect of money supply on the profitability of commercial banks in Ethiopia. Therefore banks should not ignore the macroeconomic indicators when strategizing to improve on their profits or performance. Thus, banks in Ethiopia should not only be concerned about internal structures and policies, but they must consider both the internal environment and the macroeconomic or external environment together in fashioning out strategies to improve their performance or profits.

Future research recommendation

The study required to examine the factors that affect profitability of commercial banks in Ethiopia. However, the variables used in the statistical analysis did not include all factors like; Expense Management, Interest Income, Liquidity Management, Net Interest Margin, Revenue Diversification, Return on Equity, Consumer Price Index, Concentration, Liquidity, Broad Money Supply, Return on Invested Capital and etc that affect Ethiopian banks profitability. In this study analysis method is stata software. Thus, future research could incorporate external factors and internal factors that explain in the above and analyse by other method like by eview software.

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Appendixes

Appendix: 1 list of commercial banks and year of establishment.

S/N	Name	Year of Establishment
1	Awash International Bank	1994
2	Bank of Abyssinia	1996
3	Commercial Bank of Ethiopia	1963
4	Nib International Bank	1999
5	United Bank	1998
6	Wegagen Bank	1997

Appendix 2 Raw data

Banks	year	ROA	BS	LTDR	CA	MGE	FDC	GDP	INFR	FER
1	2010	3.06	11.214343	47.82	1	174.3349531	0.014	419218	7.3	12.891
1	2011	3.22	11.646275	45.06	1	178.9838615	0.0132	475648	38	16.118
1	2012	3.82	11.9754917	53.85	1	194.7477234	0.0144	517027	20.8	17.254
1	2013	3.32	12.191488	49.49	1	138.4528201	0.01559	568432	7.4	18.195
1	2014	3.1	12.3900945	48.29	1	122.3150307	0.01787	626977	8.5	19.075
1	2015	16.65	18.8917221	59.12	1.575	78300.51998	0.0204	692222	10.45	20.096
1	2016	0.02	12.8580143	50.06	1	72.26814039	0.0223	1449398	7.5	21.106
1	2017	2.3	15.8577057	54.71	1.1	62.92955693	0.025214	1596482	8.8	23.96
2	2010	3.4	8.98027039	51.51844786	1	211.8743265	0.0254	419218	7.3	12.891
2	2011	4	9.22185186	51.47956831	1	250.1537523	0.03	475648	38	16.118
2	2012	3.577125	9.38737135	59.80440131	1	149.7437287	0.031	517027	20.8	17.254
2	2013	3.788397	9.60634897	61.45771847	1.1	126.2503033	0.02891	568432	7.4	18.195
2	2014	3.542828	9.90492587	61.01418551	1	134.8457912	0.032	626977	8.5	19.075
2	2015	2.940148	10.0803613	67.39609941	1	104.816783	0.0345	692222	10.45	20.096
2	2016	2.781511	10.295854	67.6715081	1	85.34361393	0.03424	1449398	7.5	21.106
2	2017	2.803329	10.6448262	73.80083293	1	78.45706716	0.02988	1596482	8.8	23.96
3	2010	4.113004	8.65555067	63.06398881	1	184.8602313	0.02	419218	7.3	12.891
3	2011	4.684208	8.99479848	48.84696214	1	194.8839058	0.01682	475648	38	16.118
3	2012	4.09855	9.02967532	61.92365015	1	162.0839202	0.0243	517027	20.8	17.254
3	2013	3.663817	9.24896446	62.1156511	1	112.2313131	0.02283	568432	7.4	18.195
3	2014	2.818393	9.32746337	54.9159411	1.03	93.31718598	0.0274863	626977	8.5	19.075

3	2015	2.824789	9.52597982	61.51301233	1	81.13906557	0.0294992	692222	10.45	20.096
3	2016	2.512445	9.69209728	67.75452011	1	71.47349777	0.031	1449398	7.5	21.106
3	2017	2.865848	9.94985388	73.01256349	1	82.42118045	0.0333	1596482	8.8	23.96
4	2010	2.391633	8.74505137	61.3609359	1	142.5112527	0.024774	419218	7.3	12.891
4	2011	2.669048	8.89260574	54.57690103	1	125.5268986	0.02695	475648	38	16.118
4	2012	2.788032	9.01669603	57.55637855	1	99.79827472	0.030784	517027	20.8	17.254
4	2013	2.355245	9.22319431	55.34361109	1	99.79827472	0.024535	568432	7.4	18.195
4	2014	4.18038	9.33046617	55.63702911	1	130.5538984	0.034751	626977	8.5	19.075
4	2015	2.339174	9.52277962	53.11328747	1	76.49228227	0.033356	692222	10.45	20.096
4	2016	2.364727	9.73080325	58.75783024	1	75.09978878	0.0332	1449398	7.5	21.106
4	2017	2.705928	10.1395392	67.27871035	1	74.88892843	0.0289567	1596482	8.8	23.96
5	2010	3.3	8.68206827	55.31620885	1	163.6135635	0.0221	419218	7.3	12.891
5	2011	3	8.95229671	54.0232951	1	178.7537077	0.0238777	475648	38	16.118
5	2012	4	9.08101225	60.45678929	1	138.203587	0.0294	517027	20.8	17.254
5	2013	2	9.20810477	58.42100544	1	86.29973163	0.031	568432	7.4	18.195
5	2014	2	9.38230557	56.93019446	0.958	60.88078312	0.031256	626977	8.5	19.075
5	2015	2	9.57226229	58.1148286	1	65.41525598	0.032687	692222	10.45	20.096
5	2016	2	9.75671859	65.45936995	1	62.23514593	0.04	1449398	7.5	21.106
5	2017	2	9.99437524	72.68222343	1	32.28634177	0.03846	1596482	8.8	23.96
6	2010	3.728065	8.69458713	61.69177699	1	159.8515059	0.022	419218	7.3	12.891
6	2011	3.76752	8.86947156	53.64179625	1	167.6316798	0.0232	475648	38	16.118
6	2012	3.720417	9.02107823	63.52893363	1	149.4132443	0.02602	517027	20.8	17.254
6	2013	3.437026	9.12091229	68.26216461	1	102.2235253	0.077899	568432	7.4	18.195
6	2014	2.989862	9.28240789	68.2511724	1	101.8525642	0.02334	626977	8.5	19.075
6	2015	2.808552	9.49221476	70.53369748	1	68.60058914	0.031	692222	10.45	20.096
6	2016	2.680178	9.66968597	60.46825486	1	53.02545441	0.31579	1449398	7.5	21.106
6	2017	3.702314	9.95321594	65.24743649	1	60.92082138	0.03233	1596482	8.8	23.96

