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THE EFFECT OF CREDIT RISK ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN ETHIOPIA

BY

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PERFORMANCE OF COMMERCIAL BANKS IN ETHIOPIA**

**A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF
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DEGREE OF MASTERS OF SCIENCE IN ACCOUNTING AND FINANCE**

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Declaration

I, Tesfaye Mulugeta, hereby declare that the thesis work entitled “The effect of credit risk on financial performance of commercial banks in Ethiopia” submitted by me for the award of the degree of Masters of Science in Accounting and Finance of Addis Ababa University at Addis Ababa, Ethiopia, is my original work and it has not been presented in any university. All sources and materials used for this thesis have been duly acknowledged.

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This is to certify that the thesis prepared by Tesfaye Mulugeta entitles: The effect of credit risk on financial performance of commercial banks in Ethiopia and submitted in partial fulfillment of the requirements for the degree of masters of Science in accounting and finance compiles with the regulations of the university and meets the accepted standards with respect to originality and quality.

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List of acronyms and abbreviations

AB	Awash Bank
CBE	Commercial Bank of Ethiopia
CBO	Cooperative Bank of Oromia
CLRM	Classical Linear Regression Model
DB	Dashen Bank
DW	Durbin-Watson
IMF	International Monetary Fund
LIB	Lion International Bank
LLTR	Loan Loss to Total Loan Ratio
LPTLA	Loan Provision to Total Loan and Advance
NBE	National Bank of Ethiopia
NPL	Non-Performing Loan
NPLLP	Non-Performing Loan to Loan Provision
NPLTLA	Non-Performing Loan to Total Loan and Advance
OLS	Ordinary Least Square
ROA	Return on Asset
ROE	Return on Equity
TL	Total Loan
TLATD	Total Loan and Advance to Total Deposit
UB	United Bank

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ABSTRACT

This study attempts to reveal the relationship between credit risk and financial performance of commercial banks in Ethiopia. In order to investigate these study quantitative research approach is employed based on documentary analysis. A panel data from six selected commercial banks covering the ten-year period (2007-2016) is analyzed within the fixed effects model on regression analysis and using E-view8 software. The study used one dependent variable return on asset (ROA), four independent variables that are: non-performing loan to total loan and advance ratio (NPLTLA), loan provision to total loan and advance ratio (LPTLA), total loan and advance to total deposit ratio (TLATD) and the ratio of non-performing loan to loan provision (NPLLP) as measures of credit risk. Both descriptive statistics and regression analysis specifically fixed effects model were used to analyze the relationships of the depended variable with explanatory variables. The regression result show that non-performing loan to total loan and advance ratio, loan provision to total loan and advance ratio and the ratio of non-performing loan to loan provision show negative and significant effect at 1% and 5% significance level on financial performance of commercial banks in Ethiopia. However, total loan and advance to total deposit ratio show positive and significant effect at 1% significance level on financial performance of commercial banks in Ethiopia. The research concluded that credit risk has significant effect on financial performance of commercial banks in Ethiopia. Hence, the study recommend in support of each variable for commercial banks of Ethiopia should enhance their capacity in credit analysis and loan administration.

Keywords: *Credit risk, Bank, Performance.*

CHAPTER ONE

1. Introduction

1.1 Background of the Study

Credit creation is the main income generating activity for the banks; however, this activity involves huge risks to both the lender and the borrower (Kargi, 2011). When financial institutions issue loans, there is a risk of borrower default and when banks collect deposits and on-lend them to other clients, they put client's savings at risk (Bessis, 2003). The risk of a trading partner not fulfilling his or her obligation as per the contract on due date or anytime thereafter can greatly jeopardize the smooth functioning of a bank's business. The default of small number of borrowers may result to large losses for a financial institution which can lead to massive financial distress affecting the whole economy (Bessis, 2003)

Credit risk is the potential that a credit borrower/counter party fails to meet the obligations on agreed terms. There is always scope for the borrower to default from his commitments for one or the other reason resulting in crystallization of credit risk by the financial institution (Pandey, 2004). These losses could take the form of outright default or alternatively, losses from changes in portfolio value arising from actual or perceived deterioration in credit quality. Credit Risk management is necessary to minimize the risk and maximize financial institution's risk adjusted rate of return by assuming and maintaining credit exposure within the acceptable parameters (Pandey, 2004).

Credit risk management is a structured approach to managing uncertainties through risk assessment, developing strategies to manage it and mitigation of risk using managerial resources (Kargi, 2011). The strategies include transferring to another party, avoiding the risk, reducing the negative effects of the risk, and accepting some or all of the consequences of a particular risk (Kargi, 2011).

Effective credit risk management is the process of managing an institution's activities which create credit risk exposures, in a manner that significantly reduces the likelihood that such activities will impact negatively on a bank's earnings and capital (NBE guideline issued in 2003). Credit risk is not confined to a bank's loan portfolio, but can also exist in its other assets and activities. Likewise, such risk can exist in both a bank's on-balance sheet and its off-balance sheet accounts (NBE guideline issued in 2003).

Credit or default risk is the risk that the promised cash flows from loans and securities held by financial institutions may not be paid in full. Should a borrower default, both the principal loaned and the interest payments expected are at risk (Saunders and Cornett, 2003). The potential loss a financial institution can experience suggests that financial institutions need to collect information about borrowers whose assets are in their portfolios and to monitor those borrowers overtime (Saunders and Cornett, 2003). Credit risk is the uncertainty associated with borrower's loan repayments. In general when borrowers' asset values exceed their indebtedness they repay loans but when borrowers' assets values are less than loan values, they do not repay and they could therefore exercise their option to default (Sinkey, 2002).

To minimize credit risk, banks are encouraged to use the "know your customer" principle as expounded by the Basel Committee on Banking Supervision (Kunt-Demirguc and Detragiache, 1997; Parry, 1999; Kane and Rice, 1998). Knowledge of the customer means that credit shall be granted only to those customers whom the commercial bank fully understands their business operations.

The National Bank of Ethiopia (NBE) developed risk management guidelines for the purpose of providing minimum direction to banks on risk management and create a working framework consistent with international standards and best practices which require banks to have a fully independent credit risk management responsible for capital adjustment and provision for escalating non-performing loans (NBE revised the risk management framework, 2003).

Girma (2011) asserted that in a small country like Ethiopia, the financial sector is still in the development phase and customer services are still in their infancy and banks revenue depends heavily on lending activities and credit growth is central to any banking organizations profit.

Thus, appropriate credit risk management system is the requirement of all banks, adjusting all complication of their credit portfolio. Origination of loan system has importance so there is a need for suitable analysis of borrower's credit worthiness (Girma, 2011). According to national bank of Ethiopia currently commercial banking system in Ethiopia comprises 17 commercial banks; 16 privately owned commercial banks and 1 public owned commercial bank. The loan portfolio is the largest asset and the main source of profitability for those commercial banks. The findings of this study will give a good insight for commercial banks of Ethiopia credit management experts and policy makers to increase its profitability and

market share by minimizing the credit risk factors. Therefore, the purpose of this study is to investigate the effect of credit risk on financial performance of commercial banks in Ethiopia.

1.2 Statement of the problem

Bessis (2005) the aim of every banking institution is to operate profitably in order to maintain its stability and improve in growth and expansion. For the commercial banking, lending represents the heart of the industry. Loans are the dominant asset at most banks, generate the largest share of operating income, and represents the bank's greatest risk exposure (Bessis 2005).

Weak credit risk management is the primary cause of many commercial banks' failures. McMenamin (1999) and Hempeletetal (1994) carried out studies and found out that the consistent element in the failures was the inadequacy of the bank's credit risk management system in the controlling of loan quality.

Saundeers (2005) indicated that the very nature of the banking business is so sensitive because more than 85% of their liability is deposits from depositors. Banks use these deposits to generate credit for their borrowers, which in fact are a revenue generating activity for most banks (Saundeers, 2005). This credit creation process exposes the banks to high default risk which might led to financial distress including bankruptcy. All the same, beside other services, banks must create credit for their clients to make some money, grow and survive stiff competition at the market place (Saundeers, 2005).

Currently in Ethiopia seventeen commercial banks are in operation. According to NBE based on their paid up capital commercial banks can be classified in to three categories that is big size, medium size and small size.

Girma (2011) conducted a study on credit risk management and its impact on performance of Ethiopian commercial Banks and Agegnehu (2013) conducted a study on credit risk management and the performance of Ethiopian commercial banks and found that credit risk and non-performing loan have been major challenges which affected the performance of commercial banks in Ethiopia.

Girma (2011) and Agegnehu (2013) in their studies only selected that big size (CBE) and medium sized commercial banks as a sample. Hence, it failed to disclose the literature gap by incorporating those small sized commercial banks in their samples. Therefore, this study

incorporated those small sized commercial banks and tried to disclose the gap. The purpose of this study is to investigate the effect of credit risk on financial performance of commercial banks in Ethiopia.

1.3. Research questions

Based on the above statement of problem the researcher develops the following research question.

- Does credit risk influence the performance of Ethiopian commercial banks?

1.4 Objective of the study

1.4.1. General Objective

The main objective of the research is to investigate the effect of credit risk on financial performance of commercial banks in Ethiopia.

1.4.2. Specific objectives

This study attempt to achieve the following specific objectives

- 1 To analyze the effect of non-performing loan to loan provision ratio on performance of commercial banks in Ethiopia
- 2 To examine the effect of loan provision to total loan and advance ratio on performance of commercial banks in Ethiopia.
- 3 To scrutinize the effect of non-performing loan to total loan and advance ratio on performance of commercial banks in Ethiopia.
- 4 To investigate the effect of total loan and advance to total deposit ratio on performance of commercial banks in Ethiopia.

1.5 Research hypothesis

Better credit risk management has high return on asset (ROA) and lower non-performing loan and loan provision. Accordingly with the help of empirical studies on selected firms the study was developed and tests the following hypothesis:

H1: Non-performing Loan to Loan provision ratio has negative and significant effect on the performance of commercial banks in Ethiopia.

H2: Loan Provision to Total Loan and Advance ratio has negative and significant effect on the performance of commercial banks in Ethiopia.

H3: Non-performing Loan to Total Loan and Advance ratio has negative and significant effect on the performance of commercial banks in Ethiopia.

H4: Total Loan and Advance to Total Deposit ratio has a positive and significant effect on the performance of commercial banks in Ethiopia.

1.6 Scope of the study

In terms of time sphere this study confined itself and only considered a time series data of 10 years (2007 - 2016) on the identified proxy performance indicators of Return on Asset and proxy credit risk indicators of Non-Performing Loan to Loan Provision, Loan Provision to Total Loan and Advances, Non-Performing Loan to Total Loan and Advances and Total Loan and Advances to Total Deposit.

Considering the above mentioned circumstances, the results of the study are limited to selected commercial banks as a sample and are generalized to all Ethiopian commercial banks. Finally, the study used the quantitative approach and focus on the description of the outputs from software and give the researcher own explanation.

1.7 Limitations the Study

This study is limited to detecting the relationship between credit risk management and performance of Ethiopian commercial banks. Thus, other financial risks are not discussed. In addition to this, the researcher only used return on asset as a performance measure and four proxy credit risk indicators to measure the performance of commercial banks, as a result of this it's considered as a limitation for this particular study.

1.8 Significance of the study

The study has important for commercial bank credit risk managers and policy makers about credit risk in the Ethiopian banking system and its impact on performance. Thus, the findings have developed a framework for measuring and assessing credit risk which is an important element for the financial stability unit at National Bank of Ethiopia. In general, the study will have a great importance for commercial banking firms in order to make adequate control over credit management system to make profitability sustainable. It can also act as a source of

literature for other scholars who intend to carry out further research on the effect of credit risk on financial performance with specific reference to banking institutions

1.9 Organization of the Study

The study consists of five chapters. The first chapter deals with introductory part which consists of background of the study, statement of the problem, objective(s) of the study, significance of the study, and scope and limitation of the study. The second chapter deals with review of theoretical and empirical literature. The third chapter deals with methodology of the study. The fourth chapter presents the analysis and discussions of the results of the study and finally, in the fifth chapter based on the analysis summary of major findings, conclusions and recommendations has forward.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter summarizes the information from the available literature in the same field of study. It reviews theories of credit management as well as empirical studies on credit risk management, the gaps in existing literature described and developed conceptual framework.

