



ADDISABABA UNIVERSITY

COLLAGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

**EFFECT OF CREDIT RISK MANAGEMENT ON THE PERFORMANCE OF
COMMERCIAL BANKS IN ETHIOPIA**

BY

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ADDIS ABABA, ETHIOPIA

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This is to certify that the thesis prepared by Bethelhem Belay entitled “*Effect of Credit Risk Management on the Performance Of Commercial Banks In Ethiopia*”, which is submitted in partial fulfillment of the requirements for the Degree of Masters in Accounting and Finance, complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university and that all sources of materials used for the thesis have been duly acknowledged.

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Table of contents

Acknowledgements.....	i
List of Tables	iv
List of Figures	v
Abstract.....	vii
CHAPTER ONE	1
1. INTRODUCTION	1
1.1. BACKGROUND OF THE STUDY	1
1.2. Statement of the Problem	2
1.3. Research questions	3
1.4. Objective of the study	4
1.4.1. General objective	4
1.4.2. Specific objectives	4
1.5. Significance of the study	4
1.6. Scope of the study	5
1.7 Limitation of the study	5
1.8. Organization of the paper.....	5
CHAPTER Two	6
2. REVIEW OF RELATED LITERATURE	6
2.1. Introduction	6
2.2. Theoretical and Conceptual Review	6
2.2.1. Risk.....	6
2.2.2. Types of bank risk	6
2.2.3. Credit risk	7
2.2.4. Managing credit risk.....	9
2.2.5. Credit risk measurement framework	9
2.2.6. Credit assessment and risk grading	9
2.2.7. Bank risk management system	10
2.2.8. Credit portfolio management.....	11
2.2.9. Determinants of financial performance in commercial banks.....	12
2.2.10. Relationship between credit risk management and bank performance	13
2.3. Review of empirical studies	14
2.4. Summary and Literature Gap	19
2.5. Conceptual Framework	20

CHAPTER THREE	21
3. RESEARCH METHODOLOGY.....	21
3.1. Introduction.....	21
3.2. Research Design.....	21
3.3. Research approach.....	21
3.3. Target population	21
3.4. Sample size and Sampling technique	21
3.5. Source of data and collection techniques	22
3.6. Definition of variables and a priori assumption	22
3.7. Model specification.....	23
3.8. Method of data analysis.....	24
3.9. Validity and Reliability of Data	24
CHAPTER FOUR.....	25
4. DATA ANALYSIS AND DISCUSSION	25
4.1. Introduction.....	25
4.2. Descriptive statistics.....	25
4.3. Trend statistics.....	27
4.4. Testing the Classical Linear Regression Model (CLRM) Assumptions	31
4.4.1. Unusual and influential data	31
4.4.2. Checking normality	31
4.4.3. Checking Homoscedasticity	32
4.4.4. Checking for multicollinearity.....	32
4.4.5. Checking linearity.....	34
4.4.6. Model specification	34
4.5. Regression Analysis	35
4.6. Discussion of the Result.....	37
CHAPTER FIVE	39
5. SUMMERY, CONCLUSION AND RECOMMENDATION	39
5.1. Summary of Major Findings	39
5.2. Conclusion.....	39
5.3. Recommendation.....	41
REFERENCES	43
Appendices.....	45

List of Tables

Table 4.1 Descriptive statistics 25

Table 4.2 Cook’s D assumption..... 31

Table 4.3 Checking normality..... 322

Table4.4 Checking Homoscedasticity 32

Table 4.5 Checking for multicollinearity 32

Table 4.6 correlation matrix..... 33

Table 4.7 Model specification (The link test) 34

Table 4.8 model specification (ovtest)..... 35

Table 4.9 Regression output 36

List of Figures

Figure 2.1 Conceptual framework of the study	20
Figure 4.1 Return on assets (ROA).....	27
Figure 4.2 Provision for Total Loan (PRTL)	28
Figure 4.3 Cost per Loan Asset (CLA)	29
Figure 4.4 Loan to total asset (LTA)	30
Figure 4.5 Bank Size (log TA).....	30

List of Abbreviations and Acronyms

AB	Abay Bank S.C
BCBS	Basel Committee on Banking Supervision
BOA	Bank of Abyssinia S.C
CBE	Commercial Bank of Ethiopia
CBO	Cooperative Bank of Oromia S.C
CRM	Credit Risk Management
NBE	National Bank of Ethiopia
NIB	Nib International Bank S.C
OIB	Oromia International Bank S.C
UB	United Bank S.C
WB	Wegagen Bank S.C

Abstract

The objective of the study is to empirically examine 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 (2013-2017). The empirical investigation uses the accounting measure of Return on Assets (ROA), which is the dependent variable, to represent Banks' performance. The study fundamentally involves both descriptive and econometrics techniques. The econometrics method used in the study basically involves assessing the impact of selected internal variables, the provision to total loans, loan to total asset, credit administration (cost to total loans) and natural logarithm of total asset (Economies of scale), on the performance of the banking sector. To this end multiple linear regressions model is used to measure the explanatory power of the independent variables above on a dependent variable. Basic descriptive statistics was applied for trend analysis. 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. However, a certain variation in the magnitude and direction of their effect on the selected profitability measure, Return on Asset. Based on the study it is recommended that Ethiopian banks need to develop their credit risk management capacity, there should also be control over overhead costs related to lending, and increasing the loan book size without compromising the sound credit planning should be a priority task.

Keywords: Effect, Credit Risk, Bank, Performance, Ethiopia

CHAPTER ONE

1. INTRODUCTION

1.1. BACKGROUND OF THE STUDY

Bank is commercial or state institution that provides financial services, including issuing money in various forms, receiving deposits of money, lending money and processing transactions and creating of credit (Campbell, 2007).

Commercial bank is an institution that provides financial service such as accepting deposit, lending money, and processing transactions and creating of credit (Campbell, 2007)

The role of commercial banks in Ethiopia remain central in financing economic activity and its effectiveness could exert positive effect on overall economy as a sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of financial system (Athanasoglou, Brissimis, and Delis (2005).

Risk management is human activity which involves recognition of risk, risk assessment, developing strategies to manage it, and mitigation of risk using managerial resources, whereas credit risk is risk of loss due to debtor 's none-payment of loan or other line of credit (either the principal or interest or both) (Campbell, 2007)

Credit remains the primary source of revenue for commercial banks in Ethiopia. However the probability of default borrowers' loan commitments has been an increasing concern for those banks particularly for unsecured loans.

Credit risk is the situation that a contractual party will fail to meet its obligations in accordance with the agreed terms (Brown and Moles, 2012). The Basel committee on banking supervision (2001) also defined it as the possibility of losing the outstanding loan partially or totally, due to credit events (Default risk).

Credit risk is the most significant risk faced by commercial banks and the success of their business depends on accurate measurement and efficient management of this risk to great extent than any other risk (Giesecke, 2004

During appraisal process, credit risk analysis is meant to minimize the potential loss to acceptable risk level (Derelioglu and Gurgun, 2011)

Most of Ethiopian commercial banks recorded significant amount for loans and advances and thus may face credit risk. All commercial banks financial statement for the year (2013-2017) is taken as a data point to look at their provision for loans and advances. Among the risks that commercial banks face, credit risk is one of great concern to most bank authorities and banking regulators. This is because credit risk is that risk that can easily and most likely prompts bank failure.

Currently in Ethiopia under the provision of national bank of Ethiopia there are eighteen commercial banks. Out of which seventeen are private owned and one is government owned.

The performance of banks and other institutions have been measured using a combination of ratio analysis, benchmarking, measuring performance against budget or a mix of these methodologies Artikiran (2010). ROE and ROA are the most commonly used ratios. Foong (2008), indicated that efficiency in banks can be measured using ROE which illustrates to what extent banks use reinvested income to generate future profit.

The determinants of banks performance have attracted the interest of research as well as bank management, financial markets and bank supervisors. Achou and Tenguh ,(2008) shows that there is significant relationship between the bank performance and credit risk management.

1.2. Statement of the Problem

Banks are in risky business as they perform their role of financial intermediation in the economy. Consequently, they assume various risks which include credit risk, interest rate risk liquidity risk, foreign exchange risk and operational risk. Managing these risks is essential for their survival and prosperity. Losses from a single loan or material breakdown in controls can eliminate the gain on many other transactions (National bank of Ethiopia, 2010)

Credit risks possess a significant exposure not only to the banks (lenders) but also to the entire economy, which is evident in 2008 financial crises. This shows the fact that the banking sector is the backbone of any economy.

The main aim of every banking institution is to operate profitably in order to maintain stability and improve in growth and expansion. To insure that the growth in the banking sector does not jeopardize its stability, risk management is crucial. Major objective of bank management is to

increase shareholders return epitomizing bank performance. This objective often comes at the cost of increasing risk. Issues of risk management in banking sector have great effect not only on the bank but also on the economic growth.

Majority of Ethiopian commercial banks recorded a huge amount of provision for their loans and advances (financial statement,(2013-2017) these banks recorded an average of 3.7% provision for loans and advances for the period (2013 – 2017) as shown from banks' financial statements. But provision for loans and advances under normal status as per National bank of Ethiopia directive No, SBB43/2007 one percent of the total loan and advance has to be recorded as provision; however, the provision is almost more than double from the set standard.

There are various researches made to see the effect of credit risk in commercial banks in Ethiopia. Tseganesh /2012/ investigated some of bank specific and macro-economic factors affecting banks liquidity and their effect on financial performance. Misker Bizuayehu, (2015) focused on industry specific factors and macro-economic factors on banks profitability in Ethiopia. Elias (2015) focused on the relationship between bank liquidity ratio and bank performance.

Most of the studies done on commercial banks in Ethiopia are focused on issues related to macro-economic factors however not in-depth studies are done with regard to internal variables or bank specific factors and its effect on performance by using secondary data. This and other problems lead to motivate and identify the effect of credit risk management on the performance of commercial banks in Ethiopia. Thus the study tried to fill the gap with respect to the objectives considered in the study.

1.3. Research questions

1. What is the effect of provision to total loan on the performance of commercial banks in Ethiopia?
2. What is the effect of cost per loan asset on the performance of commercial banks in Ethiopia?
3. What is the effect of loan to total asset on the performance of commercial banks in Ethiopia?
4. What is the effect of bank size on the performance of commercial banks in Ethiopia?

1.4. Objective of the study

1.4.1. General objective

The general objective of the study is to analyze the effect of credit risk management tools on the performance of commercial banks in Ethiopia

1.4.2. Specific objectives

- To examine the effect of provision to total loan on the performance of commercial banks in Ethiopia.
- To analyze the effect of cost per loan asset on the performance of commercial banks in Ethiopia.
- To examine the effects of loan to total asset on the performance of commercial banks in Ethiopia.
- To examine the effects of bank size on the performance of commercial banks in Ethiopia.

1.5. Significance of the study

The aim of this study was to improve not only the researchers scope of understanding on credit risk management but also it provides an insight in to the best credit risk management practices that can be adopted in order to enhance performance in the banking industry.

