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**THE EFFECT OF CREDIT RISK MANAGEMENT ON
THE
PROFITABILITY PERFORMANCE OF
COMMERCIAL BANK OF ETHIOPIA**

BY HIWOT ZEMEDKUN

**A RESEARCH PROJECT SUBMITTED TO DEPARTMENT OF MANAGEMENT
COLLEGE OF BUSINESS AND ECONOMICS (COBE) FOR PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MBA DEGREE
IN BUSINESS ADMINISTRATION FINANCIAL SERVICES.**

**ADDIS ABABA UNIVERSITY
ADDIS ABABA, ETHIOPIA
MAY, 2019**

DECLARATION

I hereby declare that this study entitled “The Effect of Credit Risk Management on the Profitability Performance of Commercial Bank of Ethiopia” is my original work prepared under the guidance of my advisor Dr. Baymot Tadesse. This paper is submitted in partial fulfillment of the requirement for the award of Master’s Degree in Business Administration-Financial Services and it has not been previously submitted to any college or university.

By: Hiwot Zemedkun

Signature -----

Date-----

LETTER OF CERTIFICATION

This is to certify that Hiwot Zemedkun carried out her study on the topic entitled “The Effect of Credit Risk Management on the Profitability Performance of Commercial Bank of Ethiopia”. This work is original in nature and suitable for submission for the award of the Master’s Degree in Business Administration-Financial Services.

Dr. Baymot Tadesse _____
(Advisor) Signature Date

ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS

This is to certify that the project prepared by Hiwot Zemedkun, entitled: The Effect of Credit Risk Management on the Profitability Performance of Commercial Bank of Ethiopia submitted in partial fulfillment of the requirements for the Degree of Master of Business Administration -Financial Services complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Acknowledgement

First and foremost I want to thank the almighty God for giving me the opportunity to advance my studies, provided the finances and gave me the strength to finish this research work. Special gratitude goes to my advisor Dr. Bayimot Tadesse for his guidance and constructive critiques throughout.

I am grateful to my friend Woy. Mehret Alazar for her unlimited support though out the whole process. I would also like to thank my Organization CBE for bringing this opportunity. Finally, I acknowledge the great moral support of my family (Mother, Husband and Daughters) who allowed me to pursue this project.

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Operational key terms

ROA – Return on Asset

ROE – Return on Equity

CAR – Capital adequacy Ratio

CLA – Cost Per Loan Asset

NPL – Non – Performing Loan

NPLR – Non - performing Loan Ratio

NI – Net Income

NII – Non – Interest Income

MEM – Management Efficiency

TL – Total Loan

TA – Total Asset

RWA – Risk Weighted Asset

TA – Total Asset

LOTA – Bank Size (Logarithm of total asset)

CBE – Commercial Bank of Ethiopia

DBE – Development Bank of Ethiopia

Abstract

The objective of the study was to assess the Effect of Credit Risk Management on the Profitability Performance of Commercial Bank of Ethiopia proxied by ROA and ROE, The study used a secondary data for the period between 2000 to 2018 for nineteen(19) years. The data was collected from CBE MIS Department, CBE Annual Report and National Bank of Ethiopia (NBE). The collected data was analyzed by using Time Series data regression model and EView7 software to regress the data , the result showed that credit risk management which is measured by non- performing loan to total loan ratio, and management efficiency that is measured by the ratio of operating expense to total income have negative and significant effect on both dependent variables (ROA and ROE). The other independent variables (CAR, TLTA, NII&LR) are insignificant. The study recommended that the bank's credit risk management needs strong attention & follow up regarding performer capacity building and to review their credit policy & procedure in order to minimize high incidence of NPL. This is because it has significant & negative effect on the profitability of the bank, and also Management efficiency result shows that there is a lack of efficiency in expenses management since banks pass part of increased cost to customers and the remaining part to profits. Therefore, the CBE should also give more attention in reduction of expenses to improve its profitability of the industry.

Keywords: Commercial Banks of Ethiopia. Credit Risk Management, Profitability,

CHAPTER ONE

1. INTRODUCTION

1.1 Back ground of the study

Banks are financial intermediaries in the economy. They accept funds from the surplus (depositors) and distribute to those who have funding gap (borrowers). By bridging funding gap between savers and borrowers, financial systems open up opportunities for the two parties and thereby helping entrepreneurs to enter to the market. Therefore, the economy at large will benefit through increased investment and creation of employment. Thus, economies need well-functioning financial institutions to ensure overall economic development.

Banks are exposed to different kinds of risks through their operation, according to Chijoriga (1997). Credit Risk is the most expensive in financial institutions and its effect is more significant as compared to other

r risks as it directly threatens the solvency of financial institutions. The magnitude and level of loss caused by the credit risk as compared to other kind of risks is severe to cause high level of loan losses and even bank failure. Different studies in the context of banking crisis across the world uncover the fact that poor credit (asset quality) is the primary cause of failure of banks (Saeed & Zahld, 2016). Once credit is made, there is a probability that the borrower or counterparty may fail to meet their obligations. Therefore, credit risk is inbuilt in banking. Credit risk can arise due to a number of reasons, such as absence of inadequate loan collaterals, poor loan processing, ineffective credit risk management, excessive intervention during loan processing, etc. The magnitude of credit risk depends on the probability of default counterpart (Afriyie & Akotey, 2011).

Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage

the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization (Brown and Moles).

Credit is the primary source of revenue for any bank around the world. However the probability of default borrowers' loan commitments has been an increasing concern for those banks. This risk could be categorized as credit risk. The risk poses a significant exposure not only to the banks (lenders) but also to the entire economy, which is evident in 2008 financial crises. This is because of the fact that the banking is a vital industry of any economy. This emphasizes the importance of managing the credit risk within the banking sector. Banks grant loans to the customer with an expectation of receiving the capital together with an interest. A loan facility is considered to be performing if payment of both capital and interest are paid accordingly with agreed repayment terms. The Non-Performing Loans (NPL) represents credits which the banks perceive as possible loss of funds due to customers failure to repay the monthly installments. They are further classified into Substandard, Doubtful and Loss Bank Credit. This category hinders bank from achieving their set targets. Proper risk Management is essential for the survival of a bank, and it enables management to allocate resources to risk units based on a tradeoff between risks and return potential (Charles & Kenneth, 2013).

Mekasha (2001) investigated credit risk management and its impact performance on Ethiopian Commercial Banks. The researcher used 10 years panel data from the selected commercial banks for the study, to examine the relationship between ROA and loan provision, non-performing loans and total assets. The study revealed that there is a significant relationship between bank performance and credit risk management.

Therefore, the main objective of this study is to investigate the effect of credit risk management on the profitability performance of commercial bank of Ethiopia (CBE) by using two performance measurement variable which is ROA and ROE.

1.2 Back ground of Commercial Bank of Ethiopia

Commercial Bank of Ethiopia (CBE) is the biggest and state owned bank in Ethiopia with deposit customers of more than 18.8 million in June, 2018. CBE is the leading bank in the industry in terms of its share of deposit, asset, loan and advances and branch network with share 65%, 65%, 54% and 32% as of June 2017. The bank is also supporting the public and the private sector through availing credit. The bank is supporting the government infrastructure and other public investments through providing credit. The private sector especially the priority sectors of manufacturing and exports are supported by the bank through credit at lower interest rate from the market.

The Commercial Bank of Ethiopia has historically been playing large roles in the Ethiopian economy. The role of the CBE in the development of the country in particular has been scaled up in the recent past, during which it has clearly articulated its mission of supporting the development process of the country. In light of this, it is the intention and objective of the management as well as the government to pursue that the CBE be profitable as well as competitive in the sector.

When banks are profitable, they are stable which in turn maintains the stability of the whole economy. Profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. Thus knowledge of the underlying factors that influence the banks' profitability is essential input for both bank managers and policy makers.

During the recent years, loan disbursement grew rapidly, in accordance with the growing demand for credit at national level. The total outstanding loans and advances reached Birr 482 billion at the end June 2018 increasing on average 24% in the last four years. The bank has also enjoyed increasing profit in these years though at declining rate of increase. Since significant part of the bank's asset (about 80%) is held in the form of loans and advances and interest income accounts for the major source of income, it means credit risk is the major source of risk for the bank. Therefore, by considering the importance of credit risk management for the bank, it is necessary to assess its impact on the profitability of the bank.

1.3 Statement of the Problem

Profitability is the primary goal of any business. Profitability is vital for existence, survival, and continuity of any business. Profitability refers to the ability of an organization to be profitable year to year. Profitability is necessary for any organization including banks to maintain ongoing activity and for its shareholders to obtain fair returns. As banks are the catalyst for growth and development of an economy, their profitability has wide impact on the whole economy. When banks are profitable, they are stable which in turn maintains the stability of the whole economy (Ongore and Kusa, 2013).

Main source of a bank profit is the net interest it earns on its assets. Thus, the major earning assets of a bank are its loans to individuals, businesses, and other organizations. The profitability of banks is influenced by different factors where risk management is cited as one by different literatures (Ongore and Kusa, 2013).

Credit risk is the commonly identified as the greatest risk for banks' profitability as credit is their major source of earning revenue. Credit risk in banks arises due to default by borrowers. Borrower might default to repay the principal and interest timely due to different reasons. The borrower may be in a financial stressed situation and may be facing bankruptcy. It can also refuse to comply with its obligation of debt service in the case fraud or legal dispute (Fan LiYijunZou Umeå, 2014). These are the reasons for credit risk in banks which arises due to counterparties in loan transaction default. Moreover, the recovery rate that is how much can be retrieved if a default takes place; show that banks is exposed to credit risk. Other than individual borrower default risk, banks also face another area of credit risk which is concentration risk. Concentration risk arises when there are a large number of exposures to parties that share similar characteristics (Ken Brown and Peter Moles , 2016). If there is high concentration of loans to specific sector, some kind of economic shock to that sector may affect the repayment of loans.

Banks issue more loans to generate more interest income and earn high profit (Abreu and Mendes, 2002). There are cases in which banks issue high risk-loans without due diligence that their return cannot be guaranteed. Magali (2014) mentioned that when credit risk management is conducting in improper approach, then overdue loans

occur. When unpaid loans accumulate, the bank's return will be lower as the bank increases the provision it holds allocating a significant portion of its gross margin. On the other hand, the bank may charge high interest rates to high-risk loans and if the returns can cover the high risks, profitability may increase. Furthermore, the credit assessment and management input will cost less if the loans are well priced considering the risk (Ruochoen, 2014 & Xuan, 2010). Thus, how well the bank manages its credit risk management impact profitability.

Thus, the effective management of credit risk is essential to the long-term success of any banking organization. Credit risk management includes establishing an appropriate credit risk environment; sound credit granting process supported by procedure; and maintaining an appropriate credit administration, measurement and monitoring process.

Hence, examining the effect of credit risk management on financial performance of banks in Ethiopia is vital to check the situation in the industry. Literatures on Ethiopian banking sector documented that credit risk and non-performing loan have been major challenges of bank performance in Ethiopian (Misiker, 2015).

A thorough review of the literature indicates that only a very few study has been undertaken on credit risk management and bank's profitability performance in Ethiopian commercial banks. Moreover; studies that should have been carried out giving high focus on the Commercial Bank of Ethiopia, which is the biggest and leading bank in the country, are missing. Thus, this research paper tried to fill the gap by using two known performance measurement variables (ROA & ROA), by talking long year's data 2000 to 2018 (19 years) and by focusing on CBE to assess the effect of credit risk management on the profitability performance of this bank.

1.4 Objective of the study

The objective of this study is to assess the effect of Credit Risk on the profitability performance of Commercial Bank of Ethiopia.

1.5 Specific Objective of the study

The specific objectives of the study are:

- To assess the credit risk management of the bank;
- To assess the profitability of the bank;
- To assess the impact of credit risk management of the bank on its profitability;

1.6 Research Question

This study tried to answer the following questions:

- What is the effect of Non-Performing Loan (NPL) with in Return on Equity (ROE) and Return on Asset (ROA)?
- What is the effect of credit risk management on profitability performance of Commercial Bank of Ethiopia from 2000 to 2018?

1.7 Scope of the study

The Scope of the study is limited to Commercial Bank of Ethiopia (CBE), the state owned commercial bank which is working almost in all direction of the country. The researcher believes that it can represent all the pictures of the country. This paper specifically focused on the effect of credit risk management on the profitability performance of only Commercial Bank of Ethiopia by using data year from 2000 to 2018.

1.8 Significance of the study

This Project paper may support the policy makers and management of the bank in their decision. It can also be used as a source of literature for other scholars who intend to carry out further research on the effect of risk management on profitability with specific reference to banking institutions.

1.9 Limitation of the study

The financial sector of the country includes commercial banks, development bank and micro-finance institutions. There are about 18 commercial banks operating in Ethiopia. This study assessed the effect of credit risk management on the profitability performance of only Commercial Bank of Ethiopia for the years 2000-2018, ignoring others private banks, micro-finance institutions and Development bank of Ethiopia (DBE) due to the scope of the paper.

1.10 Organization of the study

Chapter One of the studies present background of the study, statement of problem, general and specific objective of the study, research question, scope of the study, significance of the study and limitation of the study. In Chapter Two, various literatures on theoretical and empirical studies were reviewed and summarized with their methodologies and also conceptual frame work included. The Third Chapter deals with the Research approach and Design, Target population, Research Methodology, Model specification and variable description explained. Chapter Four focuses on data analysis and the result of the regression finding. Finally, Chapter Five summarizes the study, Conclude and Recommends the finding.

CHAPTER TWO

2. LITERATURE REVIEW

This section discussed some Empirical and Theoretical literature on the effect of credit risk management on the profitability performance.

2.1. Theoretical Review

2.2. Risk

Risk is “the variability of the actual return from the expected returns associated with a given asset or investment” (Khan & Jain, 2004). Ehrhardt & Brigham (2011) also defined risk as “the chance that some unfavorable event (both financial and physical) will occur”.

Risk arises from negligence, failure to monitor processes and flaws in execution. Risk management is mainly focused on reducing earning volatility and avoiding large losses. Managers need reliable risk measures to direct capital to activities and estimate the size of potential losses to stay within limits imposed by available capital, creditors and regulators (Pyle, 1997). Thus, risk management is all about identifying key risk areas, determining tolerance, deciding how to minimize them and monitoring them to maintain at low level or below tolerance level.

The focus on risk has increased over the years with increased regulations compelling banks and other financial institutions into adopting risk based measures and practices. These have not been their challenges in particular as risk is difficult to quantify and according to Bess (2002) may not be visible until it begins to degenerate into a loss. However more and more banks globally are integrating risk and risk management process into their system, arguably though the extent of implementation is more based on compulsion than on the perceived need to do it.

According to Koch and MacDonald (2009) banks’ risks can be identified as six types: credit risk, liquidity risk, market risk, operational risk, reputation risk and legal risk. Each of these risks might generate harmfully influence the financial Institution’s

probability, market value, liabilities and shareholder's equity. The sources of these risks are briefly explained below.

- **Liquidity risk** can be described as the risk of funding which is related to an unexpected event, for example large charge off or currency crisis (Santomero, 1997). Specifically, a bank is reducing the ability to meet expected and unexpected current and future cash flows which indicates the liquidity risk (The Joint Forum, 2006). Or it is unable to meet collateral needs without impacting regular operations and financial condition of the institutions (The Joint Forum, 2006).
- **Market risk** can be hedged but cannot be diversified completely away. In fact, it can be regarded as a non-diversifiable risk. It comes from many different forms such as variation in interest rate and relative value of currencies (Santomero, 1997).
- **Operational risk** relates to the issues of precisely processing, settling and taking delivery on trades for the exchange of cash. It also involves the record keeping, processing system failures and fulfillment of the diversified regulations. So that, individual operating problem is a small portion for a well-managed institution but causes an effect which may be quite costly (Santomero, 1997).
- **Reputational risk** arises from negative opinions which may affect the profit and value of institutions. It demonstrates a decreasing value of institution's brand or a lack of ability to persuade (Protiviti, 2013).
- **Legal risk** generally happens in financial contracting which is separated from the legal implication of credit, counterparty and operational risk. New status, tax legislation, court opinions and regulations can lead formerly well-established transactions into contention (Santomero, 1997). For example, environmental regulation has affected the value of real estate for elder properties which cause risk to lending institutions.