2.2. Theoretical Review

2.2.2. Meaning of risk

As Ralph (2000) defined risk is the existence of uncertainty about future outcomes. Risk is a key factor in economic life because people and firms make irrevocable investments in research and product development, plant and equipment, inventory, and human capital, without knowing whether the future cash flows from these investments will be sufficient to compensate both debt and equity holders. If such real investments do not generate their required returns, then the financial claims on these returns will decline in value (Ralph, 2000).

2.2.2. Meaning of Credit Risk

Financial institutions are exposed to a variety of risks among them; interest rate risk, foreign exchange risk, market risk, liquidity risk, operational risk and financial risk (Yusuf, 2003; Cooperman, Gardener and Mills, 2000). Credit or counterparty risk is defined as the chance that a debtor or financial instrument issuer will not be able to pay interest or repay the principal according to the terms specified in a credit agreement (Hennie van Greuning 2003). Credit risk means that payments may be delayed or ultimately not paid at all, which can in turn cause cash flow problems and affect liquidity (Hennie van Greuning 2003).

Credit risk is the risk of a loss resulting from the debtor's failure to meet its obligations to the bank in full when due under the terms agreed (Raghavan, 2003). Credit risk is the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. Generally the credit risk is associated with traditional lending activities of banks and it is simply described as risk a loan not being repaid in part or in full (Hempel and Simonson, 1999).

All banks have their own credit philosophy established in a formal written loan policy that must be supported and communicated with an appropriate credit culture (Hempel and Simonson, 1999). A credit culture is successful when all employees in the bank are aligned with the management's lending priorities (Hempel and Simonson, 1999).

2.2.3. Types of credit risk

Concerning the classifying of credit risk, different writers have expressed various criteria. For example, Hennie (2003) list in his book that the three types of credit risk are personal or consumer, company or corporate and sovereign or country risks, while Culp and Neves (1998) pointed out realized default risk and resale risk being the two types of credit risk. What is adopted here is part of the views from Horcher (2005), who defines more types of credit risk, including default risk, counterparty pre-settlement risk, counterparty settlement risk, legal risk, country or sovereign risk and concentration risk that are six. According to Mckinley & Barrickman (1994), credit risk also contains transaction risk, intrinsic risk & concentration risk.

1. Transaction Risk: It focuses on the volatility in credit quality and earnings resulting from how the bank underwrites individual loan transactions. Transaction risk has three scopes: selection, underwriting and operations (Mckinley & Barrickman, 1994).

2. Intrinsic Risk: It focuses on the risk inherent in certain lines of industry and loans to certain industries. Commercial real estate construction loans are inherently more risky than consumer loans. Intrinsic risk addresses the susceptibility to historic, predictive, and lending risk factors that typify an industry or line of business. Historic elements address prior performance and stability of the industry or line of business. Predictive elements focus on characteristics that are subject to change and could positively or negatively affect future performance. Lending fundamentals focus on how the collateral and terms offered in the industry or line of business affect the intrinsic risk (Mckinley & Barrickman, 1994).

3. Concentration Risk: Concentration risk is the aggregation of transaction and intrinsic risk within the portfolio and may result from loans to one borrower or one industry, geographic area, or lines of business. Bank must define acceptable portfolio concentrations for each of these aggregations. Portfolio diversify achieves an important objective. It allows a bank to

avoid disaster. Concentrations within a portfolio will determine the magnitude of difficulties a bank will experience under adverse conditions (Mckinley & Barrickman, 1994).

2.2.4. Credit risk management

Experiences elsewhere in the world suggest that the key risk in a bank has been credit risk. Indeed, failure to collect loans granted to customers has been the major factor behind the collapse of many banks around the world (NBE guideline issued in 2003). Banks need to manage credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Additionally, banks should be aware that credit risk does not exist in isolation from other risks, but is closely intertwined with those risks (NBE guideline issued in 2003). Effective credit risk management is the process of managing and institution's activities which create credit risk exposures, in a manner that significantly reduces the likelihood that such activities will impact negatively on a bank's earnings and capital. Credit risk is not confined to a bank's loan portfolio, but can also exist in its other assets and activities. Likewise, such risk can exist in both a bank's on-balance sheet and its off-balance sheet accounts (NBE guideline issued in 2003).

Credit risk management is inherent in banking and is unavoidable. The basic function of bank management is risk management. Banks assume credit risk when they act as intermediaries of funds and credit risk management lies at the heart of commercial banking (Haim and Thierry, 2005). The business of banking is credit and credit is the primary basis on which a bank's quality and performance are adjusted. Credit risk is composed of default risk and credit mitigation risk. Default risk is the risk that the counterparty will default on its obligations to the investor (Haim and Thierry, 2005). In this risk, the credit quality deteriorates (or default risk increases). Credit risk is more difficult to measure because data on both default and recovery rates are not extensive, credit returns are highly skewed and fat tailed and longer term time horizon and higher confidence levels are used in measuring credit risks. These are problems in measuring credit risk that have inspired the development of several sophisticated models and commercial software products for measuring portfolio credit risk (Haim and Thierry, 2005).

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 impact of credit risk management on banks' profitability (Kargi, 2011).

Girma (2011) in a small country like Ethiopia, the financial sector is still in the development phase and customer services are still in their infancy and banks revenue depends heavily on lending activities and credit growth is central to any banking organizations profit (Kargi, 2011). Girma (2011) in his research paper supposed that nature of Ethiopian commercial banking business is, so sensitive because more than 85% of their liability is deposits from depositors, all banks aggressively use these deposits to generate credit for their borrowers to make some money, grow and survive stiff competition at the market place and this credit creation process exposes the banks to high default risk.

Basel (1999) credit risk management processes forces the banks to establish a clear process in for approving new credit as well as for the extension to existing credit. These processes also follow monitoring with particular care and other appropriate steps are taken to control or mitigate the risk of connected lending (Basel, 1999). Credit risk management processes enforce the banks to establish a clear process in for approving new credit as well as for the extension to existing credit. These processes also follow monitoring with particular care and other appropriate steps are taken to control or mitigate the risk of connected lending (Basel, 1999).

Banks have credit policies that guide them in the process of awarding credit. Credit control policy is the general guideline governing the process of giving credit to bank customers (Payle, 1997). The policy sets the rules on who should access credit, when and why one should obtain the credit including repayment arrangements and necessary collaterals. The methods of assessment and evaluation of risk of each prospective applicant are part of a credit control policy (Payle, 1997).

2.2.5. Sources of Credit Risk

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. The main sources of credit risk include, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management,

inappropriate laws, low capital and liquidity levels, directed lending, massive licensing of banks, poor loan underwriting, reckless lending, poor credit assessment., no non-executive directors, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank (Coyle, 2000). To minimize these risks, it is necessary for the financial system to have well-capitalized banks, service to a wide range of customers, sharing of information about borrowers, stabilization of interest rates, reduction in non-performing loans, increased bank deposits and increased credit extended to borrowers. Loan defaults and nonperforming loans need to be reduced (Bank Supervision Annual Report, 2006; Laker, 2007; Sandstorm, 2009).

Credit risk largely arises in assets shown on the balance sheet, but it can also show up on off balance sheet in a variety of contingent obligations. Okorie (1998) identified poor project supervision, evaluation and management; untimely loan disbursement; diversion of funds; and dishonesty of loan beneficiaries as causes of loan default which ultimately leads to credit risk.

Theoretically there are so many reasons as to why loans fail to perform. Some of these include depressed economic conditions, high real interest rate, inflation, lenient terms of credit, credit orientation, high credit growth and risk appetite, and poor monitoring among others. Bercoff et al. (2002) categorizes causes of nonperforming loans to bank specific and macroeconomic conditions.

2.2.6. Credit Risk Exposures in Banks

Generally, credit risk is related to the traditional bank lending activities, while it also comes from holding bonds, interbank transactions, trade financing, foreign exchange transactions, in the extension of commitments and guarantees, and the settlement of transactions. Various financial instruments including acceptances, interbank transactions, financial futures, guarantees, etc also increase banks' credit risk (Bercoff et al. 2002).

2.2.7. General Principles of Sound Credit Risk Management in Banking

Credit risk is most simply defined as the potential that a bank borrower or counter party will fail to meet his obligations in accordance with agreed terms (Adams & Mehran, 2004). Boateng (2004) asserts that 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 of not more than five (5%) of default rate. Banks therefore 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. According to Machiraju (2004) 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.

The Basel Committee on Banking Supervision (1999; 2000; 2001) having assessed the challenges associated with banks management of credit globally, issued some guidelines that have come to be regarded as benchmark credit risk management practices in order to promote sound practices for managing credit risk. The report of the Basel Committee on Banking Supervision (2000) on credit risk focused on some four main areas as critical in every credit management process. These areas are establishing an appropriate credit environment, operating a sound credit granting process, ensuring adequate controls over credit risk and evaluation and enforcement of protective covenants.

A. Establishing an appropriate credit environment

According to Wheehem & Hunger (2008), the controlling and directing mind of every organization is the board of directors. As with all other areas of a bank's activities, the board of directors has a critical role to play in overseeing the credit granting and credit risk management functions of the bank. The board of directors, according to the report of the Basel Committee (2000) should have responsibility for approving and periodically (at least annually) reviewing the credit risk strategy and significant credit risk policies of the bank. According to Saunders (2005), these strategies should reflect the bank's tolerance for risk and the level of profitability the bank expects to achieve for incurring various credit risks.

Each bank should develop a credit risk strategy or plan that establishes the objectives guiding its credit-granting activities and adopt the necessary policies and procedures for conducting such activities (Machiraju, 2004). The board needs to recognize that the strategy and policies must cover the many activities of the bank in which credit exposure is a significant risk.

The strategy should include a statement of the bank's willingness to grant credit based on exposure type (for example, commercial, consumer, and real estate), economic sector, geographical location, currency, maturity and anticipated profitability (Matyszak, 2007). This might also include the identification of target markets and the overall characteristics that the bank would want to achieve in its credit portfolio (including levels of diversification and tolerances).

Again, Boateng's (2004) study shows that the credit risk strategy of a bank should give recognition to the goals of credit quality, earnings and growth. Every bank, regardless of size, is in business to be profitable and, consequently, must determine the acceptable risk-return trade-off for its activities, factoring in the cost of capital. A bank's board of directors should approve the bank's strategy for selecting risks and maximizing profits. The board should periodically review the financial results of the bank and, based on these results, determine if changes need to be made to the strategy. The board must also determine the degree of the bank's capital adequacy (Boateng, 2004).

According to Wilson (1998), the credit risk strategy of any bank should provide continuity in approach. Therefore, the strategy will need to take into account the cyclical aspects of the economy and the resulting shifts in the composition and quality of the overall credit portfolio. Although the strategy should be periodically assessed and amended, it should be viable in the long-run and through various economic cycles (Machiraju, 2004).

Fotoh (2005), states that the credit risk strategies and policies should be effectively communicated throughout the organization. All relevant personnel should clearly understand the bank's approach to granting and managing credit and should be held accountable for complying with established policies and procedures. The board should ensure that senior management is fully capable of managing the credit activities conducted by the bank and that those activities are done within the risk strategy, policies and tolerances approved by the board (Basel Committee, 2001). The board should also regularly (i.e. at least annually), either within the credit risk strategy or within a statement of credit policy, approve the bank's overall credit-granting criteria (including general terms and conditions). In addition, it should approve the manner in which the bank will organize its credit-granting functions, including independent review of the credit granting and management function and the overall portfolio (Wilson, 1998).

While members of the board of directors, particularly outside directors, can be important sources of new business opportunities for the bank, once a potential credit is introduced, the bank's established processes should determine how much and at what terms credit is granted (Machiraju, 2004). In order to avoid conflicts of interest, as asserted by Wilson (1998), it is important that board members do not override the credit-granting and monitoring processes of the bank.