The study would help to create awareness among the management and various regulators regarding the effect of credit risk management on the performance of commercial banks in Ethiopia. This study is expected to fill the gap that exists in prior researches related to effect of credit risk management on the performance of commercial banks in Ethiopia.

The study help to minimize the damaging effect of credit risk on the performance of commercial banks in Ethiopia and would be utmost relevant to address how credit risk affects banks profitability and the findings will serve as the basis for possible recommendations and provide policy measures to the various stakeholders to tackle the effect of credit risk in order to enhance the quality of banks' risk assets.

From this study the banking industry able to identify specific and effective practices to diversify credit risk in their asset portfolio to minimize the risks involved by using credit risk management

tools and techniques like diversification, using collateral, screening and monitoring. It also serves as a reference material for anyone who will undertake a further study on related topic.

1.6. Scope of the study

The study specifically focused on the effect of credit risk management on the performance of commercial banks in Ethiopia. Currently there are 18 commercial banks operating in Ethiopia. Out of these commercial banks, eight were selected based on their establishment year and ownership, which is one from government owned and the others from private owned. The study specifically focused on credit operation of the selected banks which is mainly conducted in their central head office.

1.7 Limitation of the study

The study has some limitations. The first is the purposively selected sample size considered in this study. The sample size is limited but taking more may give deep understanding on the effect of credit risk management on the performance of commercial banks. Nevertheless, this research is still valid having analyzed the available sample size with the regression analysis the time required to complete the research was very small and this had an influence on the researchers' decision to take small number of sample size. So the sample size may not represent all eighteen commercial banks in Ethiopia.

1.8. Organization of the paper

This paper contains five chapters. Chapter one includes background of the study, statement of the problem, research questions, objective of the study, significance of the study, and scope and limitation of the study. In chapter two related literature review /various theoretical and empirical studies were discuss/ in chapter three research design, target population and sampling, data collection technique ,source of data and analysis methods are included. Chapter four presents data analysis and interpretation and reports the result from the collected data. Finally in chapter five conclusions were made based on the findings obtained in chapter four and recommendations were made.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1. Introduction

In this chapter, the researcher will review different books, journals and others related to the concept of credit risk, credit risk management process, techniques and its effect on performance of banks. This chapter discusses theoretical review and empirical review. The theoretical review highlighted the theories related to this study while the empirical review looked at literature derived from various research works by other researchers on this topic.

2.2. Theoretical and Conceptual Review

2.2.1. Risk

“Risk is the variability of the actual return from the expected returns associated with a given asset or investment “(Khan and Jain, 2004) Earnhardt and Brigham (2011) also defined risk as “the chance that some unfavorable event (both financial and physical) will occur”. Asare Bake (2010) stated that risk associated with the business of banking can be grouped in to credit risk, market risk which consists of foreign exchange risk , liquidity risk and interest rate risk , operational risk which sometimes includes legal risk and strategic risk.

2.2.2. Types of bank risk

The core business of banking industry is to mobilize deposit for reselling or investment purpose. Banks need to take to maintain their margin and fulfill their role in the economy. But taking excessive risk is likely to run in to difficulty and eventually fail to fulfill its obligations and becomes insolvent (Gustel and Baesen, 2009). According to Crouhy, Galai and Mark (2009) in the global banking industry there are three broad risk types.

Market risk; these are risks arising from changes in market factors like interest rates, exchange rates and commodity price factors.

Operational risk; this is the risk as a result of potential operational breakdowns in terms of people risk, process risks and technology risks. For instance frauds, inadequate computer systems, control failures, operation failures or natural disasters.

Credit risk; is the biggest risk in financial market following a change in the factors that derive the credit quality of an asset. Some of these are adverse effects arising from credit grade migration, the dynamics of recovery rate and default .this are major risks that banks face there are also other risk that are not mentioned here.

2.2.3. Credit risk

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 is the possibility of losing the outstanding loan partially or totally due to credit events (default risk) Basel committee on banking supervision (2001).) It can also define as the potential that a bank borrower or counterparty will fail to meet its obligation in accordance with agreed terms. Credit risk also referred to as default risk, performance risk, or counterparty risk (Brown and Moles, 2012).

A bank exists not only to accept deposit but also to grant credit facilities, therefore inevitably exposed to credit risk. Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to great extent than any other risks (Gieseche, 2004).Credit risk is the degree of value fluctuations in debt instruments and derivatives due to changes in the underlying credit quality of borrowers and counterparties (Chen and Pan, 2012

Bessie (2002) opened that credit risk is critical since the default of a small number of important customers can generate large losses which can lead to insolvency. Coyle (2000) defines credit risk as losses from the refusal or inability of credit customers to pay what is owed in full and on time. Credit risk is the exposure faced by banks when a borrower (customer) defaults in honoring debt obligations on due date or at maturity. This risk interchangeably called counterparty risk is capable of putting the bank in distress if not adequately managed.

Credit risk management maximizes bank's risk adjusted rate of return by maintaining credit risk exposure within acceptable limit In order to provide framework for understanding the effect of credit risk management on banks' profitability (Kargi, 2011).

Credit risk is the probability that some of banks asset's especially its loans will decline In value and possibility become worthless. Since banks hold little owners capital relative to the aggregate

value of their assets only a small percentage of total loans need to go bad to push a bank to the brink of failure. Thus management of credit risk is very important and central to the health of a bank and indeed the entire financial system.

As banks make loans, they need to make provisions for loan losses in their books. The higher this provision becomes relative to the size of total loans, the riskier the bank becomes. An increase in the value the provision for loan losses relative to total loans is an indication that the bank's assets are becoming more difficult to collect (Throe, Aboagy and Koyerhoah Coleman 2011)

Credit risk and banks performance has been the concern of emerging studies both in developed and developing countries. Abo(2005) stated that risk management has received extensive attention from both the corporate world as well as the academia. The credit creation process works efficiently when funds are transferred from decisive savers to borrower (Bernanke 1993) there are many possible potential sources of risk as advanced in the study of Campbell (2007), includes interest rate risk, liquidity risk, Credit risk, market risk, foreign exchange risk and political risk.

The main source of credit risk include, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels , direct lending, massive licensing of banks, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank (kithinji,2010).

Credit risk is critical since the default of a small number of important customers can case large loses which can lead to insolvency (Basis, 2002). Poor asset quality is perceived to cause capital erosion and increase credit and capital risks (Hassan and Bashir, 2004)

Credit risk is a serious threat to the performance of banks; therefore various researchers have examined the effect of credit risk on banks in varying dimensions. Kargi (2011) evaluated the effect of credit risk on the profitability of Nigerian banks. Financial ratios as measures of bank performance and credit risk were collected from the annual reports and accounts of sampled banks from 2004-2008 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management has significant effect on the profitability of

Nigerian banks. The study concluded that banks profitability is inversely influenced by the level of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress.

2.2.4. Managing credit risk

Management efficiency is one of the key internal factors that determine the bank profitability. It is represented by different financial ratios like total asset growth, loan growth rate and earnings growth rate. The performance of management is often expressed alliteratively through subjective evaluation of management systems, organizational discipline, control systems, quality of staff and others. The capability of the management to deploy its resources efficiently, income maximization, reducing operating costs, can be measured by financial ratios. One of this ratios used to measure management quality is operating profit to income ratio. One of this ratios used to measure management quality is operating profit to income ratio (Rahman et al, 2009; Ssngmi and Nazir, 2010).

2.2.5. Credit risk measurement framework

Credit risk is conventionally defined using the concept of expected loss (EL) and unexpected loss (UL). Because expected losses can be anticipated, they should be regarded as a cost of doing business and not as a financial risk. Obviously credit losses are not constant across the economic cycle, there being substantial volatility (unexpected loss) about the level of expected loss. It is this volatility that credit portfolio models are designed to quantify volatility of portfolio losses is derived by two factors; concentration and correlation.

2.2.6. Credit assessment and risk grading

2.2.6.1. Credit assessment

Credit and risk assessment should be conducted prior to the granting of loans and at least annually thereafter for all facilities. The results of this assessment should be presented in accreditation application that originates from the relationship manager/account officer (RM) and is approved by credit risk management (CRM). The RM should be the owner of customer relationship, and must be held responsible to insure the accuracy of the entire credit application submitted for approval. RMs must be familiar with the bank's lending guidelines and should conduct due diligence on new borrowers, principals, and guarantors to ensure such parties are in fact who they represent themselves to be. All banks should have established know your customer (KYC)

and money laundering guidelines which should be adhered to at all times. Credit applications should summaries the results of the RMS risk assessment and at least should include the following details;

- Amount and type of loan approved
- Purpose of loans
- Loan structure (tenor, covenants, repayment schedules interest)
- Security arrangements

2.2.6.2. Risk grading

All banks should adopt a credit risk grading system. The system should define the risk profile of borrower's to ensure that account management structure and pricing are commensurate with the risk involved. RISK grading is a key measurement of a bank's asset quality and as such it is essential that grading is a robust process. All facilities should be assigned a risk grade. Where deterioration in risk is noted, the risk grades should be clearly stated on credit applications.

The more conservative risk grade (higher) should be applied if there is a difference between the personal judgment and the risk grade scorecard results. It is recognized that the banks may have more or less risk grades, however monitoring standards and account management must be appropriate given the assigned risk grade.

2.2.7. Bank risk management system

The banking industry has long viewed the problem of risk management as the need to control four of the above risks which make up most, if not all of their risk exposure, credit interest rate, foreign exchange and liquidity risk. While they recognize counterparty and legal risks, they view them as less central to their concerns. Where counterparty risk is significant, it is evaluated using standard credit risk procedures and often with in the credit department itself. Most bankers would view legal risks as arising from their credit decisions or more likely proper process not employed in financial contracting.

Accordingly the study of bank risk management process is essentially an investigation of how they manage these four risks. In each case the procedure outlined above is adapted to the risk considered so as to standardize, measure, constrain and manage each of these risks

2.2.8. Credit portfolio management

Modern credit risk management techniques were initiated by the banking industry's desire to avoid a repeat of its late 1980s and early 1990s default experience. The heavy credit losses during this period, driven by a poorly controlled rush to build market share at the expense of asset quality and portfolio diversification threatened the solvency of even well capitalized institutions.

The need to better understand portfolio credit risks was reinforced by the application of the bank for international settlements' (BIS) capital adequacy guidelines in 1988. These guidelines whilst specifying minimum regulatory capital requirements were inadequate to provide an accurate measure of the risk/reward characteristics of a credit portfolio. Banks therefore started to develop more sophisticated credit risk management techniques that recognized both the credit risk of individual exposures and the degree to which these risks were diversified.