Another type of legal risk can come from the activities of bank's management or employees such as fraud and violation of regulations or laws (Santomero, 1997).

- **Credit risk** has commonly been identified as a greatest risk on bank's performance (Boffey & Robson, 2007). It is a risk that counterparties in loan transactions and derivatives transactions might default, which means

Counterparties fail to repay the principal and interest on a timely basis (Koch& MacDonald, 2000).

Al-Mazrooei & Al-Tamimi (2007) clearly state that the foundation of prudential banking is risk management and it is crucial to the survival of the organization; however they attach more importance to the liquidity, the interest rate, the foreign exchange and the credit risk. Many researchers seems to be in agreement that those four are the most important risks that a bank faces (Santomero, 1997; Boffey & Robson ,1995), thus most studies describe how these four risks are managed. This perspective however neglects counterparty risk which is quite related to the credit risk and could pose a significant threat depending on the trading volume in the question, as its magnitude directly determines the extent of the risk. This paper focuses on the credit risk of banks. Considering the credit risk, credit default becomes a key influential factor for bank's credit risk.

2.3. Risk Management

Risk management is mainly focused on reducing earning volatility and avoiding large losses. One proper Risk management procedure needs to identify the Risk, measure the Risk and quantify Risk then develop strategy to manage Risk (Van Gestel & Baesens, 2008).

ISO 31000: 2009 have presented the Risk management process to be as follows Reema (2017):

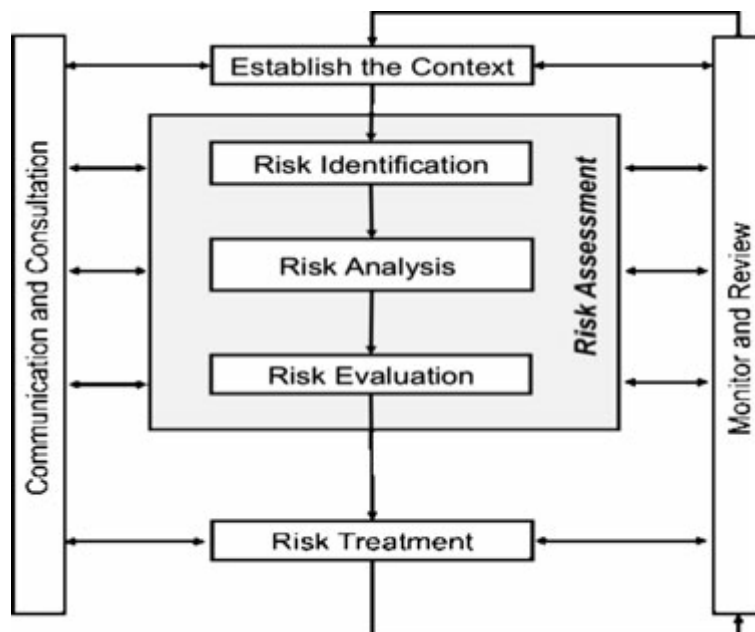


Figure 1: Risk Management Process from ISO 31000:2009

According to ISO 31000: 2009 risk management process has two elements which are communication and consultation with stakeholders and monitor and review of the internal and external environment. And the main Risk management process includes three steps that are Establishing the context, Risk assessment and Risk treatment (Purdy, 2010).

Establishing the context is defining what the organization aims to achieve; and outlining the internal and external factors which could influence the organization goals (Purdy, 2010).

Risk assessment includes Risk identification which is understanding what could happen, how, when and why. Then in Risk analysis step follows which involve the understanding of each risk and its consequences. The third step of Risk assessment is Risk evaluation which is making a decision about the level of risk.

Risk treatment could be achieved by improving existing controls or by developing and implementing new controls. Risk can be treated through four ways:

- Risk avoidance,
- Risk reduction,
- Risk acceptance and
- Risk transfer

(VanGestel & Baesens, 2008). **Risk avoidance** is a simple way of treatment which refers to individual investing in the products that are not too risky. Avoidance does not imply avoiding all risks. One strategy can be investing in counterparts with low exposure risk or investing only small proportion in counterparts with high default.

Risk reduction states reducing the portion of risk taken which means use collateral to reduce the actual loss.

Risk acceptance is commonly applied for low-risk assets (VanGestel & Baesens, 2008). It emphasizes the diversification of investments in various sectors and countries.

Risk transfer implies transfer risk to other institutions such as banks, insurances or companies.

2.4. Credit Risk

Credit Risk is the major risk which is one of the leading reasons for bank failure. Banks are intermediaries between depositors and creditors and the main source of their income is the interest spread; the difference between interest income and interest expense. With providing credit to customers, banks face risk of not collecting back the disbursed loan; i.e., credit risk.

Credit risk can be defined as the risk that the interest or principal or both will not be paid as promised. Credit risk is a financial exposure resulting from a Bank's dependence on another party (counterparty) to perform an obligation as agreed (National Bank of Ethiopia,2010).Credit risk, as defined by the Basel Committee on Banking Supervision (2001) is also the possibility of losing outstanding loan partially or totally, due to credit events (default risk). It can also be defined as the potential that a contractual party will fail to meet its obligations in accordance with the agreed terms. Credit risk is also variously referred to as default risk, performance risk or counterparty risk (Brown and Moles, 2012).

2.5. Sources of Credit risk

VanGestel & Baesens (2008) mention that there can be many reasons for credit default by borrower. Mostly, the obligor is in a financial stressed situation and may be facing a bankruptcy. He can also refuse to comply with its obligation of debt service in the case of a fraud or legal dispute. Whenever banks agree to lend money to a borrower, even those with good credit history, there is always the risk of losing the principle, accrued interest or both. Banks cannot possibly ensure that all loans given out are fully paid with accrued interests, and on time. They try to secure loans and manage risks but still cannot ensure that every coin loaned out is recovered accordingly. Banks that are able to effectively and efficiently manage and master the practice of giving out loans with minimal nonperforming rates tend to make the most

profit, and stand a better chance of survival in the long run (European Central Bank, 2016).

Credit risk can be caused by a variety of reasons of both internal and external sources. The main sources of credit risk associated with internal factors are deficiency in credit policy and administration of loan portfolio; deficiency in appraising borrower's financial position prior to lending; excessive dependence on collaterals and bank's failure in post-sanction follow-up, etc. Moreover, Duka (2015) indicated that the financial incentives provided to the employees of a bank are also another source of credit risk. Employees have a strong tendency to opportunism and moral hazards by lending to poorly performing firms and individuals with questionable credit records. The World Development Report (2012) in the condition of uncertainty and information asymmetry, it is hard to design an incentive system for bank employees who are in charge of credit and lending. On the other hand, Sanusi (2002) claims that banks overworked their personnel which is key cause of poor credit appraisal systems, financial crimes, and the accumulation of assets with poor quality which eventually increase credit risk.

On the other hand, the external sources of credit risk are the state of economy, decline in disposable income, unemployment, monetary conditions, inflation, swings in commodity price, foreign exchange rates and interest rates, etc. Moreover Kithinji (2010) indicated that volatile interest rate, inappropriate laws, government interference and inadequate supervision by the central bank as sources of credit risk.

2.6. Credit Risk Management

Credit is the main income generating activity of banks. The risk the borrower does not pay as per the contract impact the bank's business. On the other hand, a bank with high credit risk has high bankruptcy risk that puts the depositors in jeopardy (trouble). This is because credit risk is that can easily and most likely prompts bank failure (Achou, 2008). An increase in a bank credit risk gradually leads to liquidity and solvency problems. According to Badar & Javid (2013), non-performing loans (NPL) severely damage the liquidity and profitability of banks. Increasing trend in NPL requires banks to maintain higher amounts of provision which decreases in earnings. On the other hand side, if mismatch between the maturities of deposits and

loans arises liquidity issues for the banks which deteriorates the functioning of banks and spoils the bank's image.

Thus, the aim of credit risk management in banks is maintaining credit risk within acceptable limit and the impact of credit risk on the overall financial stability of the bank. According to Banerjee, Prashantan and Farooqui (2009), the objective of the credit management is to maximize the performing asset and the minimization of the nonperforming asset as well as ensuring optimal point of loan and advance and their efficient management.

The effective management of credit risk is a critical component of risk management and indispensable for the long-term success of any commercial bank. Though the practice varies from bank to bank depending on the nature, complexity of activities of loan some of the approaches highlighted in literatures are the following.

Banks put structures that facilitate credit risk management by formulating strategies and policies that describe the bank's general tolerance, overall exposure level; ensuring the individuals and management responsible for credit risk have the necessary skills and knowledge; and establishing Credit Risk Management Committee which is responsible for implementing policies and procedures approved by the board and establishing acceptable levels of exposure to credit risk. Lindergren (1987) also emphasizes on putting processes to manage credit risk. According to him, the key principles in credit risk management process are sequenced as follows:

- Establishment of a clear structure,
- Allocation of responsibility,
- Processes have to be prioritized and disciplined,
- Responsibilities should be clearly communicated and accountability assigned.

Chinwe (2015) indicated that banks adopt different methods to minimize credit risk. These are risk-based pricing, calculating the interest rates on loans based on the probability of default, or the risk on the loan; firms incorporate very strict covenants

in their deal contracts which require the debtor to meet certain conditions such as maintaining a required capital level, or prohibit him from carrying out certain actions.

They also buy credit insurance that covers any losses that may result from unpaid receivables; ask collaterals and engage in credit guarantee scheme (CGS):

Moreover, according to (VanGestel & Baesens ,2008) the most important method starts with appropriate selection of the counterparts and products and good risk assessment model and qualified credit officers are key requirements for selection strategy .The other approach is limiting bank's how much credit a counterpart with a given risk profile can take need to be limited. It avoids the situation that one loss or limited number of losses endangers the bank's solvency .Other approach is diversification strategy of risks across different borrowers in different sector and geography so as to minimize concentration risk (Hang Nga, 2017).

Most importantly, credit risk is managed by formulating credit procedure and policies taking into account the different approaches highlighted above and following up credit processing and granting is according to the procedure and policy. Moreover an effective credit risk management is verified by internal risk control and audit which monitor credit discipline, loan policies, approval policies, facility risk exposure and portfolio level risk (VanGestel & Baesens, 2008).

2.7. Measurement of credit risk

Banks use different ratios to measure credit risk. These are:

1. Non-performing loan ratio (NPLR). A loan is said to be non-performing, if the borrower default its payment schedule or it is in arrears. NPLR is the ratio of non-performing loans to total loans. This ratio shows the quality of bank loans. The lower the NPLR the higher the quality of the bank loans.
2. Capital adequacy ratio is defined as the ratio of capital to the risk-weighted sum of bank's assets (Hyun & Rhee, 2011). It shows the financial soundness of a bank, its capacity of covering the eventual losses due to some risk.
3. The ratio of Loan Loss Reserves to Gross Loans (LOSRES) is a measure of bank's asset quality that indicates how much of the total portfolio has been

provided for but not charged off. Indicator shows that the higher the ratio the poorer the quality and therefore the higher the risk of the loan portfolio will be.

4. Loan loss provisioning as a share of net interest income (LOSRENI) is another measure of credit quality, which indicates high credit quality by showing low figures.
5. The amount of provision is “accounting amount” which can be further subtracted from the profit. Thus high NPL increases the provision while reduces the profit.

2.8. Profitability of Banks

The term profitability refers to the ability of business organization to maintain its profit year after year. Measuring profitability is the most important measure of the success of the business.

Similar to any business, the sustainability of the bank’s depending on its profitability. Ongore & Kusa (2013) asserted that profit is the ultimate goal of commercial banks, thus all the strategies designed and activities performed are meant to realize this grand objective besides social and economic goals. Profitability of a bank according to Podder (2012) is the efficiency of a bank at generating earnings cited on (Lipunga, 2014). Profitability of the banks apart for ensuring sustainability of the banks, it will contribute to the economic development of the nation as a whole by providing additional employment and tax revenue. On the other hand, however, poor profitability in banks can lead to banking failure and crisis which have directly negative consequences on the economic growth (Ongore & Kusa, 2013).

Ratio analysis is used to measure and analyze the bank’s profitability. Financial statements of banks demonstrate some ratios and some can be calculated based on requirements if needed.

Koch & Mac Donald (2009) stated that relatively appropriate measures for measuring the bank’s profitability level are Return on Assets (ROA) and Return on Equity (ROE) .These measures are described in the light of the existing literature in this section.

ROA is calculated as a percentage of net income and total assets. ROA is used as main profitability measure in most of the organizations including banks and financial institutions. The ROA demonstrates the level of net income produced by the bank and also determines how the assets utilized by banks to generate profit over the year's. The competence and proficiency of banks in transforming their assets into profits is also indicated by it. Hence, to improve the performance of banks, they always attempt to achieve higher ROA. The ranking of banks is usually based upon the higher ROA ratio and total assets. As a general view, particularly in banking sector, ROA is known as good profitability multiplier for the reason that equity multiplier does not influence it.

A percentage of net income over shareholder's equity is termed as ROE. The net income comprised of all types of earnings like preferred stock income, surpluses, undivided profits and capital reserves. The difference between net assets and liabilities is termed as shareholder's equity on the other hand. The most common measure to determine the effectiveness of banks of generating revenue based on every element of shareholder's equity. To attain sufficient level of profitability, Both ROE and ROA refer to bank's managerial ability. According to Golin & Delhaise (2013), the ROE between 15 to 20 per cent is considered to be good for a banking institution. The significant difference between ROA and ROE measures is debt. The total assets and shareholder's equity will become equal in the absence of debt; consequently the results drawn from each measure would be equivalent. According to the Koch & MacDonald (2009) a greater value of ROE is not always considered as inspirational indicator of good performance of the bank, consequently ROA is known as suitable measure of profitability and efficiency of the banks.

2.9. Determinants of Profit

Most of studies on profitability of banks consider two categories namely endogenous (internal) and exogenous (external) drivers or factors that influence profitability. Internal factors of bank performance can be defined as factors that are influenced by a bank's management decisions. On the other hand, external determinants of bank profitability are factors that are beyond the control of a bank's management. The

external factors relate to both industrial and macro-economic conditions. One of the internal factors is credit risk management which is the interest of this study.

As the main source of revenue for banks is interest income increase in bank loans indicates an increase in interest income in turn increase in profitability. On the other hand, a high volume of loan alone do not guarantee for higher interest income. However, rather the quality of loan or the soundness of the loan portfolio greatly impact profitability. Credit quality is associated with credit risk management. The asset quality shows the ability of bank to manage credit risk. Changes in credit risk may reflect changes in the health of bank's loan portfolio which affects the performance of the bank. Miller & Noulas (1997) suggest that the more financial institutions being more exposed to high risk loans increases the accumulation of unpaid loans and decreases profitability cited on (Sufian & Chong, 2008). This is due to that banks are forced to held provision for loan loss which is deducted from the profit.

2.10. Empirical Review

Tekalagn (2015) did a research about credit risk management and its impact on performance of commercial banks of Ethiopia the paper try to investigate the relationship between credit risk management and its impact on performance of commercial banks in Ethiopia. The study based on secondary data which were collected from nine commercial banks in Ethiopia. The panel data of a six year period from 2009 to 2014 from the selected banks were used to examine the relationship between credit risk and performances. The data were analyzed using descriptive statistics and panel data regression model. Return on Assets (ROA) and Return on equity (ROE) were used as performance variables and Capital Adequacy Ratio(CAR), Non-Performing Loans to Total Loans (NPLR), Loan provision to Total Loan Ratio(LPTLR), Loan Provision to Non-Performing Loans Ratio (LPNPLR), Loan Provision to Total Assets Ratio(LPTAR) and Non-Performing Loans to Total Loans (NPLTLR) were used as variables of credit risk management. The regression results of the study suggested that CAR and NPLR of the banks are significantly negatively related with ROA and ROE and LPTLR, LPNPLR and LPTR significantly positively related with ROA and ROE.