Fotoh (2005) states that once the board of directors has come out with a sound credit management environment, senior management, led by the Chief Executive Officer, should have responsibility for implementing the credit risk strategy approved by the board of directors and for developing policies and procedures for identifying, measuring, monitoring and controlling credit risk. Such policies and procedures should address credit risk in all of the bank's activities and at both the individual credit and portfolio levels. Senior management of a bank is responsible for implementing the credit risk strategy approved by the board of directors. The responsibility for implementing the strategy includes ensuring that the bank's credit-granting activities conform to the established strategy, that written procedures are developed and implemented, and that loan approval and review responsibilities are clearly and properly assigned Fotoh (2005). Senior management must also ensure that there is a periodic independent internal assessment of the banks credit-granting and management functions.

According to Boateng (2004), a cornerstone of safe and sound banking is the design and implementation of written policies and procedures related to identifying, measuring, monitoring and controlling credit risk. Credit policies establish the framework for lending and guide the credit-granting activities of the bank. Credit policies should address such topics as target markets, portfolio mix, price and non-price terms, the structure of limits, and approval authorities (Basel committee, 2001). Such policies, according to Harper (2008), should be clearly defined, consistent with prudent banking practices and relevant regulatory requirements, and adequate for the nature of the bank and this may be difficult for very small banks.

However, there should be adequate checks and balances in place to promote sound credit decisions. The policies should be designed and implemented within the context of internal and external factors such as the bank's market position, trade area, staff capabilities and technology. Policies and procedures that are properly developed and implemented enable the bank to: (i) maintain sound credit-granting standards, (ii) monitor and control credit risk, (iii) properly evaluate new business opportunities; and (iv) identify and administer problem credits (Machiraju, 2004).

According to Sinkey (1998), banks consider the involvement of the Chief Executive Officer (CEO), information generation and processing, and supervision as key elements of their risk management and reporting systems. The components of a bank's overall risk management

and reporting system focuses on such factors as: corporate organization structure, organization of risk management, organization of lending, approval process, credit administration, risk management function and loan quality reporting.

The Chief Executive Officer must be involved in the formulation and implementation of credit policies that should incorporate the overall risk management and reporting system of the bank. According to Sinkey (1998), every bank must have a credit policy that will guide the credit activities and thereby reduce credit risk and improve profitability. Generally, a loan policy consists of five major components:

General Policies:- Management, Trade area, Balance loan portfolio, Portfolio administration, Loan-to-deposit ratio, Legal loan limit, Lending authority, Loan responsibility, Interest Rates, Loan repayment, Collateral, Credit information and documentation, Delinquency ratio, Loan loss Reserves, Charge-offs, Extensions of renewals of past due loans, Consumer laws and regulations(Sinkey, 1998).

Specific Loan Categories:- Commercial loans, Agricultural loans, Mortgage loans, Installment and branch bank loans, VISA and revolving credits, Mortgage banking subsidiary, Personal loans (Sinkey, 1998).

Miscellaneous Loan Policies:- Loan to Executive Officers, directors and shareholders, Employee loans, Mortgage- Banking subsidiary, Conflict of interest (Sinkey, 1998).

Quality Control:- Credit Department, Loan Review Department, Recovery Department (Sinkey, 1998).

Committees:- Directors loan committee, Officers loan committee, Loan Review Committee (Sinkey, 1998).

B. Operating a sound credit granting process

The Basel Committee (2000; 2001) asserts that in order to maintain a sound credit portfolio, a bank must have an established formal transaction evaluation and approval process for the granting of credits. Approvals should be made in accordance with the bank's written guidelines and granted by the appropriate level of management. There should be a clear audit trail documenting that the approval process was complied with and identifying the individual(s) and/or committee(s) providing input as well as making the credit decision (Boateng, 2004). According to Wilson (1998), banks often benefit from the establishment of

specialist credit groups to analyze and approve credits related to significant product lines, types of credit facilities and industrial and geographic sectors.

Banks should invest in adequate credit decision-making resources so that they are able to make sound credit decisions consistent with their credit strategy and meet competitive time, pricing and structuring pressures (Khambata, 1996).

Each credit proposal should be subjected to careful analysis by a qualified credit analyst with expertise commensurate with the size and complexity of the transaction. According to Boateng (2004), an effective evaluation process establishes minimum requirements for the information on which the analysis is to be based. There should be policies in place regarding the information and documentation needed to approve new credits, renew existing credits and/or change the terms and conditions of previously approved credits.

According to Machiraju (2004), one of the management principles that banks have employed in their customer information gathering process is screening. Screening involves the process of identifying only reliable and creditworthy customers from a pool of numerous applicants for financial assistance. Banks screen “good” credit risk from “bad” ones so as to make profitable loans. Screening is usually carried out before a loan is granted.

Effective screening requires banks to collect accurate and reliable information from potential borrowers. The aim is to evaluate the default risk of their customers. The potential borrower is normally required to supply the loan officer with information about their background, income and net worth. Different credit risk models ranging from qualitative to quantitative ones may be used to facilitate the screening process to arrive at an informed decision. Schonbucher (2000) and Machiraju (2004) assert that banks have traditionally focused on the principles of five Cs to estimate borrowers’ creditworthiness. These five C’s are:

- i. *Character*. This refers to the borrower’s personal characteristics such as honesty, willingness and commitment to pay debt. Borrowers who demonstrate high level of integrity and commitment to repay their debts are considered favorable for credit (Schonbucher, 2000 and Machiraju, 2004).
- ii. *Capacity*. This also refers to borrowers’ ability to contain and service debt judging from the success or otherwise of the venture into which the credit facility is employed. Borrowers who exhibit successful business performance over a reasonable

past period are also considered favorable for credit facility (Schonbucher, 2000 and Machiraju, 2004).

- iii. *Capital*. This refers to the financial condition of the borrower. Where the borrower has a reasonable amount of financial assets in excess of his financial liabilities, such a borrower is considered favorable for credit facility (Schonbucher, 2000 and Machiraju, 2004).
- iv. *Collateral*. These are assets, normally movable or unmovable property, pledged against the performance of an obligation. Examples of collateral are buildings, inventory and account receivables. Borrowers with a lot more assets to pledge as collateral are considered favorable for credit facility (Schonbucher, 2000 and Machiraju, 2004).
- v. *Condition*. This refers to the economic situation or condition prevailing at the time of the loan application. In periods of recession borrowers find it quite difficult to obtain credit facility (Schonbucher, 2000 and Machiraju, 2004).

In addition to the five Cs, Machiraju (2004) asserts that bankers and analysts have employed many different models to assess the default risk on loans and bonds. These vary from relatively qualitative to highly quantitative models. Further, these models are not mutually exclusive, in that a financial institutions manager may use more than one to reach a credit pricing or loan quantity rationing decision.

The information received will be the basis for any internal evaluation or rating assigned to the credit and the accuracy and adequacy of the information are critical to management for making appropriate judgments about the acceptability of the credit. Banks must develop a corps of credit risk officers who have the experience, knowledge and background to exercise prudent judgment in assessing, approving and managing credit risks. A bank's credit-granting and approval process should establish accountability for decisions taken and designate who has the absolute authority to approve credits or changes in credit terms (Machiraju, 2004).

C. Ensuring adequate controls over credit risk

In order to ensure adequate controls over credit, Ganesan (2000) asserts that there must be credit limits set for each officer whose duties have something to do with credit granting.

Material transactions with related parties should be subject to the approval of the board of directors (excluding board members with conflicts of interest), and in certain circumstances (e.g. a large loan to a major shareholder) reported to the banking supervisory authorities.

Banks must also consider the time frame for granting credit since time is of particular importance to borrowers. Borrowers usually require credit within a given time, and for such credits to be worthwhile they must be granted within the period the facility is required. According to Hubbard (2000), if a borrower requires a credit within, say, one month, the lending bank must meet such time period without undue delays. This implies that lending institutions must make known in unequivocal terms to the borrowers the terms and conditions to granting the credit. Having granted credit there is the need for maintaining an appropriate credit administration, measurement and monitoring process. Again, banks must establish a system of independent, continuous assessment of clients' operational results, looking out for early warning signs of operational difficulties (Mueller, 1998; Rachev, Schwartz & Khindanova, 2000).

D. Maintaining an Appropriate Credit Administration, Measurement and Monitoring Process

Credit administration is a critical element in maintaining the safety and soundness of a bank. Once a credit is granted, it is the responsibility of the bank to ensure that credit is properly maintained. This includes keeping the credit file up to date, obtaining current financial information, sending out notices and preparing various documents such as loan agreements, and follow-up and inspection reports (Wesley, 1993).

Credit administration, as emphasized by Wesley (1993), can play a vital role in the success of a bank, since it is influential in building and maintaining a safe credit environment and usually saves the institution from lending sins. Therefore, banks should never neglect the effectiveness of their credit administration operations. Then talking about credit risk measurement in banks, it is required that banks should adopt effective methodologies for assessing the credit risk inherent both in the exposures to individual borrowers and credit portfolios, and this will be explained in details later (Wesley, 1993). The last focus in this area of principles is related to credit risk monitoring, which is definitely a must in banks' risk management procedure. Banks should keep track on the borrowers' current financial conditions and ensure their compliance with the covenants. Both cash flows and collateral

adequacy should be ensured and the potential problem credits should be considered. In this way, banks are well in control of their credit qualities as well as all the related situations, and can react to any future changes timely and readily (Wesley, 1993). A proper credit monitoring system will provide the basis for taking prompt corrective actions when warning signs point to deterioration in the financial health of the borrower. The bank has to assess the credit worthiness of the borrower and even after the loan is granted, interim monitoring is required until when the borrower has finished repaying the loan. This monitoring is very important because with the uncertainty in the future, any potential event that can cause a borrower to default payment can be fast identified or, a mechanism can be put in place on time to reduce the frequency and/or intensify of a loss should it occur (Wesley, 1993).

E. The role of supervisors

Although the board of directors and senior management bear the ultimate responsibility for an effective system of credit risk management, supervisors should, as part of their ongoing supervisory activities, assess the system in place at individual banks to identify, measure, monitor and control credit risk. This should include an assessment of any measurement tools (such as internal risk ratings and credit risk models) used by the bank. In addition, they should determine that the board of directors effectively oversees the credit risk management process of the bank and that management monitors risk positions, and compliance with and appropriateness of policies (Wheehem & Hunger, 2008).

To evaluate the quality of credit risk management systems, supervisors can take a number of approaches. A key element in such an evaluation is the determination by supervisors that the bank is utilizing sound asset valuation procedures. Most typically, supervisors, or the external auditors on whose work they partially rely, conduct a review of the quality of a sample of individual credits. In those instances where the supervisory analysis agrees with the internal analysis conducted by the bank, a higher degree of dependence can be placed on the use of such internal reviews for assessing the overall quality of the credit portfolio and the adequacy of provisions and reserves. Supervisors or external auditors should also assess the quality of a bank's own validation process where internal risk ratings and/or credit risk models are used. Supervisors should also review the results of any independent internal reviews of the credit-granting and credit administration functions. Supervisors should also make use of any reviews conducted by the bank's external auditors, where available (Wheehem & Hunger, 2008).

2.2.8 Profitability and risk of banks

Berger and DeYoung (1997) banking profitability may also reflect the risk taking behavior of managers. Banks with high profitability are less pressured to revenue creation and thus less constrained to engage in risk credit offerings. At the same time, inefficient banks are more likely to experience high level of problem loans. Poor management can imply weak monitoring for both operating costs and credit quality of customers, which will include high levels of capital losses. Under this bad management hypothesis advances by Berger and DeYoung (1997), managers lack competencies to effectively assess and control risks incurred when lending to new customers. Garcíya-Marco and Robels-Fernendz (2007) found that profit maximizing policies will be accompanied by higher level of risk. The acceptance and management of financial risk is inherent to the business of banking and banks roles as financial intermediaries. Risk management as commonly perceived does not mean minimizing risk; rather the goal of risk management is to optimize risk-reward trade-off. Notwithstanding the fact that banks are in the business of taking risk, it should be recognized that an institution need not engage in business in a manner that unnecessarily imposes risk upon it nor should it absorb risk that can be transferred to other participants. Rather it should accept those risks that are uniquely part of the array of bank's services. An important aspect regarding various risk categories is their correlation Garcíya-Marco and Robels-Fernendz (2007).