Banks leading the development of credit risk management techniques quickly discovered that credit pricing was highly inefficient. Typically pricing within a loan portfolio would be almost flat across the credit risk spectrum, generating huge skews in customer profitability. Initial efforts focused on mitigating these skews by calculating risk adjusted profitability e.g. risk adjusted return on capital by su portfolio and then using these measures to credit risk adjusted loan pricing tools. Leading banks thus started to rationalize pricing in both loan and bond portfolios and moving underperforming assets off their balance sheets. Consequently banks that had not developed risk-adjusted performance measures started to suffer from negative selection often accepting significantly underpriced assets from more sophisticated institutions. In parallel to developing aggregate risk adjusted performance measures, leading banks were also starting to quantify credit risk at finer levels of detail. Credit portfolio models were developed which could differentiate credit risk along multiple dimensions (credit grade, industry, country/region etc.) and fore large corporate exposures, on a name by name basis. These credit portfolio models have positioned leading institutions to take advantages of the increasing liquidity of credit markets and to adopt a far more active approach to credit portfolio management than was previously possible. Historically credit portfolio management had focused on the monitoring of exposure by broad portfolio segments and if necessary the imposition of exposure caps. The creation of a stand – alone credit portfolio management function armed with sophisticated portfolio models and with

controlling mandate over assets held on the balance sheet, now enabled the credit portfolio to be optimized independent of origination activity. Active credit portfolio optimization has enormous potential to enhance profitability

2.2.9. Determinants of financial performance in commercial banks

Determinants of bank performance have attracted the interest of academic research as well as of banks management financial markets and bank supervisors since the knowledge of the internal and external determinants of banks' profits and margins is essential for various parties.

Chirwa(2001) defined financial performance as the operational strength of a firm in relation to its revenue and expenditure as revealed by its financial statements. The financial performance of banks is expressed in terms of profitability. Profitability is a company's ability to earn a reasonable profit on the owner's investment, warren E Buffett, (2005)

Profitability accounts for the effect of better financial soundness on bank risk bearing capacity and on their ability to perform liquidity transformation (Rauch et al 2008;Shen et al,2010). According to Popa et al. (2009), popular measures of bank performances are return on asset (ROA), return on equity (ROE), net banking income and the efficiency ratio.

The determinants of banks performance can be classified in to banc specific (internal) and macroeconomic (external) factors. These are stochastic variables that determine the output. Internal factors are individual bank characteristics which affect the banks performance. These factors are basically influenced by internal decisions of management and the board. The external factors are sector-wide or country –wide factors which are beyond the control of the company and affect the profitability of banks.

2.2.9.1. Internal determinants

Most researchers measured performance using either return on asset (ROA)or return on equity (ROE). The major studies dealing with micro-specific factors employ variables such as size, risk, capital adequacy and operational efficiency and test the relationship with either return on asset (ROA) or return on equity (ROE).

2.2.9.2. External determinants

Turning to the external determinants, several factors have been suggested as effecting on profitability and these factors can further distinguish between control variables that describe the

macroeconomic environment such as inflation, interest rate and cyclical output and variables that represent market characteristics. The latter refer to market concentration, industry size and ownership status.

Market risk is the risk of asset value change associated with systematic factor. According to Santomero (1997), market risk by its nature can be hedge but cannot be diversified away completely. Two market risks that are of concern to the banking sector are interest rates and relative value of currencies. The banking operation is solely dependent on these as it effects on performance. For instance most banks track interest rate risk closely. They measure and manage the firm's vulnerability to interest rate variation as well. Liquidity risk, according to santomero (1997), can be described as the risk of funding crisis such as unexpected event in the form of large charge off, loss of confidence or a crisis of national proportion like existence crisis. Risk management here centers on liquidity facilities and portfolio structure. Recognizing liquidity risk leads the banks to recognize liquidity itself as an asset and portfolio design in the face of illiquidity concerns as a challenge.

2.2.10. Relationship between credit risk management and bank performance

According to different researchers and authors credit risk is the most significant of all risks in terms of size of potential losses. As the extension of credit has always been at the core of banking operation, the focus of bank risk management has been credit risk management. When banks manage their risk better, they will get advantage to increase their performance (return). Better risk management indicates that banks operate their activities at lower relative risk and at lower conflict of interests between parties. (Anthony M. Santomero , 1997)

The advantages of implementing better risk management lead to better banks performance. Better bank performance increases their reputation and image from public or market point of view. Banks also get more opportunities to increase the productive assets leading to higher bank profitability, liquidity and solvency. (Tandelilin, kaarro, Mahadwattha, Supriyata, 2007). Therefore effective credit risk management should be a critical component of a bank's overall risk management strategy and is essential to the long-term success of any banking organization. It becomes more and more significant in order to ensure sustainable profit in banks.

2.3. Review of empirical studies

There are various researches made on the effect of credit risk management on the performance of commercial banks, and how could the effective credit risk management assist in reducing the possibility of failure and restricting the uncertainty of achieving the required financial performance. Most of these researches support the notion that there is a positive relationship between effective credit risk management and banks profitability and some of these studies support the notion that there is negative relationship between them.

A study by (Hakim and Neaime , 2001) tried to examine the effect of liquidity, credit and capital on bank performance in the banks of Egypt and Lebanon; they found that there was a sound risk management actions and application of these banks rules and laws. Also (Manzura and Juanjuan, 2009) found that Non-performing loans indicator affected on profitability as measured by ROE more than capital adequacy ratio and the effect of credit risk management on profitability was not the same for all the banks included in their study.

A study conducted by (Olausi, 2014) with the title of effect of credit risk management found risk-weighted asset is significantly and positively related to credit risk measured by non-performing loans (NPL) to total loans. They rationalized that relatively risky loan portfolio will result in higher NPLs. that provision of loan losses (PLL) to be positive and significantly associated with NPL. Hence, a higher PLL indicates an increase in risk and deterioration in loan quality.

A study conducted by Grace (2012) showed that there is a significant relationship between financial performance and commercial banks performance in Nigeria which is made with the objective to investigate the effect of credit risk management on the performance of commercial banks in Nigeria. In the model return on equity (ROE) and return on asset (ROA) were used as performance indicators while Non-performing loans (NPL) and capital adequacy ratio (CAR) as credit risk management indicators. The results of the analysis states that both non-performing loan and capital adequacy ratio have negative and relatively significant effect on return on equity (ROE).

A research conducted by (Magnifique , 2013) studied the effect of credit risk management and financial performance of commercial banks in Rwanda. The study focused on credit risk

identification, credit risk analysis and assessment, credit scoring mechanism and risk monitoring affect financial performance of commercial banks in Rwanda. The overall finding and conclusion of the study was that all the measures of credit risk management used in this study are highly significant predictors of financial performance of commercial banks in Rwanda except risk monitoring.

Ahmed and Ariff (2007) examined key determinants of credit risk of commercial banks on emerging economy banking systems compared with the developed economies. The study found that regulation is important for banking systems that offer multi-products and services; management quality is critical in the case of loan dominant banks in emerging economies. An increase in loan loss provision is also considered to be a significant determinant of potential credit risk. The study further highlighted that credit risk in emerging economy banks is higher than that of in developed economies.

A study conducted by(Onaolapo, 2012) analyze credit risk management efficiency in Nigerian commercial banks from 2004- 2009 provides some further insight in to credit risk as profit enhancing mechanism. This is by using regression analysis and found rather an interesting result that there is a minimal causation between deposit exposure and banks performance.

A research conducted by Ara Hodna et al in year 2009 with the title of credit risk and profitability in commercial banks in Sweden tried to find out how the credit risk management affects the profitability of banks. The main purpose of the study was to describe the effect level of credit risk management on profitability in four commercial banks in Sweden. In the model it was defined ROE as profitability indicator while NPLR and CAR as credit risk management indicators. The quantitative was used in order to fulfill the main purpose of the study. Another study by (Dasah and agyei, 2012) used regression analysis to determine whether there is a significant relationship between credit risk and profitability of Ghanaian banks. They followed the line of (Hosna, Manzura and Juanjuan , 2009) by using return on equity as a measure of bank's performance and a ratio of non-performing loans to total asset as proxy for credit risk management. They found empirically that there is an effect of credit risk management on profitability level of Ghanaian banks. The study also suggests that higher capital requirement contributes positively to bank's profitability.

A research conducted by (Kolapo, Ayeni and Ojo 2012) using panel data regression for the period 2000 to 2010 found that the effect of credit risk on bank's performance measured by return on asset (ROA) of banks is cross-sectional invariant. They concluded that the nature and managerial pattern of individual firms do not determine the effect.

Felix and Claudine (2008) shows that return on equity ROE and return on asset ROA all indicating profitability were negatively related to the ratio of non-performing loan to total loan (NPL/TL) of banks therefore decreases profitability.

Achou and Tenguh (2008) show that there is a significant relationship between bank performance (in terms of return on asset) and credit risk management (in terms of loan performance). Better credit risk management results in better bank performance. Thus, it is of crucial importance that banks practice prudent risk management and safeguarding the assets of the banks and protect the investors' interest.

Credit risk is a serious threat to the performance of banks; therefore various researchers have examined the effect of credit risk on banks in varying dimensions. Kargi (2011) evaluated the effect of credit risk on the profitability Nigerian commercial banks. Financial ratios as a measure bank performance and credit risk were collected from the annual reports and accounts of sampled banks from 2004-2008 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management has a significant effect on the profitability of Nigerian commercial banks. The study concluded that banks' profitability is inversely influenced by the level of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress.

Epure and Lafuente (2012) examined bank performance in the presence of risk for Costa-Rican banking industry during 1998-2007. The result showed that performance improvements follow regulatory changes and that risk explains differences in banks and non-performing loans negatively affect efficiency and return on assets while the capital adequacy ratio has positive effect on the net interest margin.

Kithinji (2010) assessed the effect of credit risk management on the profitability of commercial banks in Kenya. Data on the amount of credit level of non-performing loans and profits were collected for the period 2004-2008. The findings revealed that the bulk of the profits of

commercial banks are not influenced by the amount of credit and non-performing loan, therefore suggests that other variables other than credit and non-performing loans effect on profit.

Felix and Claudine (2008) investigated the relationship between bank performance and credit risk management. Based on their findings that return on equity (ROE) and return on asset (ROA) both as a measure of profitability were inversely related to the ratio of non-performing loan to total loan of commercial banks thereby leading to a decline in profitability

Al-khouri (2011) assessed the effect of bank's specific risk characteristics and overall banking environment on the performance of forty three commercial banks operating in 6 of the Gulf cooperation council (GCC) countries over the period 1998- 2008. Using fixed effect regression analysis, results showed that credit risk, liquidity risk and capital risk are the major factors that affect bank performance when profitability is measured by return on asset while the only risk that affects profitability when measured by return on equity is liquidity risk.

Ben-Naceur and Omran (2008) try to examine the influence of bank regulation the influence of bank regulations, concentration, financial and institutional development on commercial banks' margin and profitability in Middle East and North Africa (MENA) countries from 1989- 2005 found that bank capitalization and credit risk have positive and significant effect on banks net interest margin, cost efficiency and profitability.