Kenned (2016) assessed the effect of credit risk on financial performance of commercial banks in Kenya. The study covered the period between year 2005 and 2014. Credit risk was measured by capital to risk weighted assets, asset quality, loan loss provision, loan and advance ratios and financial performance by return on equity (ROE). The study used the balance sheets components and financial ratios for 43 commercial banks in Kenya registered by year 2014. From the results credit risk has a negative and significant relationship with bank profitability. Poor asset quality or high non-performing loans to total asset is related to poor bank performance both in short run and long run.

Engdawor (2014) examined the quantitative effect of credit risk on the performance of commercial banks in Ethiopia, considering variables related to lending activities, over the period of 5 years (2008-2012). The study used Return on Assets (ROA) as dependent variable, to represent Banks' performance. The study fundamentally

involves both descriptive and econometrics techniques. A non- probability method in the form of judgmental sampling technique is employed in selecting the eight Banks into the sample and the data are sourced from the Annual Reports of the same Banks which account for over eighty percent of the total loan and advance in the industry. The study finds that the selected variables: the provision to total loans, loan to total asset, credit administration (cost to total loans) and Size (Economies of scale) have significant effect on the performance of Banks.

Misker (2015) examined the impact of credit risk management on profitability of banks in Ethiopia. The study used a secondary data for eight banks which stayed in the industry for more than eleven years based on panel data analysis for the period 2003 to 2013. The data was analyzed by using random effect model and used for the purpose of analysis, EView 6 software. The study concluded that NPLR, Capital Adequacy, Loan to Deposit and Bank Size, had a statistically significant effect on the level of ROE. However, the results of this random effect regression model revealed the insignificant effect of Interest spread rate, GDP and inflation rate on the level of ROE of commercial banks in Ethiopia for the period under consideration. According to the regression results, the findings indicated that bank credit risk management measured in terms of NPLR has negative and statistically significant impact on ROE. This result is unusual since one would expect a riskier business will have the bigger return. This implies that banks can make a profit as far as they can minimize the credit risk. The study concluded that profitability in the Ethiopia banking sector is largely driven by managerial decision than external factors.

Girma (2011) investigated credit risk management and its impact performance on Ethiopian Commercial Banks. The researcher used 10 years panel data from the selected commercial banks for the study, to examine the relationship between ROA and loan provision, non-performing loans and total assets. The study shows that there is a significant relationship between bank performance and credit risk management. It shows the challenges faced by the financial institution with regard to credit risk management and it shows the major tools or techniques used by financial institution to manage their credit risk. The Banks supervisors are well aware of this problem, it is however very difficult to persuade Bank mangers to follow more prudent credit policies during an economic upturn, especially in a highly competitive

environment. They claim that even conservative managers might find market pressure for higher profits very difficult to overcome.

Zewude (2011) did a study on credit risk management and the profitability of commercial banks in Ethiopia. The purpose of the study was to measure the impact of credit risk management on profitability's of seven major commercial banks in Ethiopia. The researcher used regression model, to analyze the data which was collected from the National Bank of Ethiopia and from seven commercial banks of the country. The study used a multiple regression model with one dependent and two independent variables. The ROE was taken as the dependent variable while the independent variables were the NPL ratio and the CAR. A few questionnaires were also distributed to credit risk management bodies of each bank in the study. The study revealed that both non-performing loan ratio and capital adequacy ratio has a negative impact on profitability's of commercial banks in Ethiopia. The impact level of nonperforming loan ratio was negative which means that a single unit increase in nonperforming loan ratio led in 0.594077unit decrease of profitability of commercial banks of Ethiopia. A unit increase of capital adequacy ratio also led to 0.831816 unit decreases in profitability of commercial banks of Ethiopia.

Chemjor (2007) in her study on the Significance of the factors contributing to non-performing loans in Commercial Banks in Kenya used questionnaires that were administered to the 43 commercial banks in Kenya that year. The factors leading to non-performing loans were divided into 3 categories, bank related factors, economic factors and customer related factors. To rank the factors according to their significance, a Likert scale continuum was used then Factor Analysis was used to determine their significance. From the study, she established that insolvency or dissolving of the borrowing company had the most significant contribution to the non-performing loan problem. The second factor was death of the borrower. The study further revealed that the major factors the bank management need to pay attention to were poor monitoring and control of loans by bank management, breach of contract, lack of proper knowledge, artificial and natural disasters, bank takeovers by other banks, company dissolution due to loan default, loss of job by the

borrower, bankruptcy of the debtor and closing down of businesses with commercial bank loan due to competition. The study concluded that Commercial banks needed to have proper monitoring Systems and sound credit management systems in order to alleviate the problem.

Margaret (2014) did a research study on the effect of credit risk management on the financial performance of commercial banks in Kenya. This research study adopted a descriptive research design. Regression analysis model was used with the ROA as the dependent variable. Credit risk was the independent variable measured by variability in the ratio of loans to deposits. The research was done on all the commercial banks in Kenya over a five year period. Return on assets was determined as the ratio of Earnings before Interest and Tax to book values of assets. The regression results showed that the constant term was positive and significantly different from zero. The regression the constant term was 0.0179148 which was significantly different from zero indicating that apart of variation in ROA could not be explained by variation in credit risk across commercial banks. However, the coefficient of credit risk was a positive value of 0.00982604 indicating that higher credit risk led to better financial performance for commercial banks in Kenya as measured by an improvement in the ROA. The study recommends that commercial banks in Kenya should be encouraged to share information on their borrowers in order to improve the quality of the loan book. However banks should have better credit risk management practices so as to enhance their financial performance.

Shibiru and Mebratu (2014) Assess the impact of credit risk management on the performance of private commercial banks in Ethiopia. The study consisted of six private commercial banks for a 14years (2000 to 2013) were collected from audited financial statement of respective banks and National Bank of Ethiopia. The collected data were analyzed by using panel data regression model and the result showed that credit risk management measures: capital adequacy ratio, total loan ratio, non-performing ratio, bank size and liquidity ratio have a significant impact on the performance(ROA and ROE) of Private commercial banks. The study recommended that the banks' credit risk management should give due attention on capital adequacy

and management of loan portfolios in order to minimize the high incidence of non-performing loans and their negative effect on profitability of commercial banks.

2.11. Summary and Research Gap

From the above theoretical as well as empirical review, credit risk is affecting the performance of the banking industry a number of studies have been carried out with the objective of establishing the relationship between credit risk management and the financial performance of commercial banks in different parts of the world. From my review, similar studies have been done for commercial banks in Ethiopia and Kenya. The researchers try to identify the effect of credit risk management practices on the main two categories dependent and independent variables which are ROA , ROE, CAR, NPL, Loan Provision and Total Asset of commercial banks. Each of the studies focused with different variables to measure credit risk of commercial banks.

The major gap of Tekalagn (2015) paper is that it used only six years data (which is not enough for this kind of research) and also it did not clearly disclose (define) which commercial banks are selected and sectors of the banks (private /public).

Kenned (2016) did not include the major dependent variable which is ROA (Return on Asset) which shows and measures the efficiency and profitability of the bank. The gap of Engdawork (2014) paper in the researcher view is that it only used five year data and did not use the major dependent ROE variable. The gap of Misker (2015) paper is it did not mention the name of the selected banks. The paper only declared the qualification (criteria) of selection.

In my view Girma (2011) research gap recognized difficulty of market pressure to follow more prudent credit policies. The gap the researcher observed on Zewde (2011) that tried to measure credit risk management and profitability of commercial banks in Ethiopia is he used only one dependent and one Independent variables. The study by Chemjor (2007) did not include the effect of the credit risk management

practice on the profitability of commercial banks of Kenya; she only assessed the significance factor which leads to Non-performing Loan (NPL) problem.

Margaret (2014) on her research on the effect of credit risk management on the financial performance of commercial banks in Kenya try to determine relationship between credit risk management and financial performance of commercial bank but consider only a five years data and also only two variables were used for regression analysis model one dependent (ROA) and one independent Credit Risk variables.

Shibiru and Mebratu (2014) assessed the impact of credit risk management on the performance of private commercial banks in Ethiopia. The major gap of this paper is they assess only private banks but more than half of the bank industry financial asset and loan is held by government banks particularly Commercial Bank of Ethiopia.

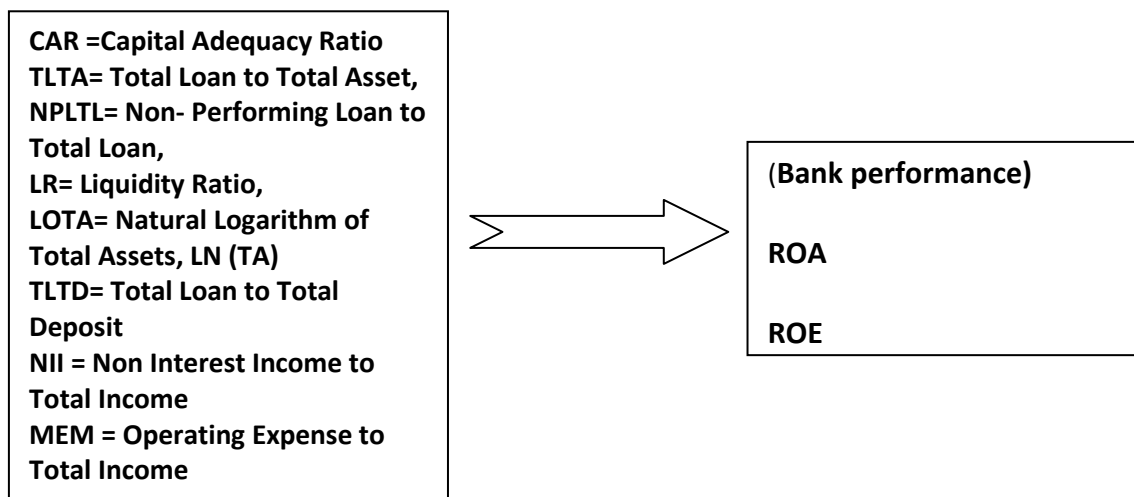
This study tried to address this research gaps by assessing the effect of credit risk management on profitability of Commercial Bank of Ethiopia which is the biggest bank holding more than half of the banking industry asset. Moreover, additional explanatory variables are included to the regression which will have impact on profitability.

2.12. Conceptual Framework

Commercial banks are exposed to credit risk. Non-performing loans (NPL) affects the profitability of banks. The indicators to measure the credit risk management: capital adequacy ratio (CAR) and non-performing loans ratio (NPLR), which are the main indicators used to assess the soundness of the banking system. Performance of banks is mostly measured by Return on Asset (ROA) and Return on equity (ROE).

Thus, in order to test the effect of these variables on the performance of Commercial Bank of Ethiopia, this study develops the following conceptual framework. The study's conceptual framework is developed according to the work of Kenneth and Charles (2013).

Figure 2: Conceptual Framework of the study adopted from Kenneth and Charles (2013).



CHAPTER THREE

3. Methodology

3.1 Research Approach

This chapter has set out the various stages and phases that the researcher has followed in order to complete this study. The procedures and techniques the researcher used quantitative approach for the collection, processing and analysis of data are highlighted accordingly below.

3.2 Research Design

This research has studied the problem through the use of explanatory research design. Explanatory research deals with cause-effect relationship. In explanatory research design, emphasis on specific objectives about the effects of changes of one variable on another variable and it involves an experiment where an independent variable is changed or manipulated to see how it affects a dependent variable (Mugenda, 2003). Explanatory research design was useful in this study since it enabled the researcher to examine the effect on the dependent variable from variations in the independent variables.

3.3 Sample selection

The target population for this study was Commercial Bank of Ethiopia. However, sixteen private and one another government (DBE) banks operating in the country are available were not included. Commercial Bank of Ethiopia is government owned bank and its credit approval process is more focused on supporting the government development goals by providing credit to the sectors deemed priority by the government. And it is the provider of credit to government projects. On the other hand, private banks, although they operate according to the regulation of the National Bank of Ethiopia, they are more inclined to profit motivated credit approval. Thus, the credit risk management in the Commercial Bank of Ethiopia and other private commercial banks is expected to be different.

3.4 Research Methodology

This section deals with the methods of data collection and the methodology employed in the research analysis. Secondary data was used for the purpose of empirical analysis; this includes the data collected from Commercial Bank of Ethiopia, MIS department, National Bank of Ethiopia Annual Reports. The study has used time series data regression analysis to investigate the effect of credit risk management on the profitability performance of Commercial Bank of Ethiopia in the period 2000 to 2018.

3.5. Model Specification

This study is modeled according to the work of Kenneth and Charles (2013), which investigated the impact of credit risk management and capital adequacy on the financial performance of Nigerian banks. Kanneth & Charles (2013) used ROA as a dependent variable in their model, but researcher used ROA and ROE, the two most common indicators of performance in two different models. Moreover, we modified the model and add some additional variables.

The study used time series data over the period 2000-2018 on the identified dependent and independent variables. ROA and ROE, the two most common indicators of performance are used as dependent variables in two different models. Moreover, the bank size, Non-interest Income and Management efficiency included as exploratory variable. Thus, the dependent variables in this study are performance measured by rate of Return on Asset (ROA) and Return on Equity (ROE). The independent variables measured by the capital adequacy ratio(CAR), Non-Performance loan ratio (NPLR), Liquidity ratio(LR), Bank size(natural logarithm of total assets) total loan to total deposit (TLTD), total loan to total asset (TLTA), non-interest income (NII) and management efficiency or Overhead Expense (MEM.)

A linear regression model used to determine the relative importance of each explanatory in affecting the profitability of bank is determined using the linear equation. The linear regression model is:

$$\text{EQ1 } Y_t = \beta_0 + \beta_i X_{it} + \varepsilon_t$$

Where Y_t - is the dependent variable observed at time t;

X_{it} - is the i th independent variable observed at time t

β_0 - is the constant term

β_i - is the coefficient for explanatory variables

ε_t - is the error term.

The Models are expressed as follows:

$$\text{EQ2 } \text{ROA}_t = \beta_0 + \beta_1(\text{CAR}_{it}) + \beta_2(\text{LR}_{it}) + \beta_3(\text{NPLTL}_{it}) + \beta_4(\text{TLTA}_{it}) + \beta_5(\text{LOTA}_{it}) + \beta_6(\text{TLTD}_{it}) + \beta_7(\text{NII}_{it}) + \beta_8(\text{MEM}_{it}) + \varepsilon_{it}$$

$$\text{EQ3 } \text{ROE}_t = \beta_0 + \beta_1(\text{CAR}_{it}) + \beta_2(\text{LR}_{it}) + \beta_3(\text{NPLTL}_{it}) + \beta_4(\text{TLTA}_{it}) + \beta_5(\text{LOTA}_{it}) + \beta_6(\text{TLTD}_{it}) + \beta_7(\text{NII}_{it}) + \beta_8(\text{MEM}_{it}) + \varepsilon_{it}$$

Where,

ROA= Return on asset,

ROE= Return on equity,

CAR= Capital adequacy ratio,

TLTA= Total loan to total asset,

NPLTL= Non- performing loan to total loan,

LR= Liquidity ratio,

LOTA= Natural logarithm of total assets,

TLTD= Total loan to total deposit,

MEM = Operating Expense to Total Income

NII = Non Interest Income to Total Income

β_0 = Intercept,

β_1 to β_6 are Coefficients of explanatory variables

3.6. Variable description

A. Return on Asset

Return on asset is one of the major ratios that indicate the profitability of a bank. It measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how efficiently the resources of the company are used to generate the income. It further indicates the efficiency of the management of a company in generating net income from all the resources of the institution. Wen (2010) stated that, a higher ROA shows that the company is more efficient in using its resources (cited on Ongore & Kusa, 2013). The problem of ROA is that it excludes off-balance sheet items of the bank creating a positive bias in evaluating bank performance (Davydenko, 2011, cited on Lipunga, 2014).