2.2.9. Classification of loan and advances

National Bank of Ethiopia asserted that banks' advances can be classified into five categories, depending on their performance in terms of possibility of repayment. These categorizations are:

1. Pass

Advances in these categories are those for which the borrower is up-to-date with repayment of both principal and interest. Indications that an overdraft or loan is current indicate regular activity on the account with no sign that a hardcore of debt is building up. NBE asserts that a minimum of 1% of the aggregate outstanding balance of current advances should be provided against possible future defaults. This enables the bank to set aside part of current profits or earnings to offset any future default by beneficiaries of current advances.

2. Sub Mention

The loans and advances with pre-established repayment programs past due 30(thirty) days or more but less than 90(ninety) days, or overdraft and loan or advances that do not have pre-established re payment program, NBE asserts that minimum of 3% of aggregate outstanding of the current advances should be provided against possible future defaults.

3. Substandard advances

The loans and advances with pre-established repayment programs past due 90(ninety) days or more but less than 180(one hundred eighty) days, or overdraft and loan or advances that do not have pre-established re payment program, Substandard advances display well-defined credit weaknesses that jeopardize the liquidation of the debt. These categories of advances are advances for which the borrower's cash flow is not significant enough to meet current maturing debt, as well as the borrower lacking sufficient working capital to meet his operating needs. For substandard advances, a provision of about 20% of the aggregate net unsecured outstanding amount should be provided against current profit NBE (SBB/43/2008)

4. Doubtful advances

The loans and advances with pre-established repayment programs past due 180(one hundred eighty) days or more but less than 360(three hundred sixty) days, or overdraft and loan or advances that do not have pre-established re payment program, These categories of advances exhibit all the weaknesses inherent in advances classified as substandard with the added characteristics that the advances are not well secured and the weaknesses make collection or liquidation in full on the basis of current facts, conditions and values highly questionable and improbable. The possibility of loss is extremely high, but because of certain important and reasonably specific pending factors, which may work to the advantage and strengthening of the advance, its classification as an estimated loss is deferred until its exact status is determined. NBE (SBB/43/2008) states that as much as 50% of the aggregate net unsecured outstanding balance of doubtful advances should be provided against current profits to off-set future defaults.

5. Loss advances

Non-performing loans or advances with pre-established repayment program past due 360(three hundred sixty) days or more. Advances classified as loss advances are classified uncollectible and of such little value that their continuation as recoverable advances is not worthwhile. Non-performing advances which are overdue for 360 or more days are classified

as loss advances. According to the NBE (SBB/43/2008) as much as 100% of the aggregate net unsecured outstanding balance is provided for against current profits.

2.2.10. Determinants of credit risk

1. Proxy credit risk variables

I. Nonperforming loans

Nonperforming loans (NPLs) refer to those financial assets from which banks no longer receive interest and/or installment payments as scheduled. It is a loan that is in default or close to being in default. Many loans become non-performing later being in default for 3months, but this can depend on the contract terms. A loan is nonperforming when payments of interest and principal are past due by 3 months or more, or at least 3 months of interest payments have been capitalized, refinanced or delayed by agreement, or payments are less than 3months overdue, but there are other good reasons to doubt that payments will be made in full (International Monetary Fund (IMF), 2001)

They are known as non-performing because the loan comes to an end to perform or generate income for the bank. Choudhury et al. (2002) state that NPL is not a uniclass but it is a multiclass concept, which means that NPLs can be classified into different varieties. Usually based on the length of overdue of the said loans, NPLs are viewed as a typical byproduct of financial crisis: they are not a main product of the lending function but rather an accidental occurrence of the lending process, one that has enormous potential to deepen the severity and duration of financial crisis and to complicate macroeconomic management (Woo, 2000). This is because NPLs can bring down investors confidence in the banking system, piling up unproductive economic resources even though depreciations are taken care of, and impeding the resource allocation process.

In a bank-centered financial system, NPLs can further thwart economic recovery by shrinking operating margin and eroding the capital base of the banks to advance new loans. This is sometimes referred to as credit crunch (Bernanke et al., 1991).

In addition, NPLs, if created by the borrowers willingly and left unresolved, might act as a contagious financial malaise by driving good borrowers out of the financial market. Further, Muniappan (2002) argues that a bank with high level of NPLs is forced to incur carrying costs on non-income yielding assets that not only strike at profitability but also at the capital adequacy of a bank, and in consequence, the bank faces difficulties in augmenting capital resources. Bonin and Huang (2001) also state that the probability of banking crises increases

if financial risk is not eliminated quickly. Such crises not only lower living standards but can also eliminate many of the achievements of economic reform overnight.

II. Loan provision

Loan loss provision is an expense set aside as an allowance for uncollected loans loan payments. This provision is used to cover a number of factors associated with potential loan losses including bad loans, customer defaults and renegotiated terms of a loan that incur lower than previous estimated payment. <https://www.investopedia.com>

Loan Loss Provision' is a non-cash expense for banks to account for future losses on loan defaults. Banks assume that a certain percentage of loans will default or become slow-paying. Banks enter a percentage as an expense when calculating their pre-tax incomes. This guarantees a bank's solvency and capitalization if and when the defaults occur. The ratio of Loan Provision to Total loan and Advance (LP/TLA) is a measure for credit risk. It indicates banks' ability to generate income before the expectation of default occurs (Agegnehu, 2013)

III. Loan to deposit

The loan to deposit ratio is used to calculate a lending institutions ability to cover withdrawals made by customers. A lending institution that accepts deposit must have a certain measure of liquidity to maintain its normal daily operations. Loans given to its customer are mostly not considered liquid meaning that they are investments over long period of time. Although a bank will keep a certain level of mandatory reserves, they may also choose to keep a percentage of their non-lending investing in short term securities to ensure that any monies needed can be accessed in the short term (Agegnehu, 2013).

$$\text{Loan to deposit} = \text{total loan and advance} / \text{total deposit}$$

IV. Non-Performing Loan to Loan Provision

Is a loan that is in default or close to being in default out of loan provision in future or become slow-paying. The ratio of non-performing loan to loan provision (NPLLP) used as a measure for credit risk. The ratio of non-performing loan to loan provision, which measures how much a bank is suffer default in year relative to its reserved loan provision, is used to

measure the effect of non-performing loans to loan provision on performance of commercial banks in Ethiopia (Girma, 201).

$$\text{Non-performing Loan to Loan provision} = \text{Non-performing Loan} / \text{Loan provision}$$

2. Performance measure

Return on Asset (ROA)

Prior works on credit risk management and bank performance indicated that Return on assets (ROA) was an important measurement used in comparing the financial performance of banks (Girma, 2011; Agegehu, 2013). It is defined as Profit after Tax divided by Total Asset; reflect how well bank managers are using the banks real investment resource to generate profit. It shows the profit earned per dollar of assets and most importantly, reflects the management ability to utilize the bank's financial and real investment resources to generate profits. For any bank, ROA depends on the bank's policy decisions as well as uncontrollable factors relating to the economy and government regulations. Many regulators believe return on assets is the best measure of bank efficiency from the two major alternative measures of profitability, namely ROA and ROE. As highlighted by Athanasoglou et al. (2008) and Sufian (2011), many scholars suggest that ROA is the key ratio for the evaluation of bank performance given that ROA is not distorted by high equity multipliers, while ROE disregards the risks associated with high leverage and financial leverage.

2.3 Empirical Review

Credit Risk Management is a serious threat to the performance of banks; therefore various researchers have examined the effect of credit risk management on banks in varying dimensions.

Benson Mwai Karugu (2015) the study sought to analyze the effect of credit risk management practices on profitability of listed commercial banks at Nairobi Kenya. A descriptive research design was adopted. The population comprised of listed commercial banks where a sample of 55 employees was purposively sampled. The results indicated that credit risk governance had a positive and significant effect on profitability. Based on the study findings the study concluded that credit appraisal, debt collection and credit risk governance have a significant positive effect on profitability. It is thus recommended that commercial banks should have stringent credit appraisal and debt collection policies, credit personnel at all levels must work in co-ordination in order to ensure that credit is collected in a timely manner and banks should also adopt credit risk governance frameworks which can be attained by making the process of interaction between senior management and the Board more effective.

Ugirase Josiane Magnifique (2013) examined the effect of credit risk management on the financial performance of commercial banks in Rwanda. The findings of the study conclude that credit risk identification, credit scoring mechanism and credit analysis and assessment are good predictors of the model consequently those three indicators used of credit risk management have shown a positive relationship with the financial performance of commercial banks in Rwanda.

The prevailing relationship between profitability and credit risk is further complicated by the finding of Kithinji (2010). Employing a regression analysis on data collected from financial reports of commercial banks in Kenya for the period of 2004 to 2008 concluded that profitability of commercial banks measured by ROA did not show significant relationship with credit risk measures.

Joyce Wangari Githaiga (2015) the study was undertaken to analyze the effects of credit risk management practices on the performance of Financial Banking Institutions. The study attempted to establish if there exists any relationship between the credit risk management

determinants by use of CAMEL indicators and financial performance of commercial banks in Kenya. The finding of the study concludes that Credit Risk has a strong negative relationship with financial performance. This indicates that poor credit risk or high non-performing loans to total assets related to poor bank performance. Thus, Commercial banks with high credit risk and low non-performing loans are more profitable than the others.

Kargi (2011) estimated the effect of credit risk on the profitability on Nigerian banks. Data on credit risk and profitability ratios were collected from 2004 to 2008. The analysis of this data involved descriptive, correlation and regression techniques. The result was that the credit risk management has the substantial influence on the profitability of Nigerian banks. Other findings on the study showed that a rise in nonperforming loans negatively affected profitability and liquidity.

The ratio of loan loss to total loans (LLTR) is also significant determinant of banks profit (Sufian et al (2008). The rise in LLTR represents a rise in the credit risk the banks are exposed to. Hence higher credit risk affects profitability of a bank adversely. A study carried out by Vong et al (2009) revealed that, a loan loss provision is inversely related to the performance of banks in Macao.

Epure and Lafuente (2012) studied the impact of risk on the performance of banks in cost-Rican Banking industry during 1998-2007. The results showed the performance has an inverse relationship with non-performing loans and capital adequacy related positively with performance.

As short (1979) argues, size is closely related to the capital adequacy of a bank since relatively large banks tends to rise less expensive capital and, hence, appear more profitable the finding of also shows that return on equity ROE and return on asset ROA all indicating profitability where negatively related to the ratio of non-performing loan to total loan NPL/TL, of financial institutions therefore decrease profitability. According to Hempel and Simomson (1999), non-performing loans is a major credit risk indicator, depleting profitability and therefore a bank can lower its credit risk exposure by reducing it.

In Ethiopian case, studies on the relationship between credit risk and performance of commercial banks in Ethiopia are few through many studies documented that credit risk is

among the major challenges of bank in Ethiopia. Of these studies, Tibebe (2011) studied the effect of credit risk management on the performance of commercial banks in Ethiopia. Used secondary data from annual reports of the commercial banks showed that there is a negative relationship between credit risk and performance of commercial banks in Ethiopia

Girma (2011) examined Credit Risk Management and Its Impact on Performance on Ethiopian commercial Banks. Quantitative research design is employed under the quantitative research design survey method is used. The data were collected by cross sectional survey method. The estimation results showed that result of return on asset (ROA) on the regression shows that non-performing loan and loan provision of the financial institution is significantly negatively related to performance.

On the other hand, Agegnehu (2011) describes credit risk management and performance of Ethiopian commercial banks. This study attempts to reveal the relationship between credit risk and performance of commercial banks in Ethiopia. In order to investigate these issues quantitative research approach is utilized based on documentary analysis. A panel data from seven selected commercial banks covering the eleven-year period (2001-2011) is analyzed within the fixed effects framework. The findings of the study showed that Non-performing loan had statistically significant negative relationship with ROA.