Charles, Okaro Kenneth (2013) examined the effect of credit risk on management on capital adequacy and banks financial performance in Nigeria. For this purpose six banks were selected by using positive sampling technique. Data were obtain from the published financial statements from 2004 to 2009 .panel data model was used to estimate the relationship that exists among loan loss provisions (LLP), loans and advances (LA), Non-performing loans (NPL), capital adequacy (CA) and return on assets (ROA).Results showed that sound credit risk management and capital adequacy related positively on banks financial performance with the exception of loans and advances which was found to have negative effect on banks profitability in the period under studied.

Fernando and Nimal (2013) examined the effect of overall risk management on Sri Lankan banks' performance. With the objective to identify the effect of risk management on efficiency in

Sri Lankan banks. This study adopted second stage data development analysis based on the data for the period from 2005 to 2011 of licensed domestic commercial banks in Sri Lanka.

Ayadi and Boujelbene (2012) in their banking performance study of 12 Tunisian deposit banks over the period of 1995-2005 notice a significant positive relationship between size and return on average asset proving the existence of economies of scale in the Tunisian banking sector. Contrarily Ben Naceur and Goaid (2010) show that size effect negatively on profitability which involves that Tunisian banks operating above their optimum level.

Regarding operating efficiency, Ali akhtar and Sadaqat (2011) found a negative insignificant relationship with credit risk of Pakistan commercial banks. Inefficient managers will not cope successfully with the process of granting and monitoring loans that will lower the banks credit quality and bring about a growth in problem loans (Salasa and Saurina, 2002). Inefficient banks hold riskier portfolio (Lis, pages and Saurina, 2000). As studied by Berger and De Young (1997), poor management in the banking institutions results in bad quality of loans and therefore escalates the level of non-performing loans. They argue that bad management of the banking firms will result in banks inefficiency affects the process of granting loans. The banks management might not thoroughly evaluate their customer's credit application due to their poor evaluation skills. Therefore banks inefficiencies might lead to high non-performing loan.

The literature on regulatory capital and bank credit risk shows an inverse relationship. For instance Husain and Hassan (2004) in the context of 11 developing countries have shown a negative relationship between capital ratio and portfolio risk Nor and Mohamed (2007) have presented a comparative study of all factors contributing to the credit risks of commercial banks in a multi country setting Australia, France, Japan and U.S. represent developed economy banking systems while India, Korea, Malaysia, Mexico and Thailand represents developing economy. They found have found that the regulatory capital is an important factor influencing the credit risk of any banking system that offers a range of services. This study also highlights that the credit risk in the emerging economy banks is higher than that in developed economies and that risk is formed by a large number of bank specific factors in emerging economies compared to their counterparts in developed economies. In the context of emerging countries, Goldlewski (2004) have found that regulation of capital and risk are negatively related.

Local studies such as Tefera (2011) and Mekasha (2011) studied the effect of credit risk management on the performance of commercial banks in Ethiopia. Both of them used secondary data from annual reports of commercial banks and survey of primary data from bank managers and officers which similarly showed that there is a negative relationship between credit risk and performance of commercial banks in Ethiopia. On the contrary, the research conducted by Million (2014) shows the significant positive relationship between loan loss provision and performance of commercial banks this study might indicate the presence of potential earning management activities by bank managers. Mekasha (20011) investigated credit risk management and its effect on the performance of Ethiopian commercial banks. The researcher used 10 years panel data from the selected commercial banks for the study, to examine the relationship between return on asset and loan provision, none-performing loans and total assets. The study revealed that there is a significant relationship between bank performance and credit risk management.

2.4. Summary and Literature Gap

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 the above theoretical as well as empirical review, credit risk is affecting the performance of the Banking industry. Correspondingly, in the literature; the Bank profitability is usually expressed as a function of internal and external determinants. Various studies have been made in different countries regarding these variables. Among others, the most important internal determinants that are affecting performance include Bank Size (Age), Provision to Total Loans, Cost per Loan and Loan to Total Asset.

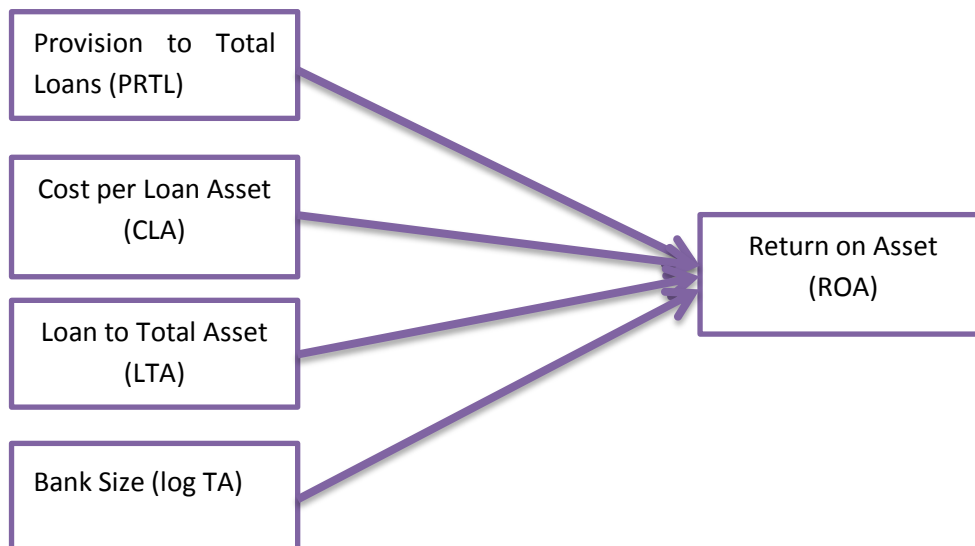
The studies made shows consistent results with respect to loan to total asset, Provision to Total Loans, however the empirical results for cost per loan and Bank size (Age) were mixed. Looking into the analysis of the audited financial statements for the banks for the past consecutive five years (2013-2017) depicts that, the provision to loan of the banks is above 1% which should have been the case had the entire loan and advances were under normal status i.e in alignment of the repayment modality. The maximum was 34.5% in 2016 which is even higher than National Bank tolerable limit of 5% and the lower being 2.4% in 2012. The loan to total asset has shown a decrease from 2008 to 2011 which shows a negative implication as it is one of the major source of revenue for the banking industry. Contrary however Cost per loan asset has increased.

Thus the research tried to examine the impact of credit risk on the profitability of Ethiopian commercial Banks and identifies the relationships between the Loan Loss Provision, Loan and Advance to Total Asset, Cost per Loan and Bank Size with Banks Profitability. The research fills the gaps below that exist in the country; Academic (Literature) gap, the studies made in the Ethiopia so far do not consider variables like Age or Size, Cost per Loan Asset in relation to performance of the banks which however were done well in different countries. Therefore the research serves as additional complement as reflecting the local banking industry context. As the research is applied, it is further believed that such a study with recognition of these variables would contribute to policy making and devise risk mitigating mechanisms.

2.5. Conceptual Framework

By identifying the basic variables on the research subject and creating a relationship between them through theoretical and empirical literature background, conceptual framework and model of this study was designed. In the conceptual model of research, among others, the most important internal determinants that are affecting performance include Bank Size (Age), Provision to Total Loans, Cost per Loan and Loan to Total Asset. The studies made shows consistent results with respect to loan to total asset, Provision to Total Loans. The conceptual framework of this research is provided in the figure (1) below.

Figure 1 Conceptual framework of the study



Source: Compiled by the researcher from the theoretical (conceptual) literature review

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Introduction

This chapter demonstrates various stages that will be followed in completing the study. The procedures and techniques that will be used in the collection, processing and analysis of data are highlighted.

3.2. Research Design

The study fundamentally uses explanatory research design. That involves assessing the effect of selected independent variables on return on asset (ROA) or on the performance of the banking sector. Quantitative approach was adopted to form a causal link among different variables with bank performance measures. Quantitative approach uses statistical methods in describing patterns of behavior and generalizing findings. This was to empirically examine the quantitative effect of credit risk on the performance of commercial banks in Ethiopia for a period of five years. The data collected were analyzed using descriptive statistics was for trend analysis and to identify outliers.

3.3. Research approach

A quantitative approach is adopted to form a causal link among different variables with bank performance measures. The data collected in the study were analyzed using descriptive statistics. The main reason for the use of descriptive method of analysis is to describe the characteristics of the study related to effect of credit risk management on the selected banks. Graphs and tables were used to elaborate the results in detail. Eight Banks were chosen from the nineteen existing commercial Banks. Data are sourced from the Annual Reports of the Banks in the sample.

3.3. Target population

The target populations of the study are all eighteen commercial banks operating in Ethiopia. Among which seventeen are private banks and one is government owned.

3.4. Sample size and Sampling technique

The objective of the study is to empirically examine the quantitative effect of credit risk on the performance of commercial Banks in Ethiopia over the period of 5 years (2013-2017) this is to see the short term effect of the variables for the latest period which is more favorable for

private banks to avoid time bias. A non- probability in the form of judgmental sampling technique is employed in selecting Banks into the sample.

Out of the eighteen Commercial Banks operating in the country seventeen are private and one is government Bank (CBE). As per NBE classification the private banks are divided as peer 1, peer 2 and peer 3 based on their time of entry. Peer 1 consists (AIB, DB, BOA, WB, UB, and NIB), peer 2 consists (CBO, LIB, ZB, OIB, BBI, and BIB) and peer 3 consists (AB, ADIB, DGB, and EB). Out of eighteen, eight Banks were selected, four from peer one (UB, NIB, WB and BOA) and two from peer two (CBO and OIB), two bank from peer three (AB) and commercial Bank of Ethiopia (CBE) on purposive method.

Eight banks namely Commercial Bank of Ethiopia and Abyssinia, Oromia, United, Wegagen, Abay, Cooperative bank of Oromia, and Nib bank are chosen from eighteen commercial banks by their establishment year and with both the composition of private and government banks. The study was take central head office this is because most of the credit request of the sample banks was processed in the central head office.

3.5. Source of data and collection techniques

The study is based on secondary data obtained from published statements of accounts of the commercial Banks in Ethiopia. The published accounts mainly of the balance sheet and income statements of Commercial Banks for the period 2013-2017 are used. In addition, the various annual and quarterly publications of the NBE , publications (including the annual report) of the Central Statistical Authority of Ethiopia (CSA), Ministry of Finance and Economic Development (MoFED), Ethiopian Economic Association (EEA-Ethiopia) were consulted. Also, references with regard to the existing commercial code of the country, Banking proclamations, various directives of the NBE were made.

3.6. Definition of variables and a priori assumption

- **Dependent variable**

Return on asset (ROA), it is a ratio that measures company earnings before interest & taxes (EBIT) against its total assets. The ratio is considered an indicator of how efficient a company is in using its assets to generate before contractual obligation must be paid. It is calculated as: $ROA = EBIT / \text{Total Assets}$ (Kanneth & Charles (2013)).