B. Return of Equity

Another measurement of profitability is return on Equity (ROE) which measures how much profit a company earned compared to the total amount of shareholder equity invested or found on the balance sheet. ROE is what the shareholders look in return for their investment. A business that has a high return on equity is more likely to be one that is capable of generating cash internally. Thus, the higher the ROE the better the company is in terms of profit generation (Ongore & Kusa, 2013). The problem of this ratio is, however, is that it disregards financial leverage and the risks associated with it (Flamini et. al, 2009).

C. Capital Adequacy Ratio

Capital requirement (also known as capital adequacy) is the amount of capital a bank or other financial institution has to hold as required by its financial regulator. Capital adequacy is estimated by the ratio of total equity to total assets. This indicator reflects the financial soundness of a bank, its capacity of covering the eventual losses that can arise when a risk appears (Roman & Dănuleşiu, 2013). However, its impact on profitability is ambiguous.

D. Total Loan to Total Assets

The ratio of loans to total assets indicates which percentage of banking assets are represented by loans. When the ratio increases, happen it loans triggers an increase in interest income and this result increase in profitability. On the other hand, a high volume of loan alone does not guarantee for higher interest income. Despite that, it is argued that an increase in the level of this indicator can state a deterioration of the soundness of loan portfolio, with a negative impact on profitability. Thus, the quality of loans would also affect profitability.

E. Non-Performing Loans to Total Loans Ratio (NPLTL)

Non-performing loans to total loans ratio (NPLTL), reflects the bank's credit quality and is considered as an indicator of credit risk management. NPLTL, in particular, indicates how banks manage their credit risk because it defines the proportion of loan losses amount in relation to total loan amount (Hosna *et al*, 2009). NPLR indicates the accumulation of unpaid loans and decreases profitability. It is expected that NPLR has negative effect on profitability.

F. Liquidity Ratio

Liquidity reflects the capacity of a bank to pay the debts on a short term and to cope with unexpected withdrawals of depositors. In order to honor these obligations and in general to be able to provide liquidities, the bank must own highly liquid and easily transferable assets. The fewer amounts of funds tied up in liquid asset the higher we might expect profitability to be achieved. (Eichengreen & Gibson,2001). Liquidity is measured by the ratio of liquid assets to total assets which indicate the percentage of bank assets that are not tied up in loans.

G. Bank Size

Bank size is estimated by the natural logarithm of the total assets of a bank. Bank size is generally used to capture potential economies or diseconomies of scale in the banking sector. This variable controls for cost difference and product and risk

diversification according to the size of the institution. The first factor could lead to a positive relationship between size and bank profitability if there are significant economies of scale (Akhavain, Berger & Humphrey, 1997)The second may lead to a negative one if increased diversification leads to lower credit risk and thus lower returns (Sufian and Chong, 2008).

H. Deposits:

Deposits are the main source of banks funding and are the lowest cost of funds. The more deposits are transformed into loans, the higher the interest margin and profit. Therefore, deposits have positive impact on profitability of the banks (Alper & Anbar, 2011). It is, however, argued that financial growth from deposits is profitable only if the bank does not incur additional expenses to obtain and retain cash.

I. Non Interest Income (NII)

Income diversification of the bank measured by non - interest income over total gross revenues. The majority of banks' income generated from interest income. However, non-interest income can protect profit from decline when there is interest fluctuations and loan default risk. An increase of this indicator, as a result of bank activities, leads to an increase of bank's profitability (Roman & Dănuleşiu, 2013).NIR- Income diversification of bank (ratio of non-interest income to total income).

J. Overhead expense or Efficiency Management (MEM)

Overhead expense shows how banks are able to manage their cost in order to boost their profits (Ayanda et.al, 2013). For the most part, it is argued that reduced expense improve the efficiency and hence raise the profitability of a financial institution, implying a negative relationship between the operating expense ratio and profitability. However, Molyneux & Thornton (1992) have observed a positive relationship, suggesting that high profits earned by firms may be appropriated in the form of higher payroll expenditures paid to more productive human capital (Sufian and Chong, 2008). Efficiency Management is expressed by the ratio of operating expense to gross income.

The selected study variables, their definition, basis of measurement and priori expected sign has been depicted in Table 1.

Table 1: Variables definition, measurement and expected sign

No.	Abbreviation	Variables	Description of Measurement	Expected Sign
1	CAR	Capital adequacy ratio	Total Capital / Risk Weighted Asset	+
2	TLTA	Total loan to total asset	Total Loan / Total Asset	?
3	NII	Non- Interest Income	Non-Interest Income to Total Income	+
4	MEM	Management Efficiency or Overhead Expense	Operating Expense to Total Income	?
5	NPLTL	Non- performing loan to total loan	NPL / Total Loan	-
6	LR	liquidity ratio	Liquid Asset / Total Deposit	+
7	LOTA	Bank Size	Natural logarithm of total assets LN(Tot Asset)	?
8	TLTD	Total loan to total deposit	Total Loan / Total Deposit	?

CHAPTER FOUR

4. DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter discusses the findings of the research. The objective of this research is to find out relationship between credit risk management and profitability performance of Commercial Bank of Ethiopia see in Annex I.

Descriptive analysis is brief descriptive summarization of a given data set, which can be either a representation of the entire or a sample of a population. In the descriptive, the general trend of the data and the breaks in the trend are analyzed. The paper analyzes the model and presented in Annex II.

Multivariate Analysis examines several variables to see if one or more of them are predictive of a certain outcome. The predictive variables are independent variables and the outcome is the dependent variable.

A. Normality test

Before using the model and regression of the effects of credit risk on the performance of bank profitability determinants, it is necessary to check whether the individual explanatory series follow normal distribution. Some researchers believe that linear regression requires that the outcome (dependent) and predictor variables to be normally distributed. In actuality, it is the residual that need to be normally distributed. In fact, the residual need to be normal only for the t-tests to be valid. A common cause of non-normally distributed residual is non-normally distributed outcome and/or predictor variables.

In order to test, whether the individual series follow a normal distribution Jarque-Bera test is conducted using EViews 7. The result indicated that all explanatory and dependent variables follow normal distribution except for the MEM (Overhead

expense ratio). Accordingly natural log transformation is made on this MEM variable.

B. Multicollinearity Test

Multicollinearity means that some of the explanatory variables are not independent but are correlated. When independent variables are highly correlated in the model, the results from t-test and *F* test may contradict each other and the parameter estimates may have opposite signs from what are expected; affected coefficients may fail to attain statistical significance due to low t-statistics and sign reversal might exist. It becomes difficult to assign the change in the dependent variable precisely to one or the other of the explanatory variables. It is, therefore, advisable that when the model has several explanatory variables the regression analysis should commence with first calculating the coefficient of correlation between each pair of independent variables to be included in the model. If one or more correlation coefficients are close to 1 or -1, the variables are highly correlated and a severe multicollinearity problem may exist and it is necessary to remove one of the correlated independent variable.

As shown in correlation matrix, table the correlation between LOTA (Loan to asset ratio) with (LR (Liquidity) and NPLTL (NPL ratio) and TLTA (total loan to total asset) and TLTD (loan to deposit ratio) have high correlation.

Table 1 : Pair-wise Correlation of Explanatory Variables

	CAR	LOTA	LR	ME	NII	NPLTL	TLTA	TLTD
CAR	1.000000	0.369175	-0.15551	0.258488	-0.416852	-0.237962	-0.295059	-0.270118
LOTA	0.369175	1.000000	-0.846222	-0.275533	-0.646761	-0.775342	-0.175544	-0.128188
LR	-0.15551	-0.846222	1.000000	0.181402	0.655093	0.741672	-0.188758	-0.218597
ME	0.258488	-0.275533	0.181402	1.000000	-0.237635	0.488650	0.448572	0.298086
NII	-0.416852	-0.646761	0.655093	-0.237635	1.000000	0.379019	-0.408962	-0.43504
NPLTL	-0.237962	-0.775342	0.741672	0.488650	0.379019	1.000000	0.234202	0.069716
TLTA	-0.295059	-0.175544	-0.188758	0.448572	-0.408962	0.234202	1.000000	0.959338
TLTD	-0.270118	-0.128188	-0.218597	0.298086	-0.43504	0.069716	0.959338	1.000000

Another approach to check for multicollinearity is checking the Variance Inflation factor (VIF) after performing regression analysis. VIF is a measure of how much the variance of an estimated regression coefficient increases if the explanatory variables are correlated. The VIF of an independent variable is the value of 1 divided by 1 minus R^2 in a regression of itself on the other variables. The higher the value of VIF the greater is the degree of collinearity. Some authors suggest that if the VIF is >10 there is strong evidence that collinearity is affecting the regression coefficients and consequently they are poorly estimated. In this case it is suggested that a possibility that the model could be simplified, perhaps by deleting variables or perhaps by redefining them in a way that better separates their contribution.

After performing regression analysis VIF for of the explanatory variables were estimated using Eviews 7. All the coefficients are not significant and the F-statistics are significant which the indicator of multicollinearity for both ROA and ROE. The result as shown, the centered VIF for LOTA, LR, TLTD, NPLTL and TLTA are above 10 in both ROA and ROE equation. The remedial action taken in this study is dropping the LOTA and TLTD because as our analysis is only with CBE bank size effect is not that much necessary to compare and liquidity of the bank that could be captured by TLTD could be captured by LR.

Table 2: Amended Pair-wise Correlation of Explanatory Variables

	CAR	LR	ME	NII	NPLTL	TLTA
CAR	1.000000	-0.15551	0.258488	-0.416852	-0.237962	-0.295059
LR	-0.15551	1.000000	0.181402	0.655093	0.741672	-0.188758
ME	0.258488	0.181402	1.000000	-0.237635	0.488650	0.448572
NII	-0.416852	0.655093	-0.237635	1.000000	0.379019	-0.408962
NPLTL	-0.237962	0.741672	0.488650	0.379019	1.000000	0.234202
TLTA	-0.295059	-0.188758	0.448572	-0.408962	0.234202	1.000000

C .Multiple Linear Regression Assumption and Diagnostic Test

After regressing the dependent variable on the dependent variable and before going further and using the result it is necessary to check how well the assumptions of multiple linear regressions are satisfied. In this section the result of the tests has been discussed.

i- Hetroscedastic Test

One of the assumptions of multiple linear regressions is that the variance of the error terms is constant over time. When this does not hold, the errors are said to be hetroscedastic. Violations of homoscedasticity (which are called "heteroscedasticity") may have the effect of giving too much weight to a small subset of the data (namely the subset where the error variance was largest) when estimating coefficients. If this assumption is violated the standard errors will be biased. In that case the t-statistics and the t-test become invalid.

Breusch-Pagan-Godfrey test is conducted on the data for both ROA and ROE models indicating the variance of the error terms are constants.

ROA - Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.690122	Prob. F(6,12)	0.0259
Obs*R-squared	12.32176	Prob. Chi-Square(6)	0.0552
Scaled explained SS	3.603070	Prob. Chi-Square(6)	0.7302

ROE - Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.139217	Prob. F(6,12)	0.3974
Obs*R-squared	6.895070	Prob. Chi-Square(6)	0.3307
Scaled explained SS	1.437018	Prob. Chi-Square(6)	0.9636

ii- Serial Correlation Test

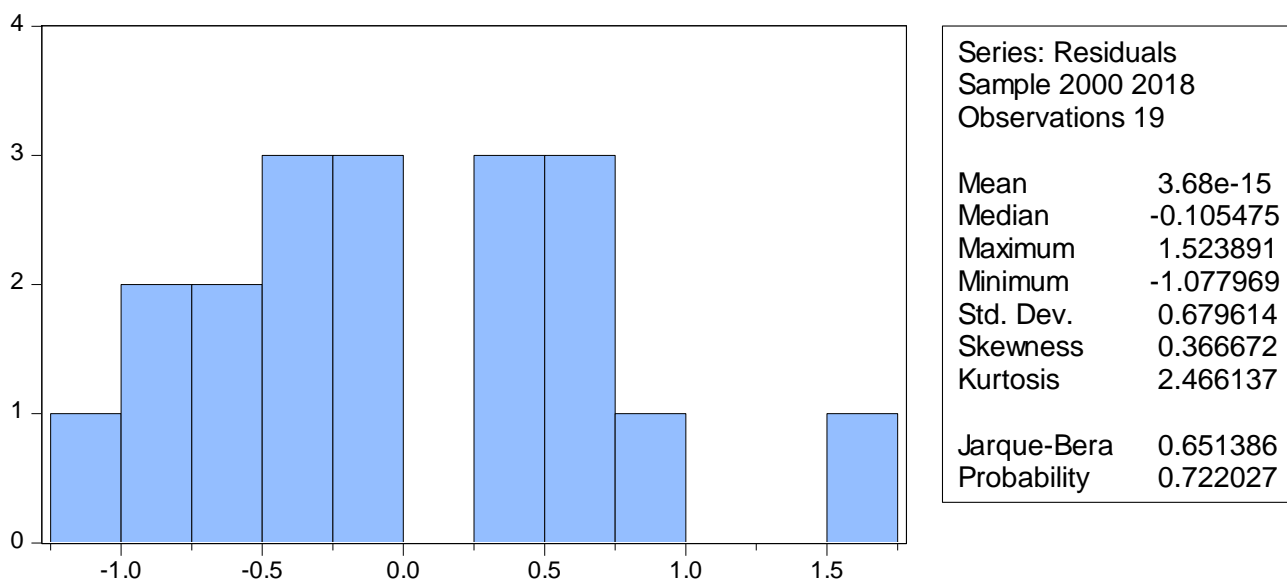
The other assumption of multiple linear regressions is that the errors in two different time periods are uncorrelated. When this does not hold, the errors suffer from serial correlation or autocorrelation. Serial correlation in the errors means that there is room for improvement in the model, and extreme serial correlation is often a symptom of a badly mis-specified model. Serial correlation is sometimes a byproduct of a violation of the linearity assumption. The coefficient estimates derived are still unbiased, but they are inefficient, meaning that the standard errors are biased. Furthermore, the R is likely to be inflated.

iii- The Normality Test

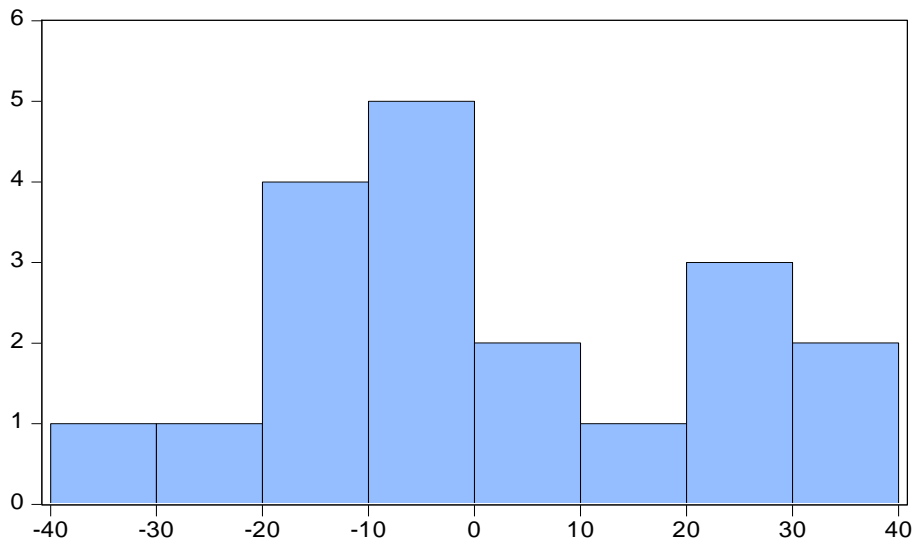
Another third important assumption of multiple linear regression is the normality assumption (i.e the normally distributed errors). Calculation of confidence intervals and various significance tests for coefficients are all based on the assumptions of normally distributed errors. If the error distribution is significantly non-normal, confidence intervals may be too wide or too narrow.