In addition, Hailu (2016) in their study investigated the impact of credit risk on profitability performance of selected public and private commercial banks of Ethiopia. Used secondary data from annual reports of the selected public and private commercial banks of Ethiopia showed that there is a negative relationship between credit risk and performance of commercial banks in Ethiopia.

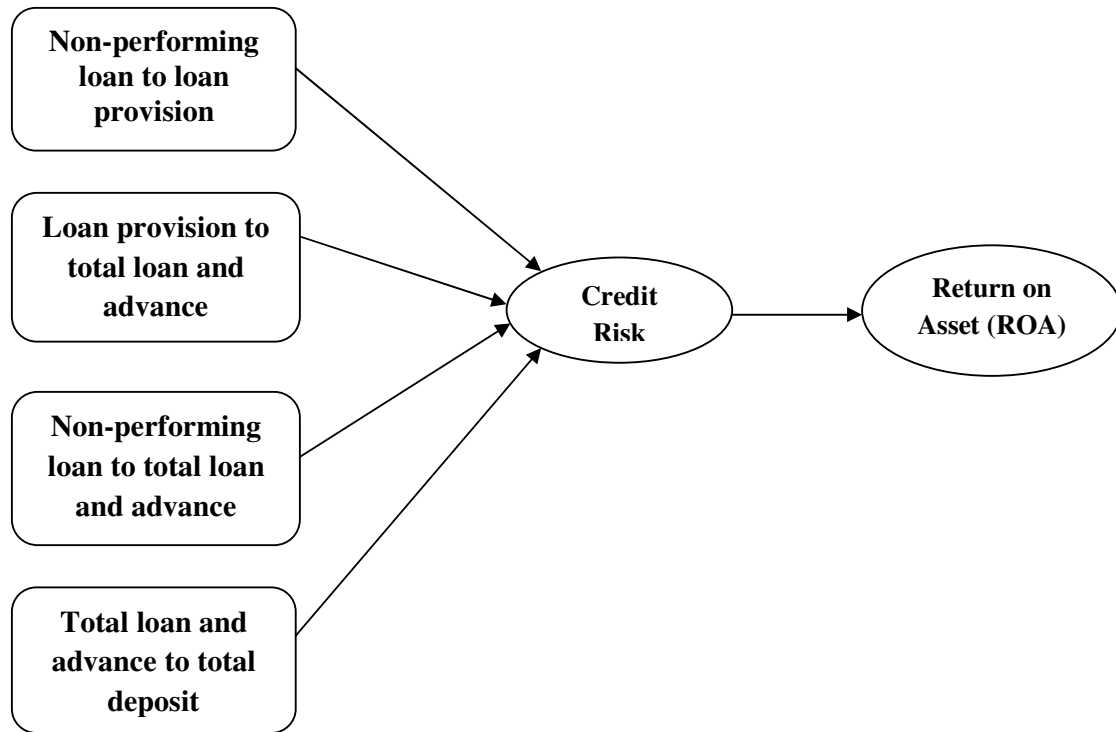
2.4. Literature gap

Empirical studies were conducted on effect of credit risk in performance of commercial banks in Ethiopia by Girma (2011), Tibebu (2011) and Agegnehu (2013). However, in their studies only selected sample that big size (CBE) and medium sized commercial banks as a sample. Hence, it failed to disclose the literature gap by incorporating those small sized commercial banks in their samples. Therefore, this study incorporated those small sized commercial banks and tried to disclose the gap. The purpose of this study is to investigate credit risk management practice and its effect on performance of Ethiopian commercial banks. The study will contribute a lot for both public and private commercial banks credit management department and policy makers in order to identified and mitigated the bank credit risk factors and in turn to improve its performance.

2.5. Conceptual Framework

The main objective of this study is to examine the effect of Credit risk on financial performance of commercial banks in Ethiopia. Based on the objective of the study, the following conceptual model is framed. As it described previously in the related literature review parts, bank performance measured by Return on asset can be affected by credit risk proxy variables of Non-Performing Loan to Total Loan and Advance (NPLTLA), Non-Performing Loan to Loan Provision (NPLLP), Loan Provision to Total Loan and Advance (LPTLA) and Total Loan and Advance to Total Deposit (TLATD).

Thus, the following conceptual model is framed to summarize the main focus and scope of this study in terms of variables included.



CHAPTER THREE

3. RESEARCH METHODOLOGY

This chapter highlights about the research methodology of the study and comprises research approach, research design, target population and sampling unit, sampling design and sample size, data analysis, model specification, validity and Ethical consideration sections.

3.1. Research Approach

The aim of this research is to investigate the effect of credit risk on financial performance of commercial banks in Ethiopia. Therefore, in order to achieve the aforementioned objective the researcher employed quantitative research approach.

3.2. Research design

According Durrheim (2004) research design is a strategic framework for action that serves as a bridge between research questions and the execution, or implementation of the research strategy. Thus, in order to answer the research questions casual research design used. The purpose of this study is to investigate the effect of credit risk on financial performance of commercial banks in Ethiopia in so doing, casual research design has adopt in collecting, analyzing and interpreting data to address the objective(s) of the study.

3.3 Data Type and Source

In this study the researcher has employed quantitative research approach. Only secondary data are used for the study. The secondary data was collected from the financial statements of the selected banks. From those banks, the study obtained data by considering the proxy credit risk indicators of Non-Performing Loan to Loan Provision, Loan Provision to Total Loan and Advances, Non-Performing Loan to Total Loan and Advance, and Total Loan and Advance to Total Deposit and performance proxy indicators of ROA of the period covered from 2007 to 2016 G.C.

3.4 Target commercial banks selection criteria and technique

Currently in Ethiopia seventeen commercial banks are in operation. According to NBE based on their paid up capital commercial banks can be classified in to three categories that is big size, medium size and small size. Big size consists of Commercial bank of Ethiopia, Medium

size consists of Awash Bank, Dashen Bank, United Bank, Bank of Abyssinia, Wogagen Bank and Nib International Bank and Small size consists of Cooperative Bank of Oromia, Lion International Bank, Buna International bank, Oromia International Bank, Abay Bank, Enat Bank, Birhan Bank, Zemen Bank, Addis International Bank and Dehub Global Bank. Therefore, the researcher classified in to three stratum, from those the researcher used six commercial banks as a sample namely Commercial bank of Ethiopia, Awash Bank, Dashen Bank, United Bank, Corporate Bank of Oromia and Lion International Bank which is one big size, three medium sizes and two small sizes by using purposive sampling technique in terms of their capital from each stratum and based on their loan portfolio. Purposive sampling targets a particular group of people.

3.5. Method of data Analysis

To achieve objective of the study, the study mainly concentrated on quantitative analysis. Hence, the researcher used econometric model to identify and measure the effect of credit risk on financial performance of Ethiopian commercial banks and used Ordinary Least Square (OLS) method using Eviews-8 econometric software package for the study. According to Brooks (2008) regression is concerned with describing and evaluating the relationship between a given variable (usually called the dependent variable) and one or more other variables (usually known as the independent variables. Thus, the study adopted panel data regression model to examine the effect of credit risk on financial performance of commercial banks in Ethiopia.

As stated by Brooks (2008) panel data is favoured for situation often arises in financial modelling where we have data comprising both time series and cross-sectional elements. In addition, we can address a broader range of issues and tackle more complex problems with panel data than would be possible with pure time-series or pure cross-sectional data alone. Accordingly, the study model focused on panel data technique that comprises both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the different Ethiopian commercial banks (six) and the time-series element is revealed by the period of study (2007-2016). Therefore, the collected panel data is analyzed using descriptive statistics, correlations and multiple linear regression analysis. The rationale for choosing Ordinary Least Square (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).

Diagnostic checking is done to test whether the sample is consistent with the following assumptions. According to Brooks (2008), the assumptions of ordinary least squares are:

- I. The errors have zero mean ($E(u_t) = 0$)
- II. Variance of the errors is constant ($\text{Var}(u_t) = \sigma^2 < \infty$)
- III. Covariance between the error terms over time is zero ($\text{cov}(u_i, u_j) = 0$ for $i \neq j$)
- IV. Test for Normality ($u_t \sim N(0, \sigma^2)$)
- V. Multicollinearity Test

If all the above assumptions are consistent with the sample, E-view result will be accurate and reliable. The following tests are done in this research to test the above assumptions.

I. The errors have zero mean ($E(u_t) = 0$)

Relay on Brooks (2008), the first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated.

II. Variance of the errors is constant ($\text{Var}(u_t) = \sigma^2 < \infty$) (heteroscedasticity)

According to Brooks (2008), the variance of the errors is constant this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroscedastic. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer Test, Breusch-Pagan-Goldfrey Test, White's Test and Autoregressive Conditional Heteroscedasticity (ARCH) test. In this study, the popular white test was employed to test for the presence of heteroscedasticity.

III. Covariance between the error terms over time is zero ($\text{cov}(u_i, u_j) = 0$ for $i \neq j$) (Autocorrelation)

According to Brooks (2008), when the error term for any observation is related to the error term of other observation, it indicates that autocorrelation problem exist in this model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient. The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated or overestimated. Due to the invalid hypothesis testing, it may lead to misleading results on the significance of

parameters in the model. Therefore, the study test for the existence of autocorrelation, the popular Durbin–Watson test and Breusch-Godfrey test were employed.

VI. Normality (ut ~N(0, σ2)

As per Brooks (2008) normality tests are used to determine if a data set is well-modeled by a normal distribution. With the normality assumption, ordinary least square estimation can be easily derived and would be much more valid and straight forward. This study used Jarque Bera Test (JB test) to find out whether the error term is normally distributed or not.

IV. Multicollinearity

According to Brooks (2008), Multicollinearity will occur when some or all of the independent variables are highly correlated with one another. If the multicollinearity occurs, the regression model is unable to tell which independent variables are influencing the dependent variable. This study used high pair-wise correlation coefficients method to test the presence of multicollinearity problem in a regression model, because it shows the correlation of independent variables between each other one by one. Malhotra (2007) stated that multicollinearity problems exists when the correlation coefficient among explanatory variables should be greater than 0.75. However, Brooks (2008) mentioned that if the correlation coefficient along with the independent variables is 0.8 and above, multicollinearity problems will be existed.

3.6. Model Specification

To investigate the effect of credit risk on financial performance of commercial banks in Ethiopia following general multiple linear regression models used:

$$Y_i = \beta_0 + \beta X_i + \mu_i \dots\dots\dots (1)$$

Where:

Y_i –Dependent Variable

β_0 - Constant term,

X_i - Explanatory or independent Variables

μ_i - Disturbance term

Hence, based on the above general multiple linear regression models and on the basis of selected variables for the study the specific empirical model presented as follows:

$$\text{ROA} = f(\text{NPLTLA}, \text{LPTLA}, \text{NPLLP}, \text{TLATD})$$

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Where: Y= Return on Asset (dependent variable) - performance measure

Proxy credit risk indicators

X1= Non-Performing Loan to Total Loan and Advances

X2= Loan Provision to Total Loan and Advance

X3= Non-Performing Loan to Loan Provision

X4= Total Loan and Advance to Total Deposit

μ = disturbance term

Also α is an intercept and β is the parameter of explanatory variable and it measures by what amount the dependent variable (ROA) increases or decreases when the specific explanatory variables increases or decreases by a unit.

3.6.1. Variables description

In this section explained the variables used as dependent and independent (explanatory) variables in the study. The definitions and measurements that are used for these variables are described and accordingly with the help of empirical data hypothesis developed as follows:

Dependent Variable

Return on Asset (ROA)

Prior works on credit risk management and bank performance indicated that Return on assets (ROA) was an important measurement used in comparing the financial performance of banks (Girma, 2011; Agegnehu, 2013). It is defined as Profit after Tax divided by Total Asset; reflect how well bank managers are using the banks real investment resource to generate profit. It shows the profit earned per dollar of assets and most importantly, reflects the management ability to utilize the bank's financial and real investment resources to generate profits. For any bank, ROA depends on the bank's policy decisions as well as uncontrollable factors relating to the economy and government regulations. Many regulators believe return on assets is the best measure of bank efficiency from the two major alternative measures of profitability, namely ROA and ROE. As highlighted by Athanasoglou et al. (2008) and

Sufian (2011), many scholars suggest that ROA is the key ratio for the evaluation of bank performance given that ROA is not distorted by high equity multipliers, while ROE disregards the risks associated with high leverage and financial leverage.