- **Independent variable**

Provision to Total Loans (PRTL) – is proxy measure for default rate. Default rate (DR) is usually computed, the term for a practice in the financial services industry for a particular lender to change the terms of payment schedule, as a Non Performing Loans/ Total loans. However, due to the unavailability of data related to NPLs, a proxy measure is used.

Cost per Loan Asset (CLA) - is the average cost per loan advanced to customer in monetary term. Purpose of this is to indicate efficiency in distributing loans to customers. CLA ratio can be calculated as CLA Ratio = Total Operating Cost/ Total amount of loans.

Loan to Total Asset (LTA) - measures the exposure level of the Bank to credit risk. Banks with higher loan to total asset ratio have high exposure to credit risk. Brewer (1989) and Altunbas (2005).

Bank Size (log TA) - measures the size of the Bank in terms of its asset position. Large Banks are expected to have low credit risk that emanate from their capacity to establish sound credit risk management framework.

3.7. Model specification

A multiple linear regression model was used to test the relationship between bank profitability and the internal determinants. Multiple linear regression models were used to test the relationship between the dependent variable and independent variables. The linear equation relating performance measures to the independent variables is as shown below:

$$ROA = B_0 + B_1 PRTL + B_2 LTA + B_3 CLA + B_4 \log TA$$

ROA= Return on Asset

PRTL = Provision to Total Loans

CLA= Cost per Loan Asset

LTA = Loan to Total Asset

log TA= Bank Size (natural logarithm of total assets)

B₀= Constant term

B₁, B₂ ... are coefficient of determinants

3.8. Method of data analysis

According to Creswell (2009) data analysis as a process which involves drawing conclusions and explaining findings in words about a study. The data collected from secondary sources is presented using tables and graphs. Secondary data is analyzed using trend analysis to show to what extent banks are exposed to credit risk. To analyze, interpret and summarize the data, the researcher has also used descriptive and inferential statistics.

Descriptive statistics is used to show the trends of Banks Return on Asset with the help of graphs. The inferential statistics used to make inference based on the findings regarding the effect and relationship between Return on Asset and Bank's the different variables indicated above. This is done by establishing a regression model. This study used an ordinary least squares (OLS) regression to estimate the linear equation. The rational for choosing OLS is that, if the Classical Linear Regression Model (CLRM) assumptions hold true, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators (Brooks, 2008). In addition, as noted in Petra (2007) OLS outperforms the other estimation methods when the following holds; the cross section is small and the time dimension is short. Therefore, as far as both the above facts hold true in this study it is rational to use OLS.

3.9. Validity and Reliability of Data

Reliability of data concerns its consistency. Thus, reliability refers to the extent to which the data is the same irrespective of their source. That is, the data specifically, the annual reports and publications of Commercial Bank of Ethiopia were check to find variance with each other that will support the reliability of the data. This study, however, is threatened by the fact that the data used was mainly from secondary sources and therefore any error from that data collection process will definitely affect the outcome. The methodology used for this study was selected because of its suitability in its dependence on certified information from recognized institutions other than subjective opinions, which would have been associated with primary sources. The F test and the coefficient of determination were used to test the validity and reliability of the relationship established by the regression analysis. Sourced from banks financial statement for the period of five years (2013-2017).

CHAPTER FOUR

4. DATA ANALYSIS AND DISCUSSION

4.1. Introduction

This chapter is organized in a way to answer the research questions. First, trend and descriptive statistics is performed. Second CLRM assumption test were made. At the end the result of the regression model presents how the independent variables affect the dependent variable and finally the result of the model will be discussed in line with the empirical results.

4.2. Descriptive statistics

Table 4.1 Descriptive statistics

. summarize ROA PRTL CLA LTA logTA

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	40	.0326656	.0115569	.0000298	.0647418
PRTL	40	.0602121	.0494996	.0003534	.3483957
CLA	40	.1631038	.2070608	.0708493	1.122181
LTA	40	.4437786	.1138519	.0003149	.7002801
logTA	40	23.53079	2.062253	20.93676	33.82445

Source; Author's Computation (STATA 14.0)

Return on Asset is an indicator of how efficient a company is using its assets to generate before contractual obligation must be paid. The mean value ROA is 3.26% which is more than the international standard of ROA of 1 to 2%, Basel Committee on Banking Supervision (2001) .The standard deviation the earnings before interest and taxes (EBIT) against total asset ratio from its mean for Commercial Banks in Ethiopia is 0.11% . The variation values of ROA are .0115569%.

The provision to total loan, which is a proxy measure of the default rate of the banks mean value of the percentage of the provision to the total loans and advances to customers, is 0.60% with the

variation value of .0494996 %. This is a bit higher than the provision required for outstanding loans had all loans been in pass status and is closer to the provision required for loans under special mention status (3%) as per the directives of the NBE (SBB 43/2008). Thus there is problem in loan quality and hence high credit risk level persists in the Commercial Banks.

Cost per loan asset measures the cost per loan advanced to customer in monetary term and the function of this is to point out efficiency in distributing loans to customers. The mean percentage for CLA is .16% with .20% variations which is not that significant.

The other variable is the Loan to total asset (LTA) which measures the level of exposure of the banks to credit risk. Bank loans are expected to be the main source of income and are expected to have a positive effect on bank performance. Other things constant, the more deposits are transformed into loans, the higher the interest margin and profits. However, if a bank needs to increase risk to have a higher loan-to-asset ratio, then profits may decrease. The mean value of loan to total asset is 0.4437786% with the variation value of 0.1138519% respectively. It can be said that the variation from the mean is high which indicates that the commercial banks are not transferring the deposits into loan. It also provides indication of the excessive liquidity status of the Ethiopian Banks. However, the current government regulation which forced the banks to purchase bond has strained their capacity to extend loan as they wish but to put it almost in a zero risk investment.

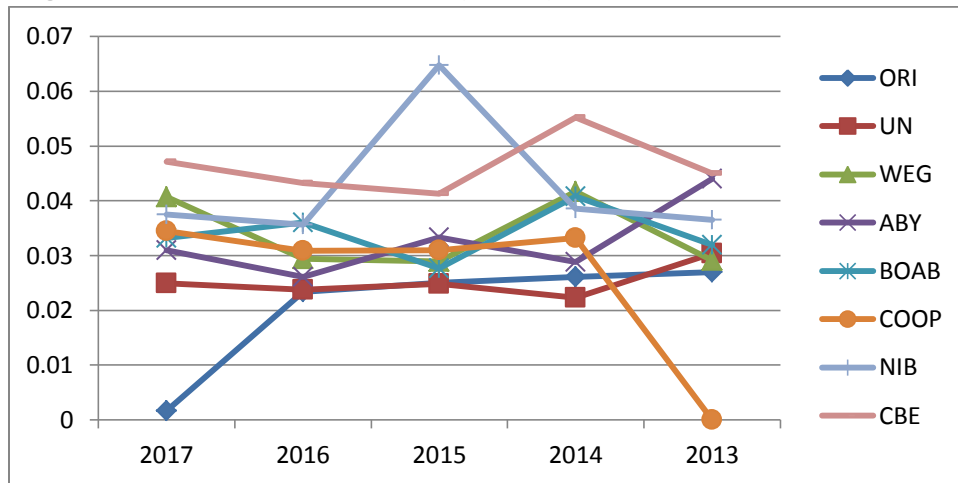
The remaining variable is the size of the bank which is included as an independent variable to account for size related economies and diseconomies of scale. In most of the finance literature, the total assets of the banks are used as a proxy for bank size. Since the other dependent variable in the model, ROA, is deflated by total assets it is the log to total assets that is used in the model. The mean value of log TA is 23.53% with variation value of 2.06% respectively.

4.3. Trend statistics

Return on assets (ROA)

The ROA shows, decreasing trend since 2013 to 2017, but intermittent growth between the year 2015 and 2017,

Figure 4.1 Return on assets (ROA)

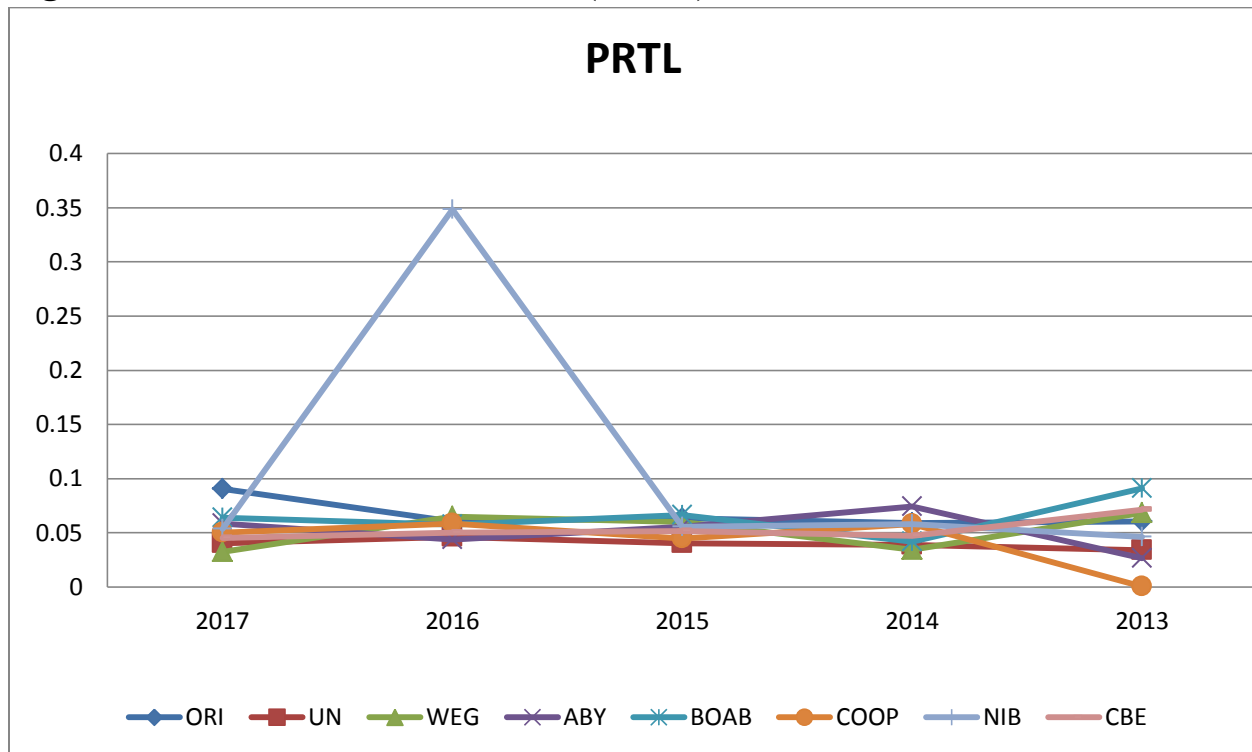


Source; Author's Computation (Excel)

Provision for Total Loan (PRTL)

Provisions to total loans fluctuation depicted in the graph between 0.000353 and 0.090336 in the year 2013 to 2017 respectively. And almost the graph is linear. . The decrease in provision, though it is above the 1% requirement and still a lot to do, is an indication that credit risk level is also reducing. However, Provisions to total loans in the year 2016 registered the higher score, which is 0.348396.