To detect whether the error terms are normally distributed or not Jarque -Bera test is used. The EViews 7 result indicated that the errors follow normal distribution.

ROA



ROE



Series: Residuals
Sample 2000 2018
Observations 19

Mean 9.55e-14
Median -3.741119
Maximum 34.78614
Minimum -30.77498
Std. Dev. 19.24477
Skewness 0.327756
Kurtosis 2.044956

Jarque-Bera 1.062262
Probability 0.587940

IV. The Stability Test

In multiple linear regression, it is assumed that the appropriate functional form is linear i.e., the regression model is assumed to be linear in parameters. Whether the model should be linear in form can be formally tested using Ramsey's reset test, which is a general test for misspecification of functional form.

Dependent Variable: ROA
Method: Least Squares
Date: 04/11/19 Time: 12:30
Sample: 2000 2018

Included observations: 19

ROA=C(1)+C(2)*CAR + C(3)*LR + C(4)*NPLTL + C(5)*TLTA +C(6)*MEM +
C(7)*NII

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	13.63781	3.094418	4.407228	0.0009
C(2) CAR	-0.039797	0.051664	-0.770294	0.4560
C(3)LR	0.001097	0.016825	0.065199	0.9491
C(4)NPLTL	-0.051874	0.022198	-2.336860	0.0376
C(5)TLTA	-0.032445	0.048563	-0.668101	0.5167
C(6)MEM	-2.735419	0.851548	-3.212289	0.0075
C(7)NII	0.007721	0.026925	0.286750	0.7792
R-squared	0.873411	Mean dependent var		2.899474
Adjusted R-squared	0.810117	S.D. dependent var		1.910138
S.E. of regression	0.832354	Akaike info criterion		2.748192
Sum squared resid	8.313757	Schwarz criterion		3.096143
Log likelihood	-19.10782	Hannan-Quinn criter.		2.807079
F-statistic	13.79919	Durbin-Watson stat		2.620978
Prob(F-statistic)	0.000092			

Dependent Variable: ROE
 Method: Least Squares
 Date: 04/11/19 Time: 12:36
 Sample: 2000 2018
 Included observations: 19

$$\text{ROE} = \text{C}(1) + \text{C}(2) * \text{CAR} + \text{C}(3) * \text{LR} + \text{C}(4) * \text{NPLTL} + \text{C}(5) * \text{TLTA} + \text{C}(6) * \text{MEM} + \text{C}(7) * \text{NII}$$

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	255.0043	87.62523	2.910170	0.0131
C(2) CAR	-2.476455	1.462992	-1.692733	0.1163
C(3)LR	0.590563	0.476427	1.239569	0.2388
C(4)NPLTL	-1.157228	0.628595	-1.840975	0.0905
C(5)TLTA	-0.217133	1.375168	-0.157896	0.8772
C(6)MEM	-46.58354	24.11346	-1.931848	0.0773
C(7)NII	-0.475840	0.762454	-0.624091	0.5443
R-squared	0.722966	Mean dependent var		51.47000
Adjusted R-squared	0.584449	S.D. dependent var		36.56337
S.E. of regression	23.56993	Akaike info criterion		9.435130
Sum squared resid	6666.499	Schwarz criterion		9.783081
Log likelihood	-82.63374	Hannan-Quinn criter.		9.494017
F-statistic	5.219334	Durbin-Watson stat		1.859885
Prob(F-statistic)	0.007375			

4.2. Regression Result and Discussion

The above tests indicate that both models of ROA and ROE satisfy the multiple linear regression assumptions and are good to use in estimating the relative importance of the factors in determining the profitability of the Bank.

The explanatory power of the models, R^2 for ROA and ROE models are 87 percent and 72 percent, respectively, which is high. The F-statistic is also significant for both models.

Capital adequacy Ratio (CAR) – The result of regression showed that Capital adequacy (CAR) has negative but insignificant relationship on both ROA and ROE models. Thus, the result was not in accordance with the expected sign of the study. Tesfaye (2014) also found insignificant effect though it was positive.

Liquidity Ratio (LR) – Credit risk management in terms of liquidity ratio has positive but insignificant effect on the performance of commercial bank of Ethiopia. Tesfaye (2014) also find insignificant but positive result.

Non-Performing Loan Ratio (NPLTL) - The result indicates that credit risk proxied by ratio of NPL ratio to total loan has negative and significant at 5% level of confidence for ROA model and negative and significant at 10% for ROE model. That is by one unit increase NPLTL decreases ROA and ROE by 2.336860 and 1.840975 units respectively. This result largely supported by Shibiru & Mebiratu (2017), Mekasha (2011), they observed that the negative effect of NPLs on the performance of banks is the symptom of ineffective credit risk management.

Total Loan Total Asset (TLTA) - The regression result indicates that total loan to total asset ratio has negative but insignificant relationship on banks performance.

Overhead expense or Management Efficiency (MEM) – this variable has a negative and significant effect on both ROA and ROE models at 1% and 10%, respectively. This implies that by one unit Management Efficiency increase, keeping the other thing constant, and then ROA & ROE decreases by 3.212289 & 1.931848 respectively. This is consistent with prior empirical evidence e.g. Ongore and Kusa (2013) on Kenyan Banks, Francis (2013) on Sub-Saharan Africa Banks, Athanasoglou

et al.(2006) on South Eastern European Banks, Birhanu (2013) on Ethiopian Banks and Tesfay (2014) on Ethiopian Banks). The result suggests that operating expenses appear to be an important determinant of profitability in the CBE case.

Non-interest income- this variable is used to test whether the non-interest income or diversification of income source contribute to the profitability. The result shows insignificant relationship in both models (ROA & ROE). Both Birhanu (2012) and Tesfaye (2014) found positive effect for Ethiopian banks and their result is, however, significant.

CHAPTER FIVE

5. Conclusion and Recommendation

5.1 Conclusion

Profitability is the primary goal of all businesses and is vital for the existence, survival and growth of any business. The profitability of banks is crucial for the economy since banks are stable when they are profitable and in turn maintains the stability of the whole economy. Because of this it is necessary for bank managers and policy makers to identify the underlying factors that influence the bank's profitability.

Studies on the effect of credit risk on the profitability performance of banks consider two categories namely endogenous (internal) and exogenous (external) drivers or factors that influence profitability. Internal factors of bank performance can be defined as factors that are influenced by a bank's management decisions which are the interest of this research paper. On the other hand, external determinants of bank profitability are factors that are beyond the control of a bank's management.

The objective of this study is to assess the effect of credit risk on the profitability performance of Commercial Bank of Ethiopia proxied by ROA and ROE. Therefore the study used time series data from 2000 to 2018 to estimate models on ROA and ROE using EViews 7.0.

According to the above finding results, the researcher concludes:

Non-Performing Loans (NPL)

- Based on findings Non-Performing Loans (NPL) and Profitability of banks which is measured by ROA and ROE have negative and significant relationship.

Management Efficiency (Overhead Expense)

- According to findings Management Efficiency (Overhead Expense) and profitability of Commercial Bank of Ethiopia has a negative and significant effect which means the increasing of Management Efficiency decreasing profitability of banks.

Others Independent Variables

- The others Independent variables which are Non-Interest Income (NII), Total Loan to Total Asset (TLTA), Liquidity Ratio (LR), Capital Adequacy Ratio (CAR), do not have significant effect on both dependent variables (ROA and ROE).

5.2 Recommendation

Based on Regression results, Non- Performing Loan and Management Efficiency have negative and significant effect on the credit risk management and profitability performance of Commercial Bank of Ethiopia (CBE). Therefore it is recommended:

To minimize Non Performing Loan (NPL)

- The bank has to revise and the fill gap of Credit Policy & Procedures within a short period of time (yearly).
- The bank has to establish strong follow up mechanism to insure strict adherence to the Policy and Procedure.
- The Bank Credit Department Staff need to get continuous training (at least in a quarter) to improve their Knowledge, Skill & Attitude.
- The banks have to establish sound and competent credit risk management department.

To control Management Efficiency (Overhead Expense)

- Taking decreasing controllable expense as one target by management;
- Designing ways to further control and decrease expenses;
- To involve all staff members to decrease controllable expenses which are: Telephone, Stationery, Per diem, Petroleum, Transport, Over time Clerical & non-Clerical;
- Applying efficient and tight management to decrease wastage of resources.

In general the researcher recommended that a further study should be done on the Effects of Credit Risk Management on the Profitability Performance of Commercial Bank of Ethiopia by focusing on Exogenous (External) factors.

REFERENCE

1. Achou & Tenguh (2008) Bank performance and credit risk management, school of Technology and society, University of Skoved.
2. Alper and Anbar (2011) Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey. Business and Economics Research Journal Vol 2 . No 2 .
3. Aremu, Suberu & Oke (2010) Effective credit processing and administration as a panacea for nonperforming assets in the Nigerian Banking System, J Economics Journal.
4. Athanasoglou (2006) Determinants of Bank Profitability in the South Eastern European Region. MPRA Paper No. 10274.
5. Ayanda (2013) Determinants of Banks' Profitability in a Developing Economy: Evidence from Nigerian Banking Industry. Interdisciplinary Journal of Contemporary Research in Business Vol 4, No 9.
6. Bhattarai (2016) Effect of Credit Risk on the Performance of Nepalese Commercial Banks , Prestige e-Journal of Management and Research, Volume 3, Issue 1 (April 2016) ISSN 2350-1316
7. Birhanu (2012) Determinants of Commercial Banks Profitability: An Empirical Evidence from the Commercial Banks of Ethiopia. Unpublished Master's Thesis <http://etd.aau.edu.et/dspace/handle/123456789/4614>.
8. Charles & Kenneth (2013) Impact of credit risk management and capital adequacy of financial performance of commercial banks in Nigeria, journal emerging issues in economics, finance and banking, ISSN: 2306-367X, volume 2, No.3
9. Chemjor (2007) Significance of the factors contributing to non-performing loans in Commercial Banks in Kenya. MBA Thesis.
10. Chinwe (2015) Credit Risk Management in Commercial Banks, IOSR Journal of Economics and Finance (IOSR-JEF) e-ISSN: 2321-5933, p-ISSN: 2321-5925. Volume 6

11. PhanThi (2017) The recommendations enhancing the effectiveness of credit risk management for Commercial Banks in Ho Chi Minh City, *British Journal of Marketing Studies* Vol.5, No.3, pp.51-63, April 2017
12. Ezirim (2005) Co-integration and error correction: Representation, estimation and testing. *Econometrica*.
13. LiYijunZouUmeå (2014) A Study of Europe School of Business and Economics, 2014. The Impact of Credit Risk Management on Profitability of Commercial Banks
14. Francis (2013) Determinants of Commercial Bank Profitability in Sub-Saharan Africa. *International Journal of Economics and Finance*.
15. Girma (2011) Credit Risk Management and Its Impact on Performance on Ethiopian commercial Banks, Addis Ababa University School of graduate studies.
16. Hamza (2017) Impact of Credit Risk Management on Banks Performance: A Case Study in Pakistan Banks, *European Journal of Business and Management* ISSN 2222-1905 (paper) ISSN 2222-2839 (Online) Vol.9, No 1. 2017.
17. Imad (2017) The Impact of Credit Risk on the profitability of Banks Listed on the Palestine Exchange, *Research Journal of Finance and Accounting* ISSN 222-1697 (Paper) ISSN 2222-2847 (Online) Vol. 8, No 8, 2017
18. Ken & Peter (2016) Credit Risk Management, Edinburgh Business School, Heriot – Watt University, 2016.
19. Kutum (2017) The Impact of Credit Risk on the profitability of Banks Listed on the Palestine Exchange, *Research Journal of Finance and Accounting* ISSN 222-1697 (Paper) ISSN 2222-2847 (Online) Vol. 8, No 8, 2017.
20. Lalon (2015) Credit Risk Management (CRM) Practices in Commercial Banks of Bangladesh: “A Study on Basic Bank Ltd.” *International Journal of Economics, Finance and Management Sciences* 2015.
21. Lipunga (2014) Determinants of Profitability of Listed Commercial Banks in Developing Countries: Evidence from Malawi. *Research Journal of Finance and Accounting* Vol.5, No.6.
22. Margaret (2014) The Effect of Credit Risk Management on the Financial Performance of Commercial Banks in Kenya, MBA Thesis.

23. Ndoka, and Islami, (2016) The Impact of Credit Risk Management in the Profitability of Albanian Commercial Banks During the Period 2005-2015, *European Journal of Sustainable Development* (2016).
24. Olokoyo (2011) Determinants of commercial banks' lending behavior in Nigeria. *International Journal of Financial Research*; Vol. 2.
25. Ongore and Kusa (2013) Determinants of Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Financial Issues* Vol. 3, No. 1, 2013.
26. Oretha (2012) the relationship between credit risk management practices and financial performance of commercial banks in Liberia. MBA Thesis.
27. Osayameh (1991) Lending and credit administration model for commercial banks. *Nigerian Financial Review*, 4(2):55-60. Osayameh, R. 1996. *Practice of banking: Lending and finance*, Vol. 2, Lagos: F.A. Publishers.
28. Pyle (1997) *Bank Risk Management: Theory*, Conference on Risk Management and Regulation in Banking Jerusalem, May 17-19, 1997
29. Reema (2017) Cited by Tuladhar Impact of Credit Risk Management on Profitability of Nepalese Commercial Banks, Western Sydney University, Master's Thesis.
30. Roman and Dănuleşiu (2013) An Empirical Analysis of the Determinants of Bank Profitability in Romania. *Annales Universitatis Apulensis Series Oeconomica*, 15(2), 2013.
31. Wang (2014) what determines the profitability of banks? Evidence from the US ,Bachelor of Economics, Guangdong University of Foreign Studies, 2014 and Xuan Wang Bachelor of Accounting, Nanjing Audit University, 2010.
32. Saeed and Zahld (2016) The Impact of Credit Risk on Profitability of the Commercial Banks, *Journal of Business and Financial Affairs*, 2016.
33. Shibiru and Mebratu (2017) Ambo University, Ethiopia the Impact of Credit Risk Management on the Performance of Private Commercial Banks in Ethiopia.
34. Tesfaye (2014) the Determinants of Ethiopian Commercial Banks Performance. *European Journal of Business and Management*, Vol.6, No.14.

35. Tuladhar (2017) Impact of Credit Risk Management on Profitability of Nepalese Commercial Banks, Western Sydney University, Master's Thesis.
36. Zewude (2011) Credit Risk management and profitability of Commercial Banks in Ethiopia, MSE Thesis.