Independent Variables

Non-Performing Loan to Loan Provision

NPLLP: is a loan that is in default or close to being in default out of loan provision in future or become slow-paying. The ratio of non-performing loan to loan provision (NPLLP) used as a measure for credit risk. The ratio of non-performing loan to loan provision, which measures how much a bank is suffer default in year relative to its reserved loan provision, is used to measure the effect of non-performing loans to loan provision on performance of commercial banks in Ethiopia.

Loan provision to Total loan and advance

LPTLA; first 'Loan Loss Provision' is a non-cash expense for banks to account for future losses on loan defaults. Banks assume that a certain percentage of loans will default or become slow-paying. Banks enter a percentage as an expense when calculating their pre-tax incomes. This guarantees a bank's solvency and capitalization if and when the defaults occur. The ratio of Loan Provision to Total loan and Advance (LP/TLA) used as a measure for credit risk. It indicates banks' ability to generate income before the expectation of default occurs (Agegnehu, 2013).

Non-performing loan to Total loan and advances

NPLTLA is a loan that is in default or close to being in default. Many loans become non-performing after being in default for 90 days, but this can depend on the contract terms. NPL amount has been presented using different names, such as, impaired loans, problem loans, doubtful claims and loan allowances. However, the definitions of those are similar to the definition of NPLs. NPL amount is provided in the Notes to financial statements under Loans section. Total Loan (TL) amount, is the denominator of the ratio, has been gathered by adding two types of loans: loans to institutions and loans to the public. The researcher has collected the non-performing loan amount provided in off balance sheet of the banks that is submitted to NBE from 2007 until 2016.

Total loan and advance to Total Deposit

TLATD; the formula for the loan to deposit ratio is exactly as its name implies, total loans and advance divided by total deposits. A lending institution that accepts deposits must have a certain measure of liquidity to maintain its normal daily operations. Loans given to its customers are mostly not considered liquid meaning that they are investments over a longer period of time. Although a bank will keep a certain level of mandatory reserves, they may also choose to keep a percentage of their non-lending investing in short term securities to ensure that any money needed can be accessed in the short term. The ratio of Total loan & Advances to Total deposit (TLA/TD) is used as indicators of credit risk. For banks, it is how much they have coming in (deposits) vs how much they have going out (loans). The more money the bank has loaned out generates more interest income provided the loans are to secure borrowers. Deposits are an obligation (debts) of the bank has to the depositors. So, a healthy bank has lots of secure loans generating lots of income (interest) to cover depositor's accounts.

CHAPTER FOUR

4. DATA ANALYSIS AND DISCUSSION OF RESULT

As the researcher discussed in the previous chapters the major objective of this study is to investigate the effect of credit risk on financial performance of Ethiopian commercial banks. Therefore, this chapter deals with the results and analysis of the findings and it contains three sections. The first section presented descriptive and correlation analysis on variables of the study; the second section presented fulfillment of the classical linear regression model (CLRM) assumptions; the third section laid down the results of regression.

The data analysis procedures used for ratio scale measurement and the ratio of the specified dependent and independent variables were calculated for further statistical analysis. The collected data was analyzed by the aid of the statistical software Eview8.

4.1 Descriptive statistics

This section presents the descriptive statistics of dependent and explanatory variables used in this study. The dependent variable used in this study was ROA, while the explanatory variables are NPLTLA, NPLLP, LPTLA and TLATD. Table 4.1 Summary of Descriptive Statistics of dependent and independent variables for six commercial banks over the sample period of 2007 - 2016 with a total of 60 observations. The table shows the mean, minimum, maximum, standard deviation and number of observations for the dependent variable and independent variables of firms' performance.

Table 4.1 Descriptive statistics

	ROA	NPLLP	LPTLA	NPLTLA	TLATD
Mean	0.025790	0.646007	0.030677	0.026548	0.577008
Median	0.027515	0.644215	0.021800	0.020400	0.563130
Maximum	0.044700	0.975500	0.315350	0.198540	0.901820
Minimum	-0.018800	0.121490	0.002440	0.002742	0.297430
Std. Dev.	0.010317	0.208977	0.042687	0.029111	0.133128

Source: - annual report of sample commercial banks computed using E-views 8

As indicated in the table 4.1, the firms' performance measured by return on asset shows that sampled of Ethiopian commercial banks achieved 2.579% on average after tax profit over the last ten years from 2007 to 2016. From the total sample, return on asset had a maximum of 4.47% and minimum of -1.88%. It means that the most profitable commercial banks among the sampled earned 4.47 cents of profit after tax for a single birr (1.00) invested in the assets of the firm. On the other hand, not profitable commercial banks of the sampled lost -1.88 cents of profit after tax for each birr (1.00) invested in the assets of the firm and the value of return on asset deviate from its mean by 1.03%.

The average value for non-performing loan to loan provision as measured by ratio of commercial banks was 64.60% with a maximum of 97.55% and a minimum of 12.15%. It implies that there is large amount of non-performing which tends to have default risk. On the other hand, sampled of Ethiopian commercial banks who have excess uncollected amount has average 0.64 cents from the reserved loan provision birr (1.00) and the value of non-performing loan to loan provision deviate from its mean by 20.89%.

On the other hand, the loan provision to total loan and advance ratio indicated by the range between 31.53% and 0.24%. The mean value is equals 3.06 %. The relatively high range between the minimum and maximum value implies that the most efficient bank has a profitable capability compared to the least efficient bank. The standard deviation statistics for loan provision to total loan and advance ratio was 4.26% which indicates that the written amount of loan loss variation between the selected banks was medium.

The average value of Non-performing loan to total loan advance rate equals 2.54% with a maximum of 19.85% and its minimum value was 0.27%. The standard deviation statistics for NPLR is 2.91%. This means despite the inverse relationship that exists between non-performing loan and performance and the value of non-performing loan to total loan and advance deviate from its mean by 2.91%.

Finally, the average value of the total loan to deposit was 57.70% with a minimum 29.74% and maximum of 90.18%. The standard deviation statics for this was 13.31%. This shows the existence relatively high variation of loan to deposit ratio between the selected banks compared with the variation in ROA.

4.2 Correlation Analysis

Correlation measures the degree of linear association between variables. Values of the correlation coefficient are always ranged between +1 and -1. A correlation coefficient of +1 indicates that the existence of a perfect positive association between the two variables, while a correlation coefficient of -1 indicates perfect negative association. A correlation coefficient of zero, on the other hand, indicates the absence of relationship (association) between two variables (Brooks, 2008). The table below shows the correlation matrix among dependent and independent variables.

Table 4.2 Correlation Analysis of Variables

	ROA	NPLLP	LPTLA	NPLTLA	TLATD
ROA	1.000000	-0.227633	-0.330013	-0.283095	0.267086
NPLLP	-0.227633	1.000000	0.187480	-0.338694	0.091506
LPTLA	-0.330013	0.187480	1.000000	-0.106438	0.029683
NPLTLA	-0.283095	-0.338694	-0.106438	1.000000	-0.047537
TLATD	0.267086	0.091506	0.029683	-0.047537	1.000000

Source: - annual report of sample commercial banks computed using E-views 8

The results in table 4.2 revealed that a correlation between dependent variables with independent variables. According to the result non-performing loan to loan provision, loan provision to total loan and advance and non-performing loan to total loan and advance have negative correlation with return on asset and total loan and advance to total deposit have positive correlation with return on asset for measurement of Ethiopian commercial banks' performance. It refers that when non-performing loan to loan provision, loan provision to total loan and advance and non-performing loan to total loan and advance variables increases, performance of Ethiopian commercial banks will be go down and when total loan and advance to total deposit increases, performance of Ethiopian commercial banks will be go up.

The coefficient estimates of correlation in the above table shows -0.227633, -0.330013, -0.283095 and 0.267086 for loan provision to non-performing loan, loan provision to total loan and advance, non-performing loan to total loan and advance and total loan and advance to total deposit respectively. This implies that non-performing loan to loan provision, loan

provision to total loan and advance and non-performing loan to total loan and advance are negatively correlated with return on asset and total loan and advance to total deposit are positively correlated with return on asset.

4.3 Regression model tests

For valid hypothesis testing and to make data available for reliable results, the test of assumption of regression model is required. Accordingly, the study has gone through the most critical regression diagnostic tests consisting of model specification tests, heteroskedasticity, autocorrelation, normality and multicollinearity test accordingly.

4.3.1 Model Selection (Random Effect versus Fixed Effect Models)

As Brooks (2008) referring on his book, there are broadly two classes of panel estimator approaches that can be employed in financial research: fixed effects models and random effects models. The choice between both approaches is done by running a Hausman test. To conduct a Hausman test the number of cross section should be greater than the number of coefficients to be estimated. In this study the numbers of cross section are greater than the number of coefficients to be estimated so it is possible to conduct a Hausman test. Therefore a fixed cross-sectional effect is specified in the estimation to capture the effects of different commercial banks.

Table 4.3 Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. statistic	Chi-Sq. d. f.	Prob.
Cross-section random	13.831540	4	0.0079

Source: - annual report of sample commercial banks computed using E-views 8.

The Hausman model selection test for this study has a p-value of 0.0079 for the regression models. On this score, fixed effect model is preferable. Therefore, the study has 10 time series and 6 cross sectional which is relevant to fixed effect model.

According to Brooks (2008) it is often said that the random effects model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the

population, but a fixed effect model is more reasonable when the entities in the sample effectively represent the entire population. Thus, the sample for this study was not selected randomly instead it selected rationally that can effectively represent the total number of population, due to this it is appropriate for fixed effect model selection.

4.3.2. Tests for the Classical Linear Regression Model (CLRM) assumptions

To maintain the data validity and robustness of the regressed result of the research, the basic classical linear regression model (CLRM) assumptions must be tested for identifying any misspecification and correcting them so as to augment the research quality (Brooks,2008). There are different CLRM assumptions that need to be satisfied and that are tested in this study, which are: errors equal zero mean test, model specification, heteroskedasticity, autocorrelation, normality and multicollinearity test.

I. The errors have zero mean ($E(u_t) = 0$)

This part shows the test for the assumptions of classical linear regression model (CLRM) namely the error have zero mean, heteroscedasticity, autocorrelation, normality and multicollinearity. Relay on Brooks (2008), the first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. Hence, study's regression model has included a constant term, so that this assumption was not violated.

II. Test for heteroskedasticity assumption ($\text{var}(u_t) = \sigma^2 < \infty$)

As indicated by Brooks (2008), this assumption requires that the variance of the errors to be constant. If the errors do not have a constant variance, it is said that the assumption of homoscedasticity has been violated. This violation is termed as heteroscedasticity. In this study test was used to test for existence of heteroscedasticity across the range of explanatory variables.

Table 4.4 Heteroskedasticity Test

Heteroskedasticity Test: White

F-statistic	1.240639	Prob. F(5,54)	0.3031
Obs*R-squared	6.182260	Prob. Chi-Square(5)	0.2889
Scaled explained SS	5.569338	Prob. Chi-Square(5)	0.3504

Source: - annual report of sample commercial banks computed using E-views 8

In this case, both the F- statistic and R-squared versions of the test statistic give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values are considerably in excess of 0.05 and also the third version of the test statistic, ‘Scaled explained SS’, which as the name suggests is based on a normalized version of the explained sum of squares from the auxiliary regression, suggests also that there is no evidence of heteroscedasticity. Thus, there is no evidence of heteroscedasticity. Thus, the conclusion of the test has shown that no evidence of heteroscedasticity.

III. Test for autocorrelation assumption ($\text{cov}(u_i, u_j) = 0$ for $i \neq j$)

This assumption stated that the covariance between the error terms over time (or cross sectionals, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlated or that they are serially correlated (Brooks, 2008).

The Durbin-Watson test statistic of 1.617 is close to two, so that there is no evidence for the presence of autocorrelation.