Figure 4.2 Provision for Total Loan (PRTL)

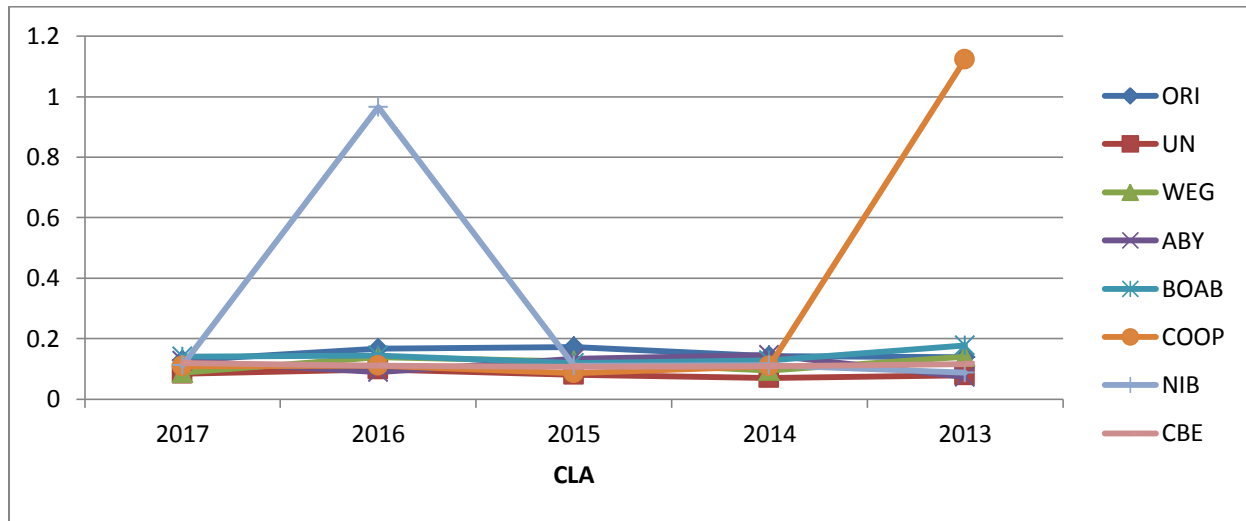


Source; Author's Computation (Excel)

Cost Per Loan Asset (CLA)

There is a decrease in cost per loan asset from year 2013 to 2017, which has reached its lowest point of .129 in the year 2017. Thus, banks need to further improve their efficiency in terms of distributing cost to the customers.

Figure 4.3 Cost per Loan Asset (CLA)

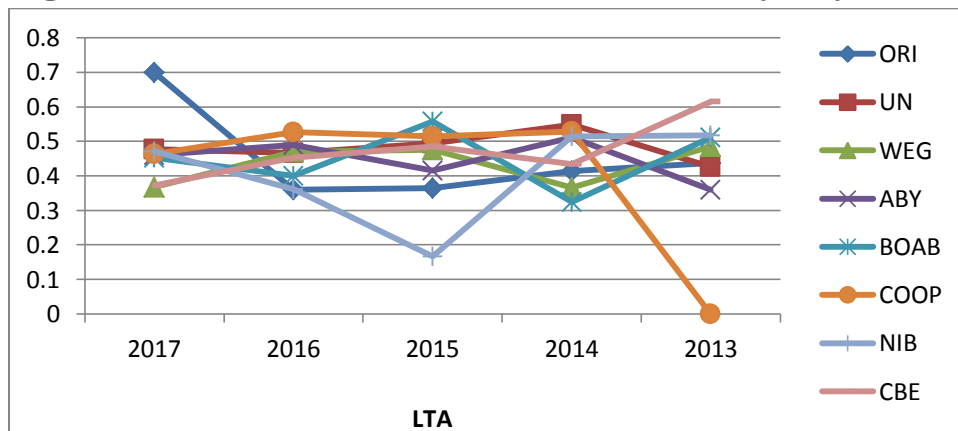


Source; Author's Computation (Excel)

Loan and Advance to Total Asset (LTA)

The proportion of Loan to Total asset is increased from the year in the year 2017 and the graph is linear. This is partly because of the effect of the policy framework which require the purchase of government bond upon disbursement of a new loan to customer which is indeed low interest earning but low risk investment.

Figure 4.4 Loan and Advance to Total Asset (LTA)

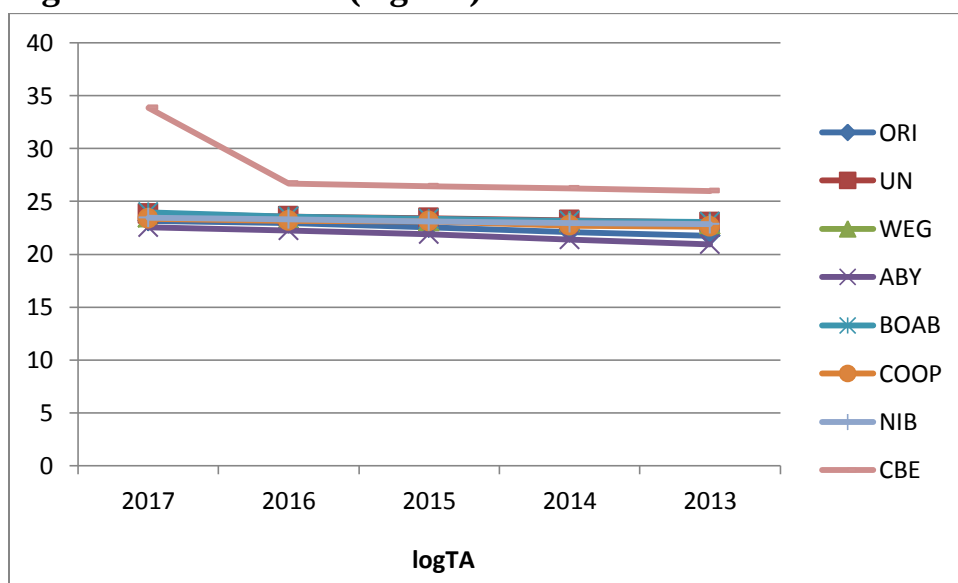


Source; Author's Computation (Excel)

Bank Size (log TA)

The Log TA increases from 20.93% in the year 2013 to 33.82% in the year 2017. Thus the bigger the size of the banks, the better they would be to utilize the economies of scale and reduce the credit risk. However, the growth should be without compromising the sound credit planning of the banks.

Figure 4.5 Bank Size (log TA)



Source; Author's Computation (Excel)

4.4. Testing the Classical Linear Regression Model (CLRM) Assumptions

4.4.1. Unusual and influential data

There are several ways to diagnose unusual and influential data that can have effect on the estimate of regression coefficients; the Cook's D assumption is suitable for the overall measure of influence. The lowest value Cook's D can assume is zero, and the higher the Cook's D is, the influential the point. The convention cut-off point is $4/n$, in this case the data meet the assumption.

Table 4.2 Cook's D assumption

```
. list ROA PRTL CLA LTA logTA d if d>4/40
```

	ROA	PRTL	CLA	LTA	logTA	d
1.	.0016778	.09033613	.129	.70028011	23.38213	.3250036
30.	.00002983	.00035341	1.1221815	.00031493	33.82445	.5936108
32.	.03561956	.34839568	.96541789	.36087552	26.67552	.6579776
33.	.06474177	.05524735	.11125151	.16665145	22.71797	.1343985
40.	.04499738	.07126359	.11599056	.61439132	23.09229	.2220204

Source; Author's Computation (STATA 14.0)

4.4.2. Checking normality

Normality of residuals is only required for valid hypothesis testing, that is the normality assumption assures that the p-value for the t-test and F-test will be valid. OLS regression merely requires that the residual (errors) be identically and independently distributed. There are numerical tests for testing normality. The swilk test which performs the Shapiro-Wilk test for normality is one of the tests. The p-value is based on the assumption that the distribution is normal. In this case it is (.06962), indicating that we cannot reject that r is normally distributed.

Table 4.3 Checking normality

```
. swilk r
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
r	40	0.94892	2.019	1.479	0.06962

```
.
```

Source; Author's Computation (STATA 14.0)

4.4.3. Checking Homoscedasticity

The assumption of homogeneity of variance of the residuals used to make sure the model is well-fitted. The table below shows Breusch-pagan test for Heteroscedasticity. It tests the null hypothesis that the variance of the residual is homogenous. Therefore if, the p-value is very small, we would have to reject the hypothesis and accept the alternative hypothesis that the variance is not homogenous. So in this case, the evidence is against the null hypothesis that the variance is homogenous.

Table 4.4 Checking Homoscedasticity

```
. estat hettest
```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of ROA

chi2(1) = 1.77

Prob > chi2 = 0.1835

Source; Author's Computation (STATA 14.0)

4.4.4. Checking for multicollinearity

Multi-collinearity exists when there are strong correlations among the predictors or independent variables and the existence of R-values Variance Inflation factor (VIF) greater than 10 in the

correlation matrix are the causes for the multi-collinearity existence (Field, 2009) Tolerance is a statistics used to indicate the variability of the specified independent variable that is not explained by the other independent variables in the model.

Table 4.5 Checking for multicollinearity

. vif

Variable	VIF	1/VIF
CLA	6.06	0.165103
logTA	3.43	0.291259
PRTL	2.47	0.405008
LTA	2.02	0.494039
Mean VIF	3.50	

Source; Author's Computation (STATA 14.0)

The VIF values are less than 10 (see table 4.5 above). And also the correlation matrix of all the variables have the paired values among the predictors are less than 0.80 (see table below) indicates that there were no multi-collinearity problems that alters the analysis of the findings; rather it leads to the acceptance of VIF values.

Table 4.6 correlation matrix

. correlate ROA PRTL CLA LTA logTA
(obs=40)

	ROA	PRTL	CLA	LTA	logTA
ROA	1.0000				
PRTL	0.0325	1.0000			
CLA	-0.3439	0.4886	1.0000		
LTA	-0.1156	0.0919	-0.5694	1.0000	
logTA	-0.2762	0.0480	0.7563	-0.5643	1.0000

Source; Author's Computation (STATA 14.0)

4.4.5. Checking linearity

Test for non-linearity in the case of multiple regressions made using the residual value after regression by using kernel density estimating the standardized residual against the predictors in the regression model. The results do not indicate strongly a clear departure from linearity (see appendix).

4.4.6. Model specification

There are a couple of methods to detect model specification errors. The error can occur when one or more relevant variables are omitted from the model or one or more irrelevant variables are included in the model. The linktest and the ovtest performs test of regression model specification error. The linktest is based on the idea that if a regression is properly specified. Whereas the ovtest performs a regression specification error test (RESET) for omitted variables. So we expect the p-value for predicted variable in the model ($\hat{y}$) should be significant (in this case p-value = .005) but the predictors ($\hat{y}^2$) value should be insignificant (in this case p-value = .736) because if the model is specified correctly. Also we can see the p-value of ovtest is greater than .05 which indicates the model is free from specification error. The linktest

Table 4.7 Model specification (The link test)

. linktest

Source	SS	df	MS	Number of obs	=	40
				F(2, 37)	=	29.48
Model	.003200303	2	.001600151	Prob > F	=	0.0000
Residual	.002008646	37	.000054288	R-squared	=	0.6144
				Adj R-squared	=	0.5935
Total	.005208949	39	.000133563	Root MSE	=	.00737

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
_hat	1.117585	.3697367	3.02	0.005	.3684276	1.866743
_hatsq	-1.887461	5.553768	-0.34	0.736	-13.14046	9.365543
_cons	-.0016763	.0066198	-0.25	0.801	-.0150892	.0117367

Source; Author's Computation (STATA 14.0)

Table 4.8 Model specification (ovtest)