APPENDICES

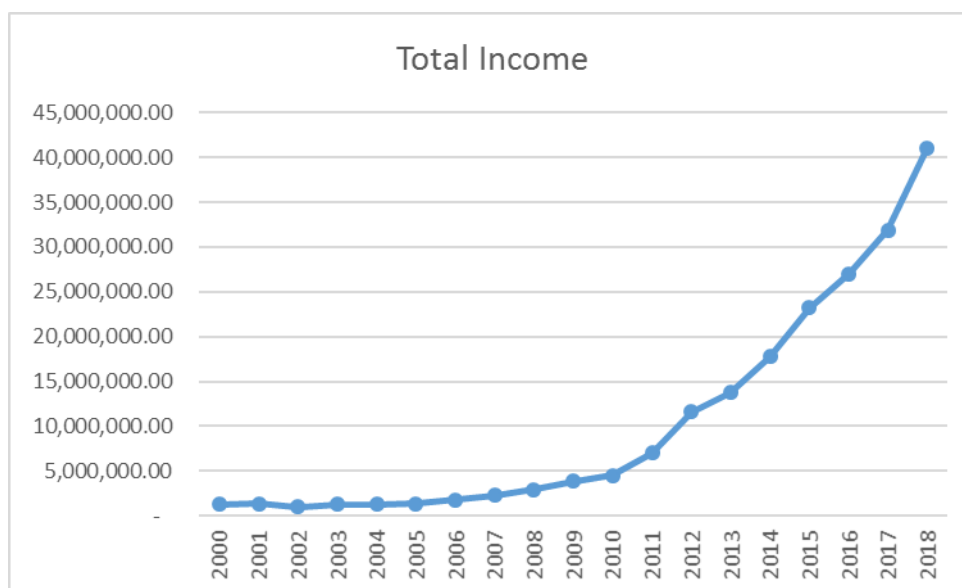
ANNEX I - Performance of the CBE during 2000-2018

In this section efforts been made to assess the trend of the CBE's financial performance by major indicators.

A. Income

The CBE's income has grown on the average 21.53 percent during 2000-2018. While the income of the bank shows fluctuating trend in 2000-2004, after 2005 it has shown an increasing trend.

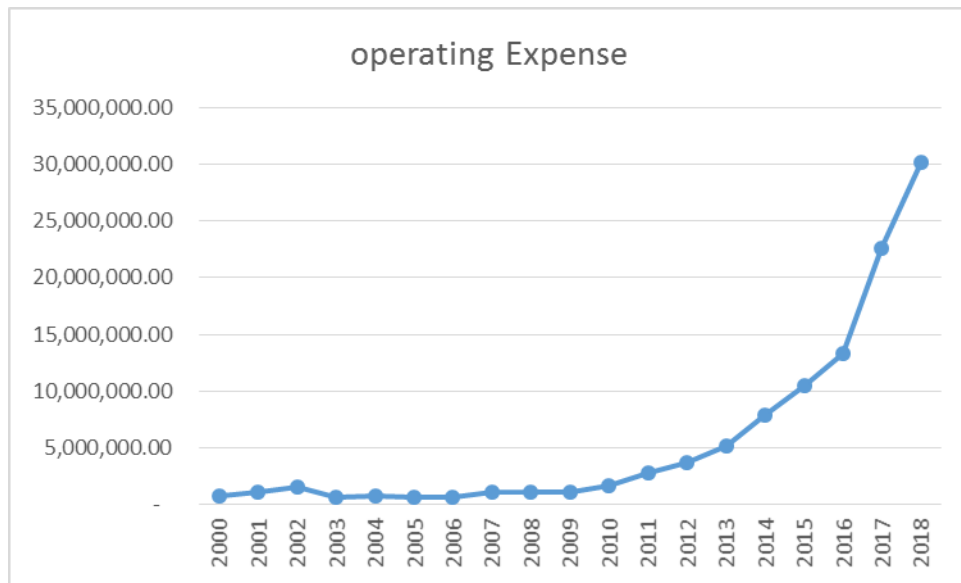
Figure: 1 TOT INCOME



B. Expense

The CBE's expense grew on the average by 15.28 percent from 2000-2018.. The trend of expense shows that an increase in 2001 and 2002 due to provision for doubtful accounts and audit adjustments in 2002 CBE (2001, 2002); in 2005, the expense of the bank decline due to decrease of provision for doubtful loans set aside for the year. Expense of the bank grows with higher margin in 2009 -2018 due to increase in saving deposit and volume of business of the bank in non-deposit activities CBE (2010, 2012, and 2013).

Figure: 2 OPERATING EXPENSE



C. Earning capacity

Both ROA and ROE of the CBE show a fluctuating trend. The CBE has displayed above the standard value in these measures during the considered years, except in the year 2000 up to 2003.

Figure: 3 ROA

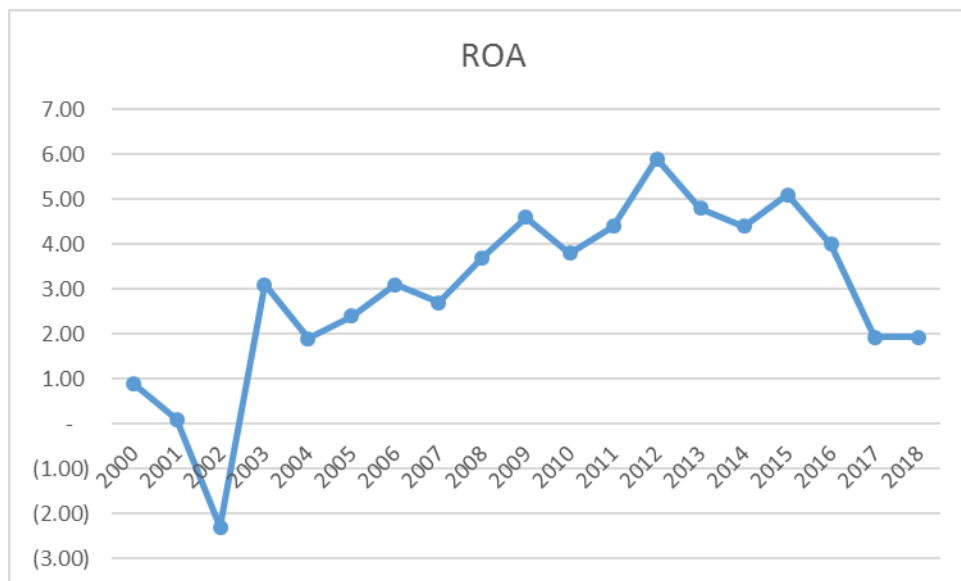
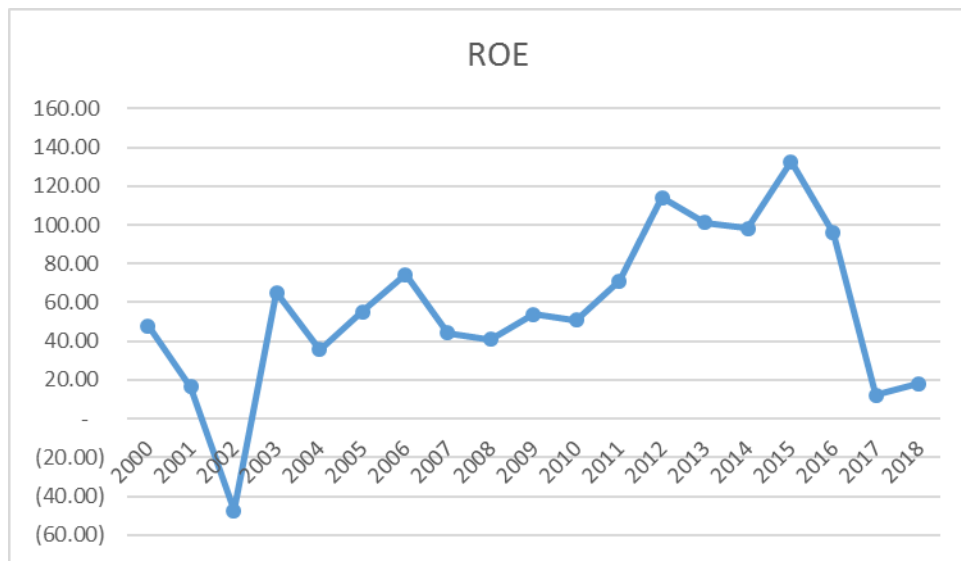


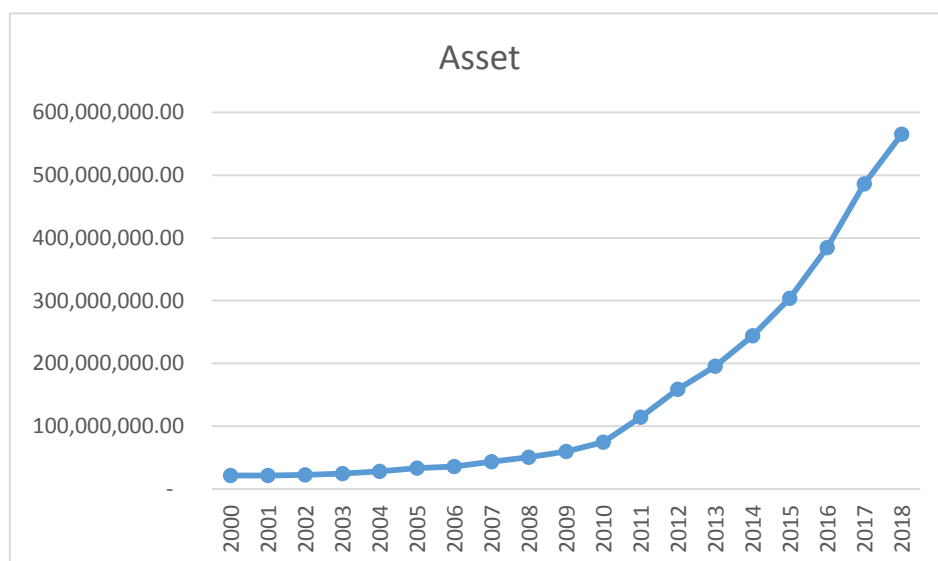
Figure: 4 ROE



D. Asset

The bank asset reached 565.5 Billion Birr as at June 30, 2018 by growing on average 16.3 percent during 2000- 2018. The highest growth rate (54.4 percent) in asset was observed in 2011. In terms of market share in the industry,

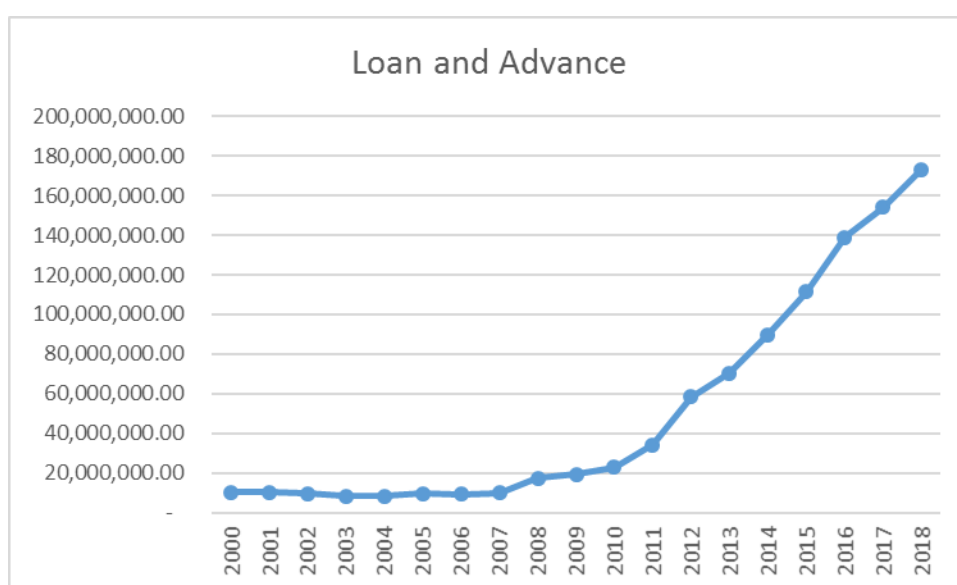
Figure: 5 ASSET



E. Loan and Advance

Outstanding loans and advance showed a declining trend on 2000-2004 and showed an increasing trend afterwards. Outstanding loans showed a big leap in 2008 and 2012 showing a growth rate of 77.7 percent and 70.5 percent, respectively.

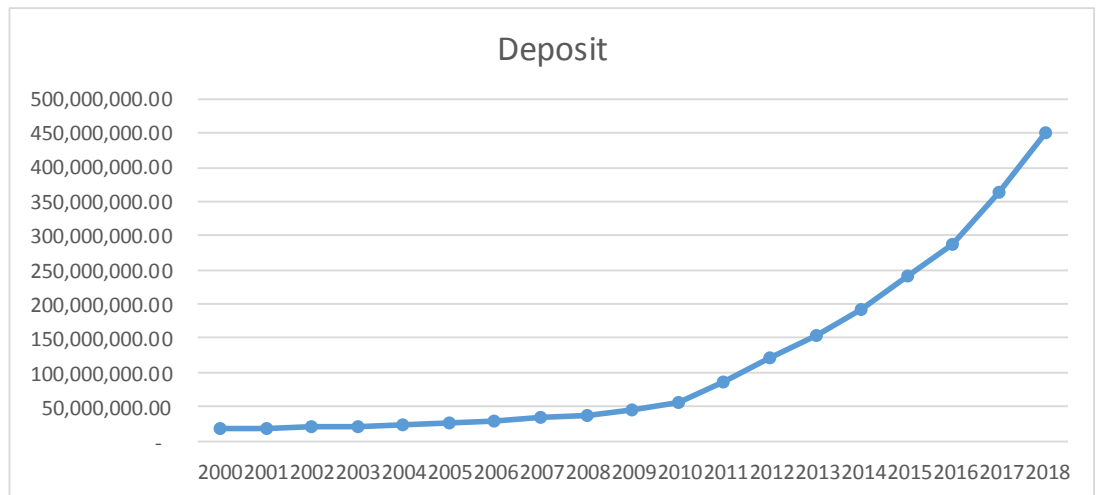
Figure: 6 LOAN & ADVANCE



F. Deposit

Deposit of the bank showed a continuous growth during the period under consideration with an average growth rate of 20 percent. Deposit has been increasing with highest margin since 2010 due to the deposit mobilization strategy of the bank. The opening of new bank branches in every corner of the country helped to broaden the bank's outreach; and this coupled with the favorable economic environment helped to increase the deposit base. The highest growth of 54.2 percent was observed in 2011.

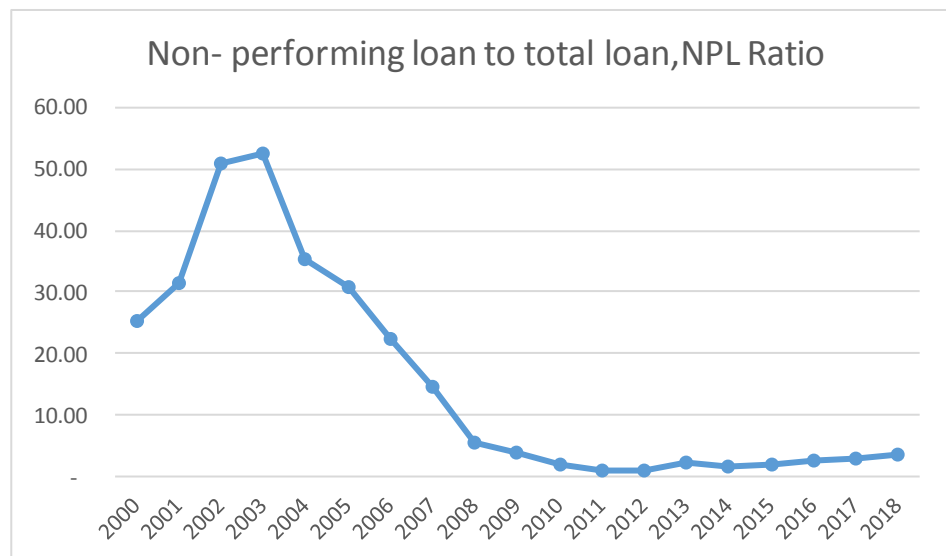
Figure: 7 DEPOSIT



G. Non-performing Loans (NPL)

The ratio of non-performing loans to total loans was the highest in 2003 at 52.4 percent and showed a declining trend since then.