Another test for the existence of autocorrelation is by using Breusch-Godfrey test.

Table 4.5 Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.341503	Prob. F(2,52)	0.1062
Obs*R-squared	4.957047	Prob. Chi-Square(2)	0.0839

Source: - annual report of sample commercial banks computed using E-views 8

Both versions of the test; F- statistic and R-squared version of the test indicate that the null hypothesis of no autocorrelation should not be rejected, since the p-values are considerably in

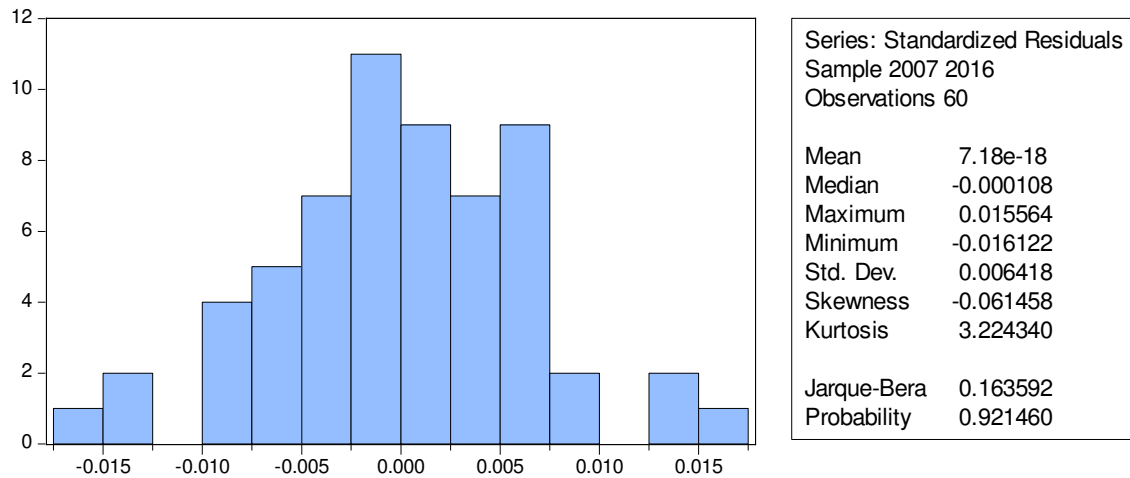
excess of 0.05. The conclusion from both versions of the test described that there is no autocorrelation.

IV. Test of normality ($ut \sim N(0, \sigma^2)$)

As stated by Brooks (2008), if the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would be significant. This means that JarqueBera formalizes this by testing the residuals for normality and testing whether the coefficient of skewness and kurtosis are ≈ 0 and ≈ 3 respectively. Normality assumption of the regression model can be tested with the Jarque- Bera measure. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how it is fat the tails of the distribution. If the JarqueBera value is greater than 0.05, it's an indicator for the presence of normality (Brooks, 2008).

In addition, it is quite often the case that one very extreme residuals cause a rejection of the normality assumption. Such observations would appear in the tails of the distribution, which enters into the definition of kurtosis, to be very large. Such observations that do not fit in with the pattern of the remainder of the data are known as outliers. If this is the case, one way to improve the chances of error normality is to use dummy variables (Brooks, 2008). In line with this, the study included one dummy variable (DUM608) to adjust the normality distribution. Thus, the figure 4.1 shows the result of normality by including one dummy variable.

Figure 4.1 Normality Test Result



Source: - annual report of sample commercial banks computed using E-views 8

The above diagram witnesses that normality assumption holds, i.e., the coefficient of kurtosis was close to 3, skewness was close to zero and the Bera-Jarque statistic has a P-value of 0.921460 implying that the data were consistent with a normal distribution assumption.

V. Test for multicollinearity

As referred by Brooks (2008), an implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as multicollinearity. Malhotra (2007) stated that multicollinearity problems exists when the correlation coefficient among explanatory variables should be greater than 0.75. However, Brooks (2008) mentioned that if the correlation coefficient along with the independent variables is 0.8 and above, multicollinearity problems will be existed.

Table 4.6 Correlation Matrix between independent variables

	NPLLP	LPTLA	NPLTLA	TLATD
NPLLP	1			
LPTLA	0.187480	1		
NPLTLA	-0.338694	-0.106438	1	
TLATD	0.091506	0.029683	-0.047537	1

Source: - annual report of sample commercial banks computed using E-views 8

The method used in this study to test the existence of multicollinearity was by checking the Pearson correlation between the independent variables. The correlations between the independent variables are shown in table 4.6 above. All correlation results are below 0.75, which indicates that multicollinearity is not a problem for this study.

4.4 Analysis of regression

This section presents the empirical findings from the econometric output results on effect of credit risk on commercial banks performance in Ethiopia. Table 4.7 below shows regression results between the dependent variable (ROA) and explanatory variables. Under the following regression outputs the beta coefficient may be negative or positive; beta indicates that each variable's level of influence on the dependent variable

Regression result

Empirical model: The empirical model used in the study in order to indentify the effect of credit risk on commercial banks financial performance:-

$$ROA = \beta_0 + \beta_1 NPLLP + \beta_2 LPTLA + \beta_3 NPLTLA + \beta_4 TLATD + \varepsilon$$

Table 4.9 Regression result

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/05/18 Time: 01:06

Sample: 2007 2016

Periods included: 10

Cross-sections included: 6

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.029195	0.005033	5.800643	0.0000
NPLLP	-0.012455	0.004674	-2.664748	0.0104
LPTLA	-0.100671	0.020471	-4.917701	0.0000
NPLTLA	-0.071777	0.031487	-2.279591	0.0270
TLATD	0.017800	0.006634	2.683401	0.0099
DUM607	-0.038167	0.006881	-5.546418	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.700112	Mean dependent var		0.025790
Adjusted R-squared	0.638910	S.D. dependent var		0.010317
S.E. of regression	0.006199	Akaike info criterion		-7.164576
Sum squared resid	0.001883	Schwarz criterion		-6.780613
Log likelihood	225.9373	Hannan-Quinn criter.		-7.014387
F-statistic	11.43942	Durbin-Watson stat		1.616724
Prob(F-statistic)	0.000000			

Source: - annual report of sample commercial banks computed using E-views 8

This section discusses in detail the analysis of the results for each explanatory variable and their effect on Ethiopian commercial banks performance. Furthermore, the discussion analyzed the statistical findings of the study in relation to the previous empirical evidences. Hence, the following discussions present the interpretation on the fixed effects model regression results.

P-value indicates at what percentage or precession level of each variable is significant. The R-squared value measures how well the regression model explains the actual variations in the dependent variable (Brooks, 2008). R-squared statistics and the adjusted- R squared statistics of the model was 70.01% and 63.89% respectively. The adjusted R-squared value 63.89% indicates that the dependent variable of return on asset (ROA) of Ethiopian commercial banks is well explained by the independent variables that are listed in the model. Thus, these variables collectively are good explanatory variables to identify the effect of credit risks on commercial bank financial performance in Ethiopia. The regression F-statistic (11.43942) and the p-value of zero attached to the test statistic reveal that the null hypothesis that all of the coefficients are jointly zero should be rejected. Thus, it implies that the independent variables in the model were able to explain variations in the dependent variable. The coefficient for NPLLP is -0.012455 on ROA which indicates that the non-performing loan to loan provision of the commercial banks had negative relationship with ROA and also the relationship is significant at 5% level of significant. And also, the coefficient for LPTLA is -0.100671 on ROA which refers that non-performing loan to total loan and advance had negative and significant relation with ROA at 1% level of significant. Next, the coefficient for NPLTLA is of -0.071777 had negative and significant relation with ROA at 5% level of significant respectively.

However, TLATD is 0.017800 on ROA, which implies that TLATD had positive relation with ROA but it is significant at 1% level of significant. The negative relationships indicate that there is an inverse relationship between the explanatory variables and ROA. Thus, increasing of those variables will lead to a decrease in ROA of Ethiopian commercial banks. On the other hand the positive relationships indicate that there is a direct relationship between the remaining one independent variables and ROA. Decreasing of this variable will led to a decline in ROA Ethiopian commercial banks.

4.4.1 Discussion of results

Non-performing loan to Loan provision

H1: non-performing loan to loan provision has negative and statistically significant effect on Ethiopia commercial banks performance.

According to the regression result of non-performing loan to loan provision (NPLLP) has a negative relationship with Ethiopian commercial banks performance by a coefficient estimate of -0.012455. This means that holding other independent variables constant and when one percent increases in non-performing loan to loan provision, consequently it reduces return on asset (ROA) of Ethiopian commercial banks by 1.24% and the p value of non-performing loan to loan provision (NPLLP) is 0.0104 reveals that it is statistically significant at 5% level of significance. Accordingly, the result supports the working hypothesis that non-performing loan to loan provision has negative and statistically significant effect on performance of commercial banks in Ethiopia for the period of 2007 to 2016. Thus, this outcome is consistent with prior study of Girma (2011) that point out the negative significant effect of non-performing loan to loan provision on performance.

As implied from the above finding, non-performing loan to loan provision is adversely affecting the performance of the commercial banks during the study period in Ethiopia. Hence, the possible reason is associated with the non-performing loan, customers who is likely fail to pay their debt to the commercial banks on due date.

Loan Provision to Total Loan and Advance

H2: loan provision to total loan and advance has negative and statistically significant effect on Ethiopia commercial banks performance

The results of fixed effect model table 4.9 indicated that the relationship between loan provision to total loan and advance has a negative relationship with Ethiopian commercial banks performance by a coefficient estimate of -0.100671. This means that holding other independent variables constant and when one percent increases in total loan and advance to total deposit, as a result it decreases return on asset (ROA) of Ethiopian commercial banks by 10.06% and the p value of loan provision to total loan and advance is 0.0000 discloses that it is statistically significant at 1% level of significance

Hence, this significant negative relationship between loan provision and ROA similar to with the fact which suggest that firms income before excluding provision also affect performance

of commercial banks. This finding is not consistent with the literatures Girma (2011). In the case of Girma (2011) its negative relationship with ROA and is not statically significant at 5% level of significance.

Non-Performing Loan to Total Loan and Advance

H3: Non-performing loan to total loan and advance has negative and statistically significant effect on Ethiopia commercial banks performance.

The ratio of non-performing loan to total loan and advance, which measures how much a bank is suffer default in year relative to its gross loan disbursed, is used to measure the effect of non-performing loans on performance of commercial banks in Ethiopia. According to the regression result of non-performing loan to total loan and Advance (NPLTLA) has a negative relationship with Ethiopian commercial banks performance by a coefficient estimate of - 0.071777. This means that holding other independent variables constant and when one percent increases in non-performing loan to total loan and Advance, consequently it decreases return on asset (ROA) of Ethiopian commercial banks by 7.17% and the p value of NPLTLA is 0.0270 shows that it is statistically significant at 5% level of significance. Accordingly, the result supported the working hypothesis that non-performing loan to total loan and Advance has negative and statistically significant effect on performance of commercial banks in Ethiopia for the period of 2007 to 2016. This result shows that, high NPL increase the level of default rate and reduces the performance of commercial banks in Ethiopia. Hence, the possible reason is that the borrowers fail to pay the loan. This finding is consistent with the literatures Girma (2011) and Agegnehu (2013) both concluded that there is a negative relationship between non-performing loan to total loan and advance and performance of commercial banks in Ethiopia

Total Loan and Advance to Total Deposit

H4: Total loan and advance to total deposit has positive and statistically significant effect on Ethiopia commercial banks performance.