```
. ovtest

Ramsey RESET test using powers of the fitted values of ROA
Ho: model has no omitted variables
      F(3, 32) =      0.60
      Prob > F =      0.6196
```

Source; Author's Computation (STATA 14.0)

4.5. Regression Analysis

The model estimated in the regression is mostly pointed out variables that have close link with credit risk. Nevertheless, there is a consideration for the cost of lending and bank size aspect in order to explain the effect of experience in lending which has high association with the age and bank size. Also, the effect of the cost efficiency parameter on performance parameter (ROA) is considered so as to assess the effect of non-provision costs on the profitability of Banks. The variable tested in the study includes **Return on Asset (ROA)**, **Loan to Total Asset (LTA)**, **Provision to Total Loans (PRTL)**, **Cost per Loan Asset (CLA)**, **Bank Size (log TA)**

As indicated in the regression output (Table 4.9 below) the appropriate indicators of the variable used to identify the ROA were explored. That is, the value of R square used to identify how much of the variance in the dependent variable (ROA) identified by the model. The larger the value of R square, the better the model is. The overall contribution of **Provision to Total Loans (PRTL)**, **Cost per Loan Asset (CLA)**, **Loan to Total Asset (LTA)**, **Bank Size (log TA)** for the **Return on Asset (ROA)**, accounted for 61.32% (adjusted R² = 0.5690). The rest 38.68% represents other independent variables not included in this study. Therefore, further research should be conducted to investigate the other (39%) factors influencing performance of Ethiopian commercial banks.

Table 4.9 Regression output