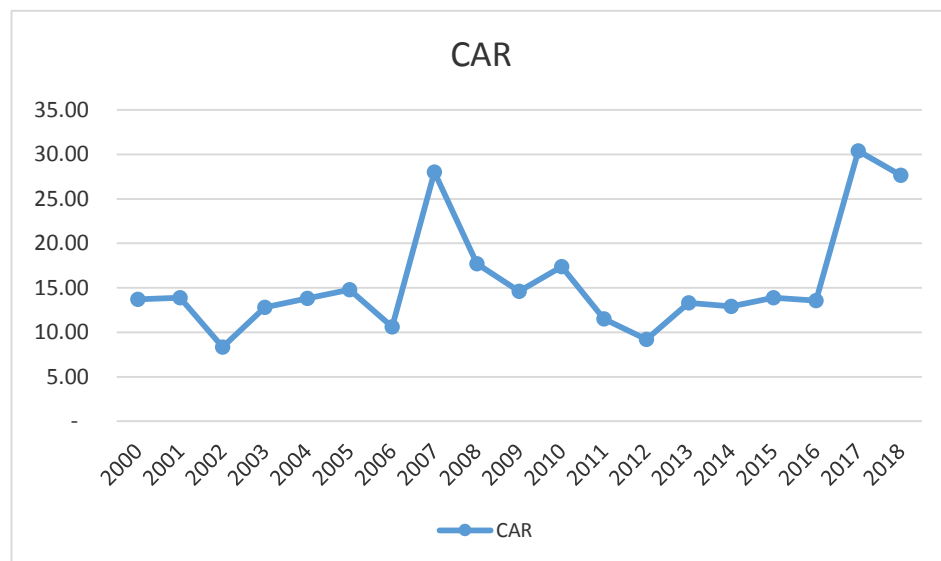
Figure: 8 Non- Performing Loan to Total Loan (NPL Ratio)



H. Capital Adequacy Ratio (CAR)

A ratio that measure a bank's financial strength and ability to undertake additional business. The ratio of Capital Adequacy Ratio (CAR) was the highest in 2017 at 30.38 percent and has showed a declining trend.

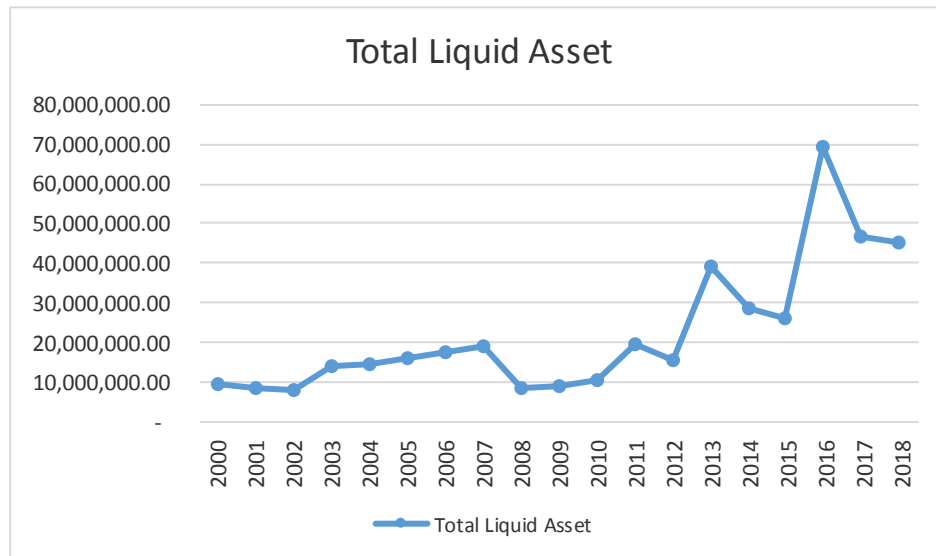
Figure: 9 Capital Adequacy Ratios



I. Liquid Asset

This is the ability of the bank to provide money on demand and observed as assets readily Convertible to cash without loss. The Liquid Asset was the highest in 2016.

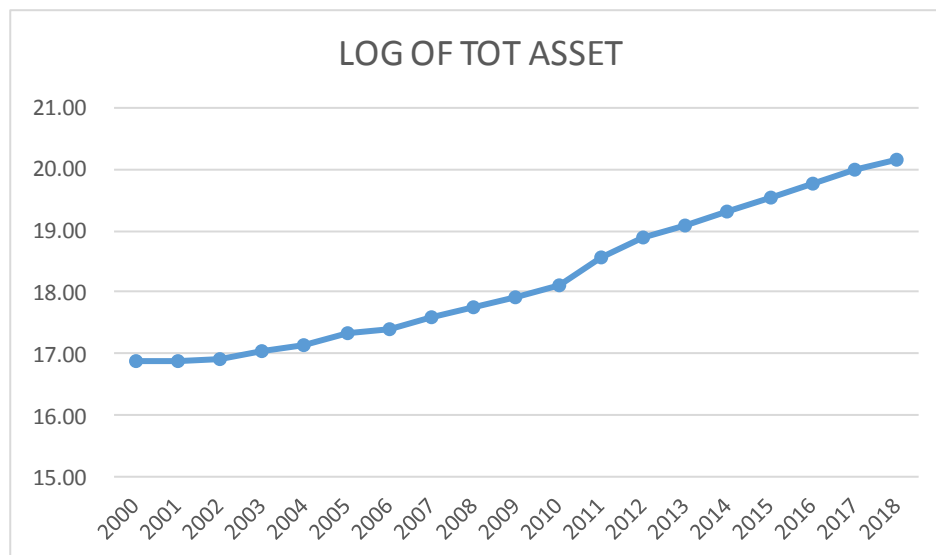
Figure: 10 Liquid Assets



J. Bank Size (LOGTA)

Bank size (LOGTA) is generally used to capture potential economies or diseconomies of scale in the banking sector. This variable controls for cost differences in product and risk diversification according to the size of the financial institution.

Figure: 11 Log of Total Asset



ANNEX II - EViews7 RESULTS

Normality Ttest

Table 4.1 Descriptive Statistics of Independent Variables

	CAR	LOTA	LR	ME	NII	NPLTL	TLTA	TLTD
Mean	15.6663	18.2195	39.0894	24.3631	36.5263	15.2321	34.3352	44.1647
Median	13.8000	17.9000	37.6000	21.8995	38.9699	3.66000	33.9500	44.6000
Maximum	30.3800	20.1532	75.5000	52.1911	54.1731	52.4200	47.8600	65.8000
Minimum	8.35000	16.8647	10.0500	12.6555	3.40000	0.74000	22.4900	29.6000
Std. Dev.	6.17720	1.14771	23.6394	10.5608	13.6708	17.5440	6.66959	8.52504
Skewness	1.37304	0.35388	0.28726	1.53732	-0.63172	0.95136	0.59215	0.78497
Kurtosis	3.76458	1.66351	1.59750	4.72279	2.87014	2.55595	3.02046	3.88331
Jarque-Bera	6.43276	1.81064	1.81852	9.83370	1.27710	3.02221	1.11070	2.56892
Probability	0.04010	0.40441	0.40282	0.00732	0.52805	0.22066	0.57387	0.27679
Sum	297.660	346.171	742.700	462.899	694.000	289.410	652.370	839.130
Sum Sq. Dev.	686.841	23.7106	10058.8	2007.57	3364.06	5540.26	800.702	1308.17
Observations	19	19	19	19	19	19	19	19

Multicollinearity Test

Table 4.2: Pair-wise Correlation of Explanatory Variables

	CAR	LOTA	LR	ME	NII	NPLTL	TLTA	TLTD
CAR	1.000000	0.369175	-0.15551	0.258488	-0.416852	0.237962	-0.295059	0.270118
LOTA	0.369175	1.000000	-0.846222	0.275533	-0.646761	0.775342	-0.175544	0.128188
LR	-0.15551	-0.846222	1.000000	0.181402	0.655093	0.741672	-0.188758	0.218597
ME	0.258488	-0.275533	0.181402	1.000000	-0.237635	0.488650	0.448572	0.298086
NII	-0.416852	-0.646761	0.655093	0.237635	1.000000	0.379019	-0.408962	-0.43504
NPLTL	-0.237962	-0.775342	0.741672	0.488650	0.379019	1.000000	0.234202	0.069716
TLTA	-0.295059	-0.175544	-0.188758	0.448572	-0.408962	0.234202	1.000000	0.959338
TLTD	-0.270118	-0.128188	-0.218597	0.298086	-0.43504	0.069716	0.959338	1.000000

I Regression and Diagnostic Test Result for ROE & ROA Model

Dependent Variable: ROE

Method: Least Squares

Date: 04/11/19 Time: 12:50

Sample: 2000 2018

Included observations: 19

ROE=C(1)+C(2)*CAR + C(3)*LOTA +C(4)*LR + C(5)*NPLTL + C(6)*TLTA +
C(7)*TLTD + C(8)*MEM +C(9)*NII

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-477.1204	320.9050	-1.486796	0.1679
C(2)	-1.465463	1.219572	-1.201620	0.2572
C(3)	31.68824	13.19791	2.401004	0.0373
C(4)	2.202639	0.684119	3.219672	0.0092
C(5)	-1.867006	0.814379	-2.292552	0.0448
C(6)	10.35443	5.682461	1.822173	0.0984
C(7)	-5.369696	3.871167	-1.387100	0.1955
C(8)	-69.73558	23.05309	-3.024999	0.0128
C(9)	0.431825	0.823313	0.524497	0.6114
R-squared	0.853719	Mean dependent var		51.47000
Adjusted R-squared	0.736694	S.D. dependent var		36.56337
S.E. of regression	18.76190	Akaike info criterion		9.007048
Sum squared resid	3520.089	Schwarz criterion		9.454414
Log likelihood	-76.56696	Hannan-Quinn criter.		9.082760
F-statistic	7.295181	Durbin-Watson stat		2.870185
Prob(F-statistic)	0.002544			

Dependent Variable: ROA

Method: Least Squares

Date: 04/11/19 Time: 12:48

Sample: 2000 2018

Included observations: 19

$ROA = C(1) + C(2)*CAR + C(3)*LOTA + C(4)*LR + C(5)*NPLTL + C(6)*TLTA + C(7)*TLTD + C(8)*MEM + C(9)*NII$

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-6.966218	12.75786	-0.546033	0.5970
C(2)	-0.009291	0.048485	-0.191630	0.8519
C(3)	0.894827	0.524695	1.705425	0.1189
C(4)	0.049617	0.027198	1.824301	0.0981
C(5)	-0.075893	0.032376	-2.344088	0.0411
C(6)	0.301737	0.225911	1.335643	0.2113
C(7)	-0.176116	0.153902	-1.144340	0.2791
C(8)	-3.470932	0.916496	-3.787177	0.0036
C(9)	0.032113	0.032732	0.981110	0.3497

R-squared	0.915286	Mean dependent var	2.899474
Adjusted R-squared	0.847515	S.D. dependent var	1.910138
S.E. of regression	0.745896	Akaike info criterion	2.557053
Sum squared resid	5.563605	Schwarz criterion	3.004419
Log likelihood	-15.29200	Hannan-Quinn criter.	2.632765
F-statistic	13.50556	Durbin-Watson stat	3.366301
Prob(F-statistic)	0.000196		

I Variance Inflation Factor Test on ROA & ROE Model

Variance Inflation Factors
Date: 04/11/19 Time: 12:48
Sample: 2000 2018
Included observations: 19

Variable	Coefficient Variance	Un centered VIF	Centered VIF
C(1)	162.7630	5558.440	NA
C(2)	0.002351	22.60588	2.902136
C(3)	0.275304	3132.682	11.73277
C(4)	0.000740	51.97346	13.37385
C(5)	0.001048	18.74393	10.43829
C(6)	0.051036	2128.174	73.44980
C(7)	0.023686	1633.431	55.69247
C(8)	0.839965	283.1606	3.856018
C(9)	0.001071	55.29178	6.478005

Variance Inflation Factors
Date: 04/11/19 Time: 12:51
Sample: 2000 2018
Included observations: 19

Variable	Coefficient Variance	Un centered VIF	Centered VIF
C(1)	102980.0	5558.440	NA
C(2)	1.487356	22.60588	2.902136
C(3)	174.1849	3132.682	11.73277
C(4)	0.468019	51.97346	13.37385
C(5)	0.663213	18.74393	10.43829
C(6)	32.29036	2128.174	73.44980
C(7)	14.98594	1633.431	55.69247
C(8)	531.4451	283.1606	3.856018
C(9)	0.677845	55.29178	6.478005

Table 4.3: Amended Pair-wise Correlation of Explanatory Variables

	CAR	LR	ME	NII	NPLTL	TLTA
CAR	1.000000	-0.15551	0.258488	-0.416852	-0.237962	-0.295059
LR	-0.15551	1.000000	0.181402	0.655093	0.741672	-0.188758
ME	0.258488	0.181402	1.000000	-0.237635	0.488650	0.448572
NII	-0.416852	0.655093	-0.237635	1.000000	0.379019	-0.408962
NPLTL	-0.237962	0.741672	0.488650	0.379019	1.000000	0.234202
TLTA	-0.295059	-0.188758	0.448572	-0.408962	0.234202	1.000000

II Regression and Diagnostic Test Result for ROA Model

Dependent Variable: ROA
 Method: Least Squares
 Date: 04/11/19 Time: 12:30
 Sample: 2000 2018
 Included observations: 19

$$ROA=C(1)+C(2)*CAR + C(3)*LR + C(4)*NPLTL + C(5)*TLTA +C(6)*MEM + C(7)*NII$$

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	13.63781	3.094418	4.407228	0.0009
C(2) CAR	-0.039797	0.051664	-0.770294	0.4560
C(3)LR	0.001097	0.016825	0.065199	0.9491
C(4)NPLTL	-0.051874	0.022198	-2.336860	0.0376
C(5)TLTA	-0.032445	0.048563	-0.668101	0.5167
C(6)MEM	-2.735419	0.851548	-3.212289	0.0075
C(7)NII	0.007721	0.026925	0.286750	0.7792

R-squared	0.873411	Mean dependent var	2.899474
Adjusted R-squared	0.810117	S.D. dependent var	1.910138
S.E. of regression	0.832354	Akaike info criterion	2.748192
Sum squared resid	8.313757	Schwarz criterion	3.096143
Log likelihood	-19.10782	Hannan-Quinn criter.	2.807079
F-statistic	13.79919	Durbin-Watson stat	2.620978
Prob(F-statistic)	0.000092		

II Regression and Diagnostic Test Result for ROE Model

Dependent Variable: ROE
 Method: Least Squares
 Date: 04/11/19 Time: 12:36
 Sample: 2000 2018
 Included observations: 19

$$\text{ROE} = \text{C}(1) + \text{C}(2) * \text{CAR} + \text{C}(3) * \text{LR} + \text{C}(4) * \text{NPLTL} + \text{C}(5) * \text{TLTA} + \text{C}(6) * \text{MEM} + \text{C}(7) * \text{NII}$$

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	255.0043	87.62523	2.910170	0.0131
C(2) CAR	-2.476455	1.462992	-1.692733	0.1163
C(3)LR	0.590563	0.476427	1.239569	0.2388
C(4)NPLTL	-1.157228	0.628595	-1.840975	0.0905
C(5)TLTA	-0.217133	1.375168	-0.157896	0.8772
C(6)MEM	-46.58354	24.11346	-1.931848	0.0773
C(7)NII	-0.475840	0.762454	-0.624091	0.5443

R-squared	0.722966	Mean dependent var	51.47000
Adjusted R-squared	0.584449	S.D. dependent var	36.56337
S.E. of regression	23.56993	Akaike info criterion	9.435130
Sum squared resid	6666.499	Schwarz criterion	9.783081
Log likelihood	-82.63374	Hannan-Quinn criter.	9.494017
F-statistic	5.219334	Durbin-Watson stat	1.859885
Prob(F-statistic)	0.007375		

II Variance Inflation Factor Test on ROA & ROE model

Variance Inflation Factors
 Date: 04/11/19 Time: 12:31
 Sample: 2000 2018
 Included observations: 19
 ROA