Appendix-3 Regression output

Fixed-effects (within) regression		Number of obs	=	48		
Group variable: Banks		Number of groups	=	6		
R-sq: within	= 0.9278	Obs per group: min	=	8		
between	= 0.7695	avg	=	8.0		
overall	= 0.9134	max	=	8		
F(8,34)		=	54.59			
Prob > F		=	0.0000			
COEFF(u_i, Xb)		=	0.0598			

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
BS	-.145363	.3097991	-0.47	0.642	-.7749505	.4842245
LTDR	.0152157	.0249605	0.61	0.546	-.0355103	.0659416
CA	6.1593	5.844273	1.05	0.299	=5.717692	18.03629
MGE	.0001449	.0000348	4.16	0.000	.0000741	.0002157
FDE	-.1907131	2.642885	-0.07	0.943	-5.561701	5.180275
GDP	-5.83e-07	4.62e-07	-1.26	0.216	-1.52e-06	3.56e-07
INFR	.0209297	.0108876	1.92	0.063	-.0011966	.043056
FER	-.0169341	.0695523	-0.24	0.809	-.1582814	.1244132
_cons	-2.13623	5.059584	-0.42	0.676	-12.41854	8.146081

sigma_u	.32770972					
sigma_e	.64165357					
rho	.20687917	(fraction of variance due to u_i)				

Appendix –4: Tests for Heteroskedasticity: White

```

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of roa

chi2(1) = 1.41
Prob > chi2 = 0.2359

```

Appendix 5: Tests for autocorrelation: Breusch-Godfrey

```

: estat bgodfrey, lag(1)

Breusch-Godfrey LM test for autocorrelation

```

lags (p)	chi2	df	Prob > chi2
1	0.102	1	0.6695

H0: no serial correlation

Appendix-6: Tests for Multicollinearity

```

: vif

```

Variable	VIF	1/VIF
CA	19.52	0.051237
MGE	16.39	0.061025
BS	5.05	0.197831
GDP	4.32	0.231716
FER	4.16	0.240596
LTDR	2.64	0.378780
INFR	1.35	0.741535
FDC	1.17	0.854060
Mean VIF	6.82	

Appendix - 7: Tests for Normality test

```

: sktest residuals

```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
residuals	48	0.0000	0.0000	67.29	0.0000

Appendix – 8: Descriptive Analysis of dependent and independent variables

```

: sum ROA BS LTDR CA MGE FDC GDP INFR FER

```

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	48	3.316276	2.119391	.02	16.65
BS	48	10.06052	1.864732	8.655551	18.89172
LTDR	48	59.42381	7.137803	45.06	73.80083
CA	48	1.015896	.0851982	.958	1.575
MGE	48	1746.757	11284.79	32.28634	78300.52
FDC	48	.033996	.0426582	.0132	.31579
GDP	48	793175.5	434840.9	419218	1596482
INFR	48	13.59375	10.2408	7.3	38
FER	48	18.58687	3.159598	12.891	23.96

Appendix 9 correlation analysis

```

: CORR ROA BS LTDR CA MGE FDC GDP INFR FER
(obs=48)

```

	ROA	BS	LTDR	CA	MGE	FDC	GDP	INFR	FER
ROA	1.0000								
BS	0.5578	1.0000							
LTDR	=0.0339	=0.1971	1.0000						
CA	0.9027	0.7525	=0.0166	1.0000					
MGE	0.9285	0.6975	=0.0085	0.9673	1.0000				
FDC	=0.0792	=0.0886	0.1417	=0.0544	=0.0482	1.0000			
GDP	=0.2154	0.2594	0.4897	0.0010	=0.0373	0.2743	1.0000		
INFR	0.1000	=0.1393	=0.4040	=0.0694	=0.0428	=0.1403	=0.3635	1.0000	
FER	=0.0977	0.3310	0.4989	0.1075	0.0669	0.1923	0.8461	=0.3153	1.0000