```
. regress ROA PRTL CLA LTA logTA
```

Source	SS	df	MS	Number of obs	=	40
Model	.003194032	4	.000798508	F(4, 35)	=	13.87
Residual	.002014916	35	.000057569	Prob > F	=	0.0000
				R-squared	=	0.6132
				Adj R-squared	=	0.5690
Total	.005208949	39	.000133563	Root MSE	=	.00759

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
PRTL	.1528165	.032853	4.65	0.000	.0861213	.2195117
CLA	-.0614606	.0095344	-6.45	0.000	-.0808165	-.0421047
LTA	-.0822797	.0151628	-5.43	0.000	-.1130619	-.0514976
logTA	.0018206	.0005911	3.08	0.004	.0006207	.0030206
_cons	.0271618	.0158438	1.71	0.095	-.0050028	.0593263

Source; Author's Computation (STATA 14.0)

The F- statistics in Table 4.9 above shows the significance of the model by the value of F- statistics ($P = .000$) and $F(4, 35) = 13.87$, which implies that there were strong relationship between the predictors and the outcomes of the regression variables. In addition, the model is best in explaining the effect of credit risk on banks performances.

In any regression model, the positive or negative sign of beta ($\hat{\alpha}$) shows the effect (increase or decrease) of the independent variables coefficients over the dependent variable. And as shown in Table 4.9 above, beta sign of the independent variables shows the positive and negative effect of the predicting independent variables. That means any proportional increase in the independent variables lead to a proportional increase in the dependent variable and vice versa. Therefore, based on the coefficients of the dependent variable (β sign), **Provision to Total Loans (PRTL) and Bank Size (log TA)** has positive relation with **return on assets**. **On the other hand**, of **Cost per Loan Asset (CLA)** and **Loan to Total Asset (LTA)** has negative relation with ROA.

$$ROA = .271 + .1528 PRTL + (-.061CLA) + (-.082LTA) + .0018logTA$$

The beta coefficients for provision to total loan and bank size (log TA) are positive. This implies direct relationship between the stated variables and performance measure, ROA. Thus a unit change for provision to total loan and bank size (logTa) have a direct effect in return on asset to the extent of .1528 and .0018 respectively. The surprising result is that the variable

coefficient is negative which implies that cost per loan asset and loan to total asset have inverse relationship with performance measure to the extent of $-.061$ and $-.082$ respectively. The coefficient of all variables revealed that statistically significant.

4.6. Discussion of the Result

As explained above, the identified credit risk related variables appear significant to affect profitability in the Ethiopian banking industry. These variables are the provision to total loans, cost to total loans, loan to total asset, and natural logarithm of total asset. Detail description of each item is as shown below.

The coefficient of the ratio of provision to total loans (PRTL) variable in the regression model which is an indicator of the level of credit risk has positive effect on profitability. In addition the variable is significant in explaining the effect of credit risk on the return on assets of Ethiopian commercial banks. The finding is consistence with (Altunbas, 2005) which yielded a positive relationship between PRTL and profitability. Such situation can only happen in cases of countries having a well- managed credit risk as revealed in the lowest share of nonperforming loans from their loan books, but not support the findings of Tadesse, (2015) and boru and Abdurasek, (2018).

The cost to loan ratio, which reveals the intermediation efficiency in terms of cost, appears most important determinant variable on the profit of banks. The variable is incorporated in the model to compare the impact of provisions vs non-provision costs on the profitability of banks. The surprising result is that this variable appears significant to affect bank's performance. Hence, this questions the Bank's capacity to undertake lending at lowest possible cost and instigated further research work on the efficiency of Banks in conducting intermediation activities. Obviously the variable has a negative relationship with the profitability measure. Literature also supports the result of this finding. For instance, (Athanasoglou et al., 2008; Goddard et al., 2009) has found out the negative relationship between cost of lending and profitability for banks in other country.

The ratio of loans to total asset which mainly measures bank's exposure to credit risk through converting the deposit liabilities they collected from customers to pertinent borrowers appear to have negative relationship with the profitability of Banks. In addition, the coefficient of the variable is significant values. This is not in line with the expected result because as revealed in

the balance sheet, Ethiopian banks are mainly engaged in intermediation business. Other income generating activities including investments are not widely practiced and banks highly rely on interest income from loans as the main and the dominant source of income. Fee based services are few and cannot yet replaced or diluted the share of income from intermediation activities. The study finding is supported by (Altunbas, 2005), he found out that the size of the loan in the total asset has a negative relationship with bank's profitability. This might result from poor credit quality.

The result of the study is that bank size has positive impact on profitability, hence supporting the argument that as bank's stay in the industry increases, their credit risk management system enables them to have limited level of credit risk exposures. Most of larger banks earn more profit than the smaller banks. Benefits associated with bank size if managed properly, include economies of scale, high bargaining power and stronger brand image of market power are also the main reasons behind the positive impact of size of large banks (Iloska, 2014). This is what the results seem to reflect in Ethiopian banking industry. The result also is supported by some literature, Tade and Mebratu, (2017), Tadesse, (2015), Ayadi and Boujelbene(2012), Pasiouras and Kosmidou (2007) found out that bank size appear to be an important variable to affect profitability in Ethiopian banking industry.

CHAPTER FIVE

5. SUMMERY, CONCLUSION AND RECOMMENDATION

5.1. Summary of Major Findings

The objective of this research was to establish the relationship between credit risk and financial performance of commercial banks in Ethiopia. Management of risk is viewed as a mechanism of ensuring financial performance of firms in the financial sector.

The paper tries to identify the effect of credit risk management on the performance of commercial banks in Ethiopia. Even if the literature review indicated that credit risk management has significant impact on the profitability of the firm but there is still ambiguity regarding the appropriate variables that might serve as proxies for credit risk management as a whole. Previous studies in Ethiopia were very few and studies in general were inconclusive. Motivated to fill this gap a regression analysis was employed on secondary data collected from 8 commercial banks for 5 years period (2013-2017).

The coefficient of determination, the R and the R-square is relatively high witnessing the high explanatory power of the model. As shown in table 4.9, the R-square figure is 0.6132 revealing that around 61% of the effect of credit risk is explained by the variables in the model. This is significantly high. The beta coefficients for provision to total loan and bank size are positive, while the loan to total asset and cost per loan asset are negative. This implies an inverse relationship between the stated variables and performance measure, ROA.

5.2. Conclusion

In line with the objective of this study to investigate the effect of credit risk management on the performance of commercial banks in Ethiopia. The researcher has adopted pure quantitative approach to reveal the comprehensive research problems and data were gathered from official banks annual report from the year 2013 to 2017. The collected financial data were analyzed using spread sheet (Excel) and STATA 14.0.

The output of Excel and STATA considering mainly variables related to lending activities. The coefficient of the ratio of provision to total loans (PRTL) variable in the regression model which

is an indicator of the level of credit risk has positive effect on profitability. In addition the variable is significant in explaining the effect of credit risk on the return on assets of Ethiopian commercial banks.

The credit administration cost (cost to loan ratio), which reveals the intermediation efficiency in terms of cost, appears most important determinant variable on the profit of Ethiopian commercial banks. The variable is incorporated in the model to compare the effect of provisions vs non-provision costs on the profitability of banks. The surprising result is that this variable appears significant to affect bank's performance.

The ratio of loans to total asset which mainly measures bank's exposure to credit risk through converting the deposit liabilities they collected from customers to pertinent borrowers ,by considering seriously the 7 "*C's*" of *Credit*, appear to have negative relationship with the profitability of Banks. In addition, the coefficient of the variable is significant and with large values.

The other variable, the natural logarithm of total asset (economies of scale) which is usually used to measure for bank's size appears to have a positive relationship with performance. The addition of the variable in the model is explained by: in the Ethiopian context bank size usually has association with the age of banks. It's assumed that as banks' stay in the industry increases their exposure to credit risk management will increase due to the learning curve effect.

The study therefore finds that the selected variables : the provision to total loans, cost to total loans, loan to total asset, and natural logarithm of total asset have significant effect on the performance of Banks. However, a certain variation in the magnitude and direction of their effect on the selected profitability measure, Return on Asset.

5.3. Recommendation

Based on the major findings the following recommendations were made:

- Ethiopian banks need to develop their credit risk management capacity by considering the practice of other developing countries, which have better experience in the industry; the high level of provision held for poorly performing assets mainly loans and advances is affecting the profitability of Banks. Hence, improving performance require to institute a strong credit risk management system that can efficiently identify bankable borrowers and a system that can monitor their performance after the loan is granted.
- In addition, the regulatory framework should support and make sure banks to have strong credit risk management practice. This can be done through strengthening the internal risk management system to assist the identification, measurement and monitoring of credit risk as well as directing the supervision focus towards credit risk.
- There should also be control over overhead costs related to lending; the study's finding on the large effect of non-provisions related costs entails banks' to put in place a cost control mechanisms for intermediation activities.
- Increasing the loan book size should be a priority task; the significant effect of the loan to total asset revealed that increasing the loan book size coupled with enhancing the intermediation activity should be the focus of the Ethiopian banking sector without compromising the sound credit planning that could arise as a result of diseconomies of scale.
- Commercial banks in Ethiopia should use different credit risk management tools, techniques and assessment models to manage their credit risk.
- The banks should consider using credit rationing and collateral requirement mechanism to reduce credit risk.

- In order to resolve the challenges faced by commercial banks in Ethiopia sound practice should be set out specifically to address the following areas:
 - ✓ Establishing an appropriate credit risk environment
 - ✓ Operating under sound a sound credit-granting process
 - ✓ Maintaining an appropriate credit administration, measurement and monitoring process and
 - ✓ Ensuring adequate control over credit risk.

Commercial banks in Ethiopia should give due attention to the mentioned variables and other variables which could have the possibility to affect the performance of banks.

Effective management of credit risk is a critical component of a compressive approach to risk management and essential to the long term success of any banking organization.

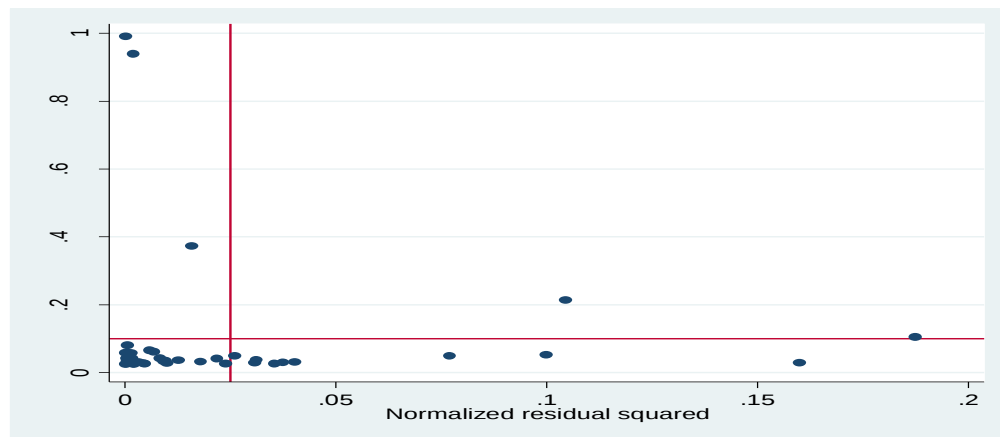
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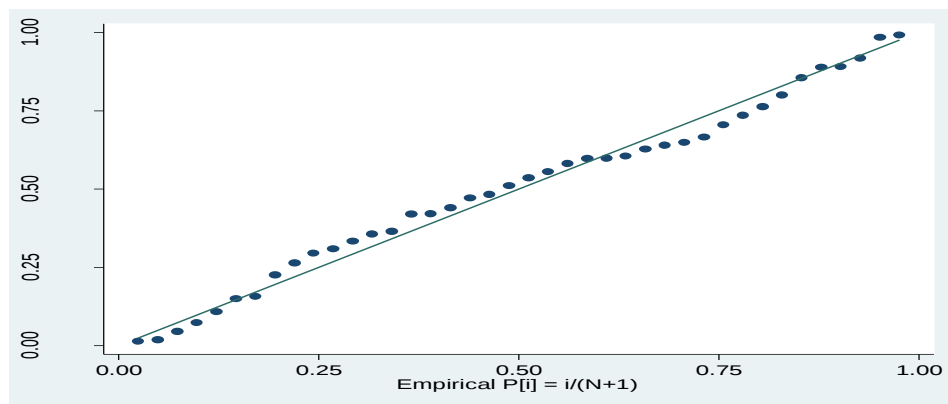
Appendices

Appendix i.

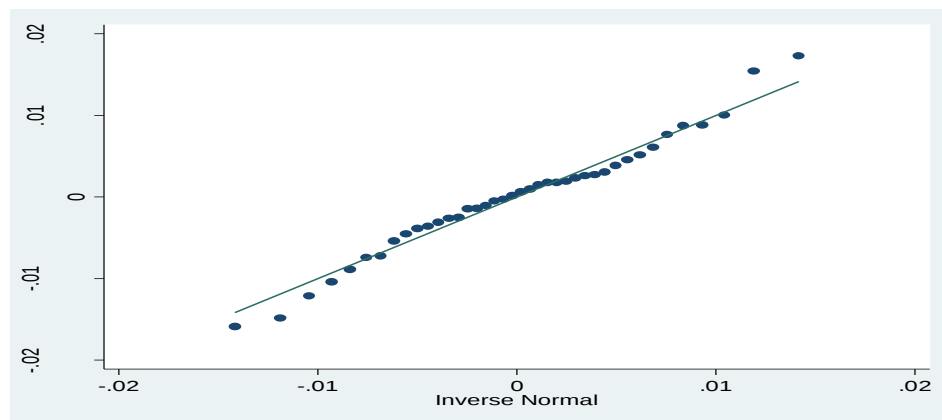


Source; Author's Computation (STATA 14.0)

Appendix ii.

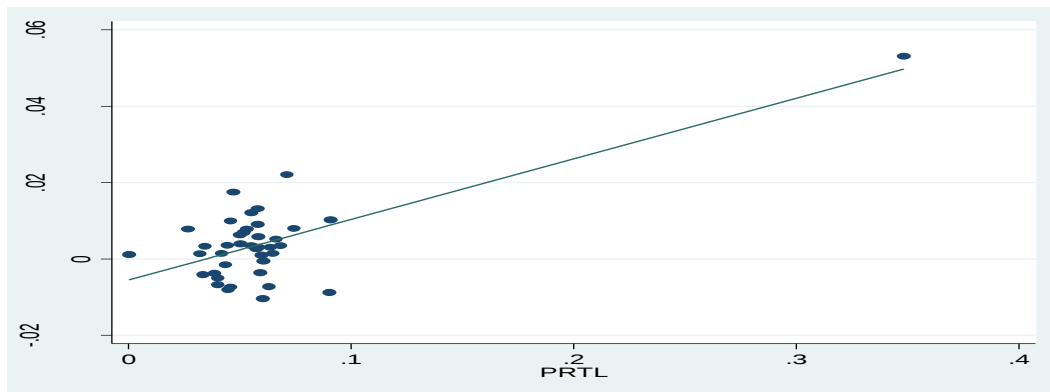


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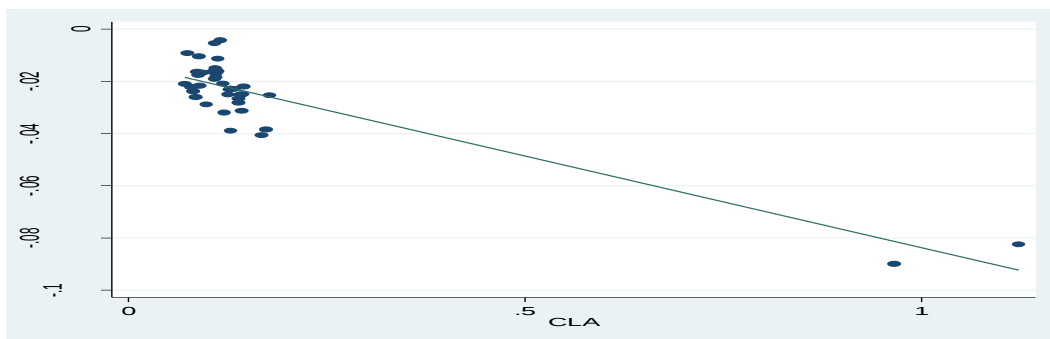


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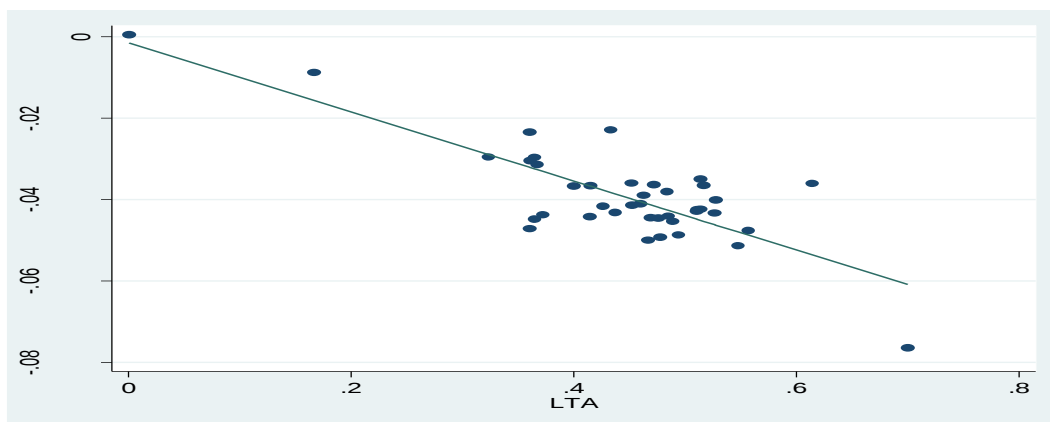
Appendix iii.



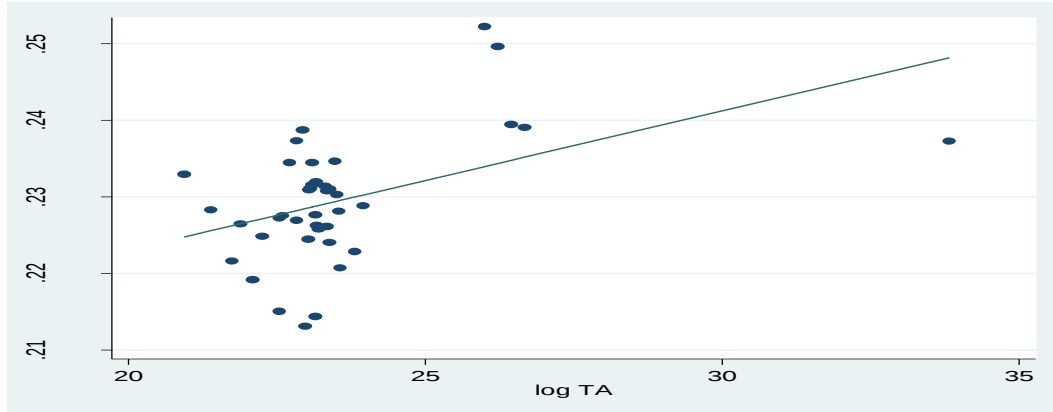
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