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C(1)	9.575422	262.6004	NA
C(2) CAR	0.002669	20.61233	2.646206
C(3)LR	0.000283	15.97156	4.109815
C(4)NPLTL	0.000493	7.075978	3.940537
C(5)TLTA	0.002358	78.97384	2.725629
C(6)MEM	0.725134	196.3046	2.673233
C(7)NII	0.000725	30.04655	3.520265

Variance Inflation Factors
 Date: 04/11/19 Time: 12:36
 Sample: 2000 2018
 Included observations: 19 ROE

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C(1)	7678.182	262.6004	NA
C(2) CAR	2.140345	20.61233	2.646206
C(3)LR	0.226982	15.97156	4.109815
C(4)NPLTL	0.395132	7.075978	3.940537
C(5)TLTA	1.891088	78.97384	2.725629
C(6)MEM	581.4588	196.3046	2.673233
C(7)NII	0.581336	30.04655	3.520265

Heteroscedastic Test

ROA - Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.690122	Prob. F(6,12)	0.0259
Obs*R-squared	12.32176	Prob. Chi-Square(6)	0.0552
Scaled explained SS	3.603070	Prob. Chi-Square(6)	0.7302

Test Equation:
 Dependent Variable: RESID^2
 Method: Least Squares
 Date: 04/11/19 Time: 12:32
 Sample: 2000 2018
 Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.853255	1.469408	0.580680	0.5722
CAR	0.037852	0.024533	1.542897	0.1488
LR	-0.010783	0.007989	-1.349670	0.2020
NPLTL	0.037813	0.010541	3.587259	0.0037
TLTA	0.025558	0.023061	1.108293	0.2895
MEM	-0.753607	0.404364	-1.863684	0.0870
NII	0.008510	0.012786	0.665595	0.5183

R-squared	0.648514	Mean dependent var	0.437566
Adjusted R-squared	0.472770	S.D. dependent var	0.544342
S.E. of regression	0.395250	Akaike info criterion	1.258711
Sum squared resid	1.874667	Schwarz criterion	1.606662
Log likelihood	-4.957757	Hannan-Quinn criter.	1.317598
F-statistic	3.690122	Durbin-Watson stat	2.505922
Prob(F-statistic)	0.025876		

ROE - Heteroskedasticity Test: Breusch-Pagan-Godfrey

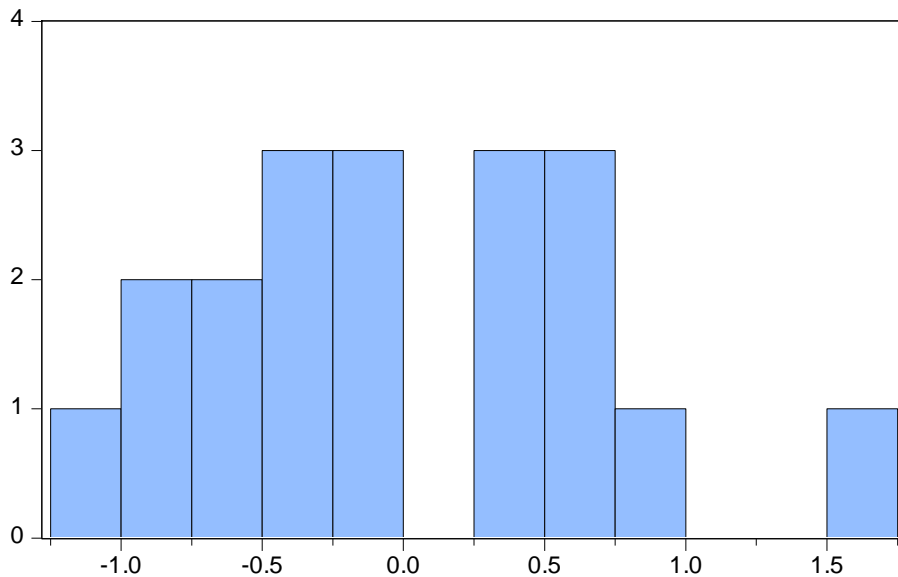
F-statistic	1.139217	Prob. F(6,12)	0.3974
Obs*R-squared	6.895070	Prob. Chi-Square(6)	0.3307
Scaled explained SS	1.437018	Prob. Chi-Square(6)	0.9636

Test Equation:
 Dependent Variable: RESID^2
 Method: Least Squares
 Date: 04/11/19 Time: 12:36
 Sample: 2000 2018
 Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	55.56146	1339.229	0.041488	0.9676
CAR	27.41596	22.35977	1.226129	0.2437
LR	-11.08102	7.281511	-1.521802	0.1540
NPLTL	12.49664	9.607191	1.300759	0.2178
TLTA	20.84368	21.01752	0.991729	0.3409
MEM	-438.5930	368.5403	-1.190082	0.2570
NII	20.84830	11.65303	1.789087	0.0989

R-squared	0.362898	Mean dependent var	350.8683
Adjusted R-squared	0.044348	S.D. dependent var	368.4969
S.E. of regression	360.2333	Akaike info criterion	14.88869
Sum squared resid	1557216.	Schwarz criterion	15.23664
Log likelihood	-134.4426	Hannan-Quinn criter.	14.94758
F-statistic	1.139217	Durbin-Watson stat	2.489046
Prob(F-statistic)	0.397427		

ROA

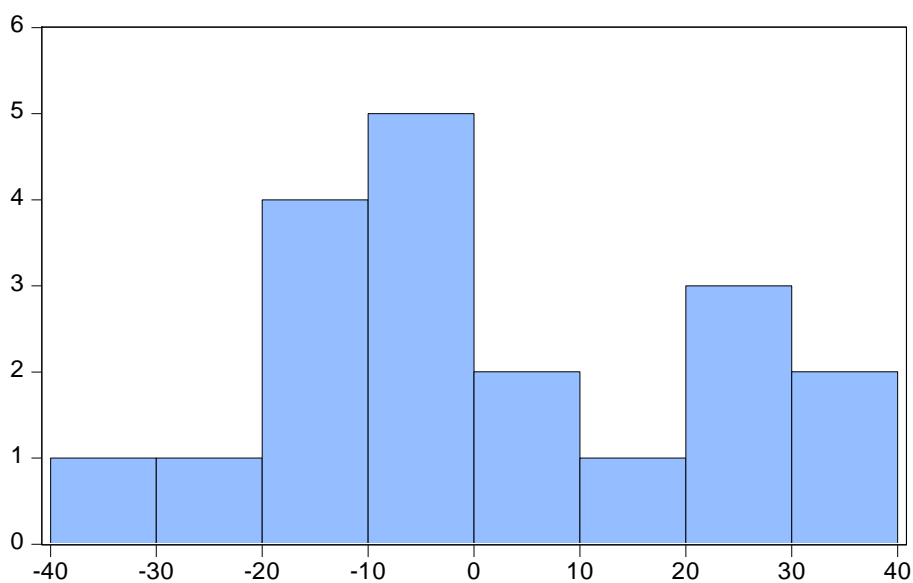


Series: Residuals
Sample 2000 2018
Observations 19

Mean	3.68e-15
Median	-0.105475
Maximum	1.523891
Minimum	-1.077969
Std. Dev.	0.679614
Skewness	0.366672
Kurtosis	2.466137

Jarque-Bera	0.651386
Probability	0.722027

ROE



Series: Residuals
Sample 2000 2018
Observations 19

Mean	9.55e-14
Median	-3.741119
Maximum	34.78614
Minimum	-30.77498
Std. Dev.	19.24477
Skewness	0.327756
Kurtosis	2.044956

Jarque-Bera	1.062262
Probability	0.587940

The Stability Test

Ramsey RESET Test

Equation: UNTITLED

Specification: ROA C CAR LR NPLTL TLTA MEM NII

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.088225	11	0.2998
F-statistic	1.184234	(1, 11)	0.2998
Likelihood ratio	1.942704	1	0.1634

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.808047	1	0.808047
Restricted SSR	8.313757	12	0.692813
Unrestricted SSR	7.505710	11	0.682337
Unrestricted SSR	7.505710	11	0.682337

LR test summary:

	Value	df
Restricted LogL	-19.10782	12
Unrestricted LogL	-18.13647	11

Unrestricted Test Equation:

Dependent Variable: ROA

Method: Least Squares

Date: 04/11/19 Time: 12:35

Sample: 2000 2018

Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.10023	4.421987	3.867092	0.0026
CAR	-0.058502	0.054077	-1.081835	0.3025
LR	-0.013250	0.021274	-0.622810	0.5461
NPLTL	-0.066965	0.026031	-2.572512	0.0259
TLTA	-0.023263	0.048928	-0.475449	0.6438
MEM	-3.584257	1.150045	-3.116625	0.0098
NII	0.032968	0.035388	0.931633	0.3715
FITTED^2	-0.084673	0.077809	-1.088225	0.2998

R-squared	0.885715	Mean dependent var	2.899474
Adjusted R-squared	0.812988	S.D. dependent var	1.910138
S.E. of regression	0.826037	Akaike info criterion	2.751207
Sum squared resid	7.505710	Schwarz criterion	3.148866
Log likelihood	-18.13647	Hannan-Quinn criter.	2.818507
F-statistic	12.17864	Durbin-Watson stat	2.827184
Prob(F-statistic)	0.000216		

Ramsey RESET Test
Equation: UNTITLED
Specification: ROE C CAR LR NPLTL TLTA MEM NII
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.355706	11	0.2024
F-statistic	1.837938	(1, 11)	0.2024
Likelihood ratio	2.935678	1	0.0866

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	954.4063	1	954.4063
Restricted SSR	6666.499	12	555.5416
Unrestricted SSR	5712.092	11	519.2811
Unrestricted SSR	5712.092	11	519.2811

LR test summary:

	Value	df
Restricted LogL	-82.63374	12
Unrestricted LogL	-81.16590	11

Unrestricted Test Equation:
Dependent Variable: ROE
Method: Least Squares
Date: 04/11/19 Time: 12:38
Sample: 2000 2018
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	423.6764	150.5207	2.814738	0.0168
CAR	-4.584882	2.102230	-2.180962	0.0518
LR	0.539271	0.462167	1.166832	0.2680
NPLTL	-1.805448	0.773280	-2.334793	0.0395
TLTA	-0.101574	1.332262	-0.076242	0.9406
MEM	-78.88331	33.33377	-2.366468	0.0374
NII	-0.232910	0.758618	-0.307019	0.7646
FITTED^2	-0.010047	0.007411	-1.355706	0.2024

R-squared	0.762628	Mean dependent var	51.47000
Adjusted R-squared	0.611572	S.D. dependent var	36.56337
S.E. of regression	22.78774	Akaike info criterion	9.385884
Sum squared resid	5712.092	Schwarz criterion	9.783543
Log likelihood	-81.16590	Hannan-Quinn criter.	9.453184
F-statistic	5.048668	Durbin-Watson stat	1.682997
Prob(F-statistic)	0.008860		

ANNEX - III RAW DATA

Table A

('000 Birr)							
year	ROA	ROE	CAR	Asset	Deposit	Loan and Advance	Loan & Advance with bond
2000	0.9	48	13.7	21,100,000.00	17,083,613.00	10,098,976.00	12,967,896.00
2001	0.1	16.5	13.9	21,489,000.00	18,983,544.59	10,283,540.90	17,366,844.03
2002	-2.3	-47.3	8.35	22,146,000.00	19,744,234.23	9,695,774.00	18,035,068.10
2003	3.1	65.1	12.8	24,629,000.00	21,307,583.73	8,361,001.85	18,592,788.14
2004	1.9	35.5	14.8	27,869,000.00	22,973,235.63	8,134,957.00	21,168,935.49
2005	2.4	55.2	13.8	33,172,000.00	25,869,968.38	9,556,421.20	16,612,741.59
2006	3.1	74.3	10.6	35,827,000.00	28,663,567.14	9,295,458.20	21,881,095.11
2007	2.7	44.2	28	43,389,000.00	33,629,909.42	9,758,674.00	22,766,132.22
2008	3.7	40.9	17.7	50,335,100.00	37,633,285.22	17,338,526.15	23,850,162.85
2009	4.6	53.9	14.6	59,411,700.00	44,814,332.47	19,375,593.97	24,779,779.70
2010	3.8	51	17.4	74,187,000.00	56,096,741.65	22,859,028.89	42,774,341.89
2011	4.4	71	11.5	114,265,100.00	86,499,249.57	34,217,685.54	77,148,589.92
2012	5.9	114.1	9.2	158,854,000.00	122,184,635.86	58,326,982.51	122,826,396.81
2013	4.8	101.2	13.3	195,443,000.00	154,528,895.52	70,432,282.52	152,268,854.45
2014	4.4	98	12.9	244,128,000.00	193,320,069.76	89,665,182.40	201,429,943.66
2015	4.18	67.97	13.9	303,644,000.00	241,732,234.84	111,435,273.13	265,364,941.56
2016	3.56	58.21	13.6	384,420,000.00	288,551,118.02	138,799,997.39	328,313,773.32
2017	1.92	12.09	30.4	485,927,000.00	364,861,625.50	154,164,013.09	408,101,929.93
2018	1.93	18.06	27.6	565,531,000.00	451,839,696.59	173,294,355.55	481,559,495.66

Table B

('000 Birr)

year	NPL	Total Liquid Asset	Liquidity Ratio (LIQ. ASSE)	loan to deposit ratio Annual Report	Total loan to Total Asset	Non-performing loan to Total Loan (NPL) Ratio
2000	2,534,340.00	9,300,000.00	59.2	65.8	47.86	25.1
2001	3,237,208.00	8,500,000.00	48.6	59.8	47.85	31.48
2002	4,922,542.00	7,930,000.00	43	49.6	43.78	50.77
2003	4,382,984.80	13,869,000.00	71	41	33.95	52.42
2004	2,876,012.00	14,183,006.38	73.8	35.1	29.19	35.35
2005	2,953,688.00	16,047,211.00	68.8	38.4	28.81	30.91
2006	2,087,306.00	17,396,094.00	65.4	33.1	25.95	22.46
2007	1,418,331.00	18,733,763.00	75.5	29.6	22.49	14.53
2008	923,459.23	8,523,696.00	38.4	46.07	34.45	5.33
2009	708,569.24	8,755,398.00	28.1	44.6	32.61	3.66
2010	397,602.70	10,469,718.00	37.6	42	30.81	1.74
2011	293,369.85	19,313,302.90	22.7	39.56	29.95	0.86
2012	430,350.67	15,345,089.80	12.8	47.74	36.72	0.74
2013	1,567,143.46	39,231,809.00	25.4	45.58	36.04	2.23
2014	1,272,745.60	28,782,087.00	14.8	46.38	36.73	1.42
2015	1,987,872.92	26,002,643.00	10.8	46.1	36.7	1.78
2016	3,407,360.98	69,156,246.00	24	48.1	36.11	2.45
2017	4,360,701.39	46,804,000.00	12.8	42.25	31.73	2.83
2018	5,810,927.49	45,389,000.00	10.1	38.35	30.64	3.35

Table C

Year	Non Intrest I/C(NII)	Mgt Efficiency (MEM)	Log of Tot Asset(LOTA)
2000	24.41	28.90	16.86
2001	26.51	31.87	16.88
2002	41.59	39.40	16.91
2003	48.50	19.29	17.02
2004	46.20	21.20	17.14
2005	53.52	20.96	17.32
2006	53.97	18.36	17.39
2007	54.17	15.52	17.59
2008	47.96	18.03	17.73
2009	38.72	15.96	17.90
2010	38.97	16.56	18.12
2011	41.64	15.97	18.55
2012	42.08	14.48	18.88
2013	30.51	17.34	19.09
2014	32.59	19.32	19.31
2015	27.76	21.04	19.53
2016	20.68	23.74	19.77
2017	18.55	28.85	20.00
2018	12.41	35.90	20.15