In accordance with the regression result of total loan and advance to total deposit (TLATD) has a positive relationship with Ethiopian commercial banks performance by a coefficient estimate of 0.017800. This means that holding other independent variables constant and when one percent increases in total loan and advance to total deposit, as a result it increase return

on asset (ROA) of Ethiopian commercial banks by 1.798 and the p value of TLATD is 0.0099 discloses that it is statistically significant at 1% level of significance and the result supported the working hypothesis that Total loan and advance to total deposit has positive and statistically significant effect on Ethiopia commercial banks performance for the period of 2007 to 2016. Hence, this is the result of the interest rate difference between what the banks charging on loan and what they actually paying on the deposits. Thus, this outcome is consistent with prior study of Agegnehu (2013), concluded that there is a positive relationship between total loan and advance to total deposit and performance of commercial banks in Ethiopia

Generally this chapter discussed the results of the analysis and then presented the discussions of these results using the appropriate method. Accordingly, the chapter discussed the descriptive analysis, correlations between the variables and through the regressions analyses; it illustrates how the independent variables influence the dependent variable. Thus, a discussion of the result indicates that non-performing loan, total loan and advance and provision profit were statistically significant credit risk factors that determine the performance of banks in Ethiopia. The next chapter presents conclusions and recommendations of the study.

CHAPTER FIVE

1. SUMMARY, CONCLUSION AND RECOMMENDATION

The preceding chapter presented the results and discussion, while this chapter deals with summary, conclusion and recommendations based on the findings of the study. Accordingly this, chapter is organized into three subsections.

5.1 Summary of findings

The research general objective was to examine the effect of credit risk on financial performance of commercial banks in Ethiopia. The study used ten (10) years period of time from 2007-2016 data from six (6) selected commercial banks in Ethiopia. It carried out by constructing a balanced panel regression model using OLS and as per the Hausman test, fixed effect model was adopted for secondary data obtained from audited annual report.

The overall result obtained from the regression model indicates that credit risk has an effect on performance of commercial banks in Ethiopia. The dependent variable used to measure commercial banks performance was return on asset and independent variables these are non-performing loan to total loan and advance, loan provision to total loan and advance, non-performing loan to loan provision and total loan and advance to total deposit in order to attain the objective of the study.

From the regression result, non-performing loan to total loan and advance, loan provision to total loan and advance and non-performing loan to loan provision had negative and significant effect on Ethiopian commercial banks performance. However, total loan and advance to total deposit had positive and significant effect on Ethiopian commercial banks performance.

5.2 Conclusions

This study aimed to identify the relationship between credit risk and financial performance of Ethiopian banks. In doing so, previous studies on credit risk have been reviewed and it is summarized that the performance of bank is usually affected by non-performing and total loan. Both are originated from bank accounts (balance sheets and/or profit and loss accounts) and therefore could be termed micro or bank-specific factors for performance included in asset quality.

To achieve the intended objectives the study has employed quantitative research approach. The data were collected purposively from a sample of six banks over the time period from 2007-2016. The collected data were analyzed by employing fixed effect model using econometrics software E-view8.

In order to conduct the empirical analysis, one dependent variable and four independent variables were selected from prominent previous research works namely non-performing loan to total loan and advance ratio, total loan and advance to total deposit ratio, non-performing loan to loan provision ratio and loan provision to total loan and advance ratio. The results of the fixed effect estimation model showed the existence of the relationship between performance and four independent variables.

The findings of the study on the effect of credit on financial performance of commercial banks in Ethiopia for the sample suggest the following conclusions.

According to the regression results, the findings indicated that bank credit risk measured in terms of Non-performing loan to total loan and advance had statistically significant negative relationship with ROA, which was in line with previous studies. A negative sign suggests that banks with high default rate affect performance negatively.

On the other side, the findings indicated that bank credit risk measured in terms of loan to deposit ratio of banks in this study, the result shows that as there was positive and statistically significant relationship with ROA. This implies that bank charge more than what the bank incurring as interest expense for the depositors and the more loan the bank give will have a significant effect on banks profitability

Next, the findings indicated that bank credit risk measured in terms of non-performing loan to loan provision shows that negative and statistically significant relationship with ROA. This implies that the borrower failed to pay.

Finally, the result showed a negative relationship between loan provision to total loan and advance and performance with statistical significance. This implies that commercial banks income before excluding provision also affects performance of commercial banks.

Generally, the study has developed four hypotheses. Accordingly, all hypotheses of the credit risk variables were significantly related with bank performance. Therefore, all variables are accepted and this particular study concludes that most bank financial performances are affected by credit risk factors.

5.3 Recommendation

In light of the major finding obtained from the results, the following recommendations are made.

Banks non-performing loan to total loan and advance ratio, ratio of loan Provision to total loan and advance, ratio of non-performing loan to loan provision and ratio of total loan & advances to total deposit are significant key credit risk drivers of performance of commercial banks in Ethiopia.

Therefore, banks should pay greater attention to these significant variables in determining their credit risk management policy. By establishing standards and overall objectives to reduce the level of credit exposures

The study also shows that, performance of banks in Ethiopia mainly negatively influenced by non-performing loan and loan provision. Therefore, it is recommendable for banks need for strong credit risk and loan service process management must be adopted to keep the level of non-performing loan and loan provision as low as possible which will enable to maintain high performance of commercial banks in Ethiopia.

Finally, by improving the loan to deposit ratio the bank should maximize the profit. In addition the loan also should be given up to some stage where the liquidity risk does not exist.

5.4 Further Research Consideration

This study only considered the effect of credit risk on financial performance of commercial banks in Ethiopia. However, it is recommendable for potential researchers to further assess other factors of credit risk that can affect firm's performance by incorporating additional bank specific, macro-economic factors and qualitative data.

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APPENDICES

Appendix 1:-Descriptive Analysis

	ROA	NPLLP	LPTLA	NPLTLA	TLATD
Mean	0.025790	0.646007	0.030677	0.026548	0.577008
Median	0.027515	0.644215	0.021800	0.020400	0.563130
Maximum	0.044700	0.975500	0.315350	0.198540	0.901820
Minimum	-0.0188	0.121490	0.002440	0.002742	0.297430
Std. Dev.	0.010317	0.208977	0.042687	0.029111	0.133128
Skewness	-1.773881	-0.304644	5.379252	4.081153	0.575580
Kurtosis	7.897890	2.454215	34.94681	22.84512	3.031872
Jarque-Bera	91.43987	1.672780	2840.861	1151.130	3.315459
Probability	0.000000	0.433272	0.000000	0.000000	0.190571
Sum	1.547414	38.76039	1.840592	1.592891	34.62045
Sum Sq. Dev.	0.006280	2.576616	0.107510	0.050001	1.045667
Observations	60	60	60	60	60

Appendix 2:- Correlation Analysis

	ROA	NPLLP	LPTLA	NPLTLA	TLATD
ROA	1.000000	-0.22763	-0.33001	-0.2831	0.267086
NPLLP	-0.227633	1.000000	0.187480	-0.33869	0.091506
LPTLA	-0.330013	0.187480	1.000000	-0.10644	0.029683
NPLTLA	-0.283095	-0.33869	-0.10644	1.000000	-0.04754
TLATD	0.267086	0.091506	0.029683	-0.04754	1.000000

Appendix 3:-Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.831540	4	0.0079

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LPTLA	-0.096164	-0.077361	0.000075	0.0300
NPLLP	-0.019725	-0.016546	0.000004	0.1273
NPLTLA	-0.108454	-0.147788	0.000123	0.0004
TLATD	0.018013	0.022275	0.000011	0.1996

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/05/18 Time: 22:16

Sample: 2007 2016

Periods included: 10

Cross-sections included: 6

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.033969	0.006263	5.423328	0.0000
LPTLA	-0.096164	0.025835	-3.722193	0.0005
NPLLP	-0.019725	0.005667	-3.480826	0.0010
NPLTLA	-0.108454	0.038882	-2.789296	0.0075
TLATD	0.018013	0.008378	2.149923	0.0364

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.511838	Mean dependent var	0.025790
Adjusted R-squared	0.423969	S.D. dependent var	0.010317
S.E. of regression	0.007830	Akaike info criterion	-6.710673
Sum squared resid	0.003066	Schwarz criterion	-6.361616
Log likelihood	211.3202	Hannan-Quinn criter.	-6.574138
F-statistic	5.825013	Durbin-Watson stat	1.384258
Prob(F-statistic)	0.000016		

Appendix 4:-Test of Heteroskedasticity

Heteroskedasticity Test: White

F-statistic	1.240639	Prob. F(5,54)	0.3031
Obs*R-squared	6.182260	Prob. Chi-Square(5)	0.2889
Scaled explained SS	5.569338	Prob. Chi-Square(5)	0.3504

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 01/05/18 Time: 00:53

Sample: 1 60

Included observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.46E-05	2.22E-05	2.910658	0.0052
NPLLP^2	3.28E-05	3.24E-05	1.013273	0.3154
LPTLA^2	-0.000276	0.000617	-0.447255	0.6565
NPLTLA^2	0.000531	0.001541	0.344371	0.7319
TLATD^2	-0.000110	4.83E-05	-2.275512	0.0269
DUM607^2	-4.97E-05	6.18E-05	-0.804241	0.4248
R-squared	0.103038	Mean dependent var		4.05E-05
Adjusted R-squared	0.019986	S.D. dependent var		6.09E-05
S.E. of regression	6.03E-05	Akaike info criterion		-16.49946
Sum squared resid	1.96E-07	Schwarz criterion		-16.29003
Log likelihood	500.9838	Hannan-Quinn criter.		-16.41754
F-statistic	1.240639	Durbin-Watson stat		2.051263
Prob(F-statistic)	0.303122			

Appendix 5: - Test of autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.341503	Prob. F(2,52)	0.1062
Obs*R-squared	4.957047	Prob. Chi-Square(2)	0.0839

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 01/05/18 Time: 00:55

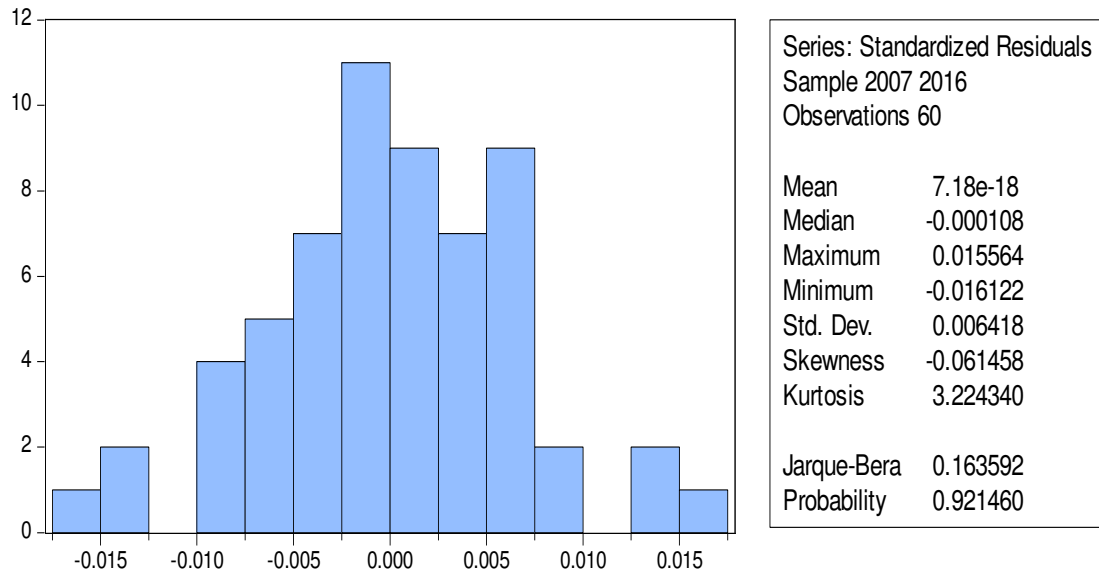
Sample: 1 60

Included observations: 60

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000363	0.004879	0.074313	0.9410
NPLLP	-0.000150	0.004506	-0.033184	0.9737
LPTLA	-0.004544	0.020588	-0.220709	0.8262
NPLTLA	0.011194	0.032945	0.339773	0.7354
TLATD	-0.000854	0.006492	-0.131544	0.8959
DUM607	0.004085	0.007283	0.560888	0.5773
RESID(-1)	0.283478	0.148717	1.906153	0.0622
RESID(-2)	0.071083	0.140998	0.504140	0.6163
R-squared	0.082617	Mean dependent var		6.14E-18
Adjusted R-squared	-0.040876	S.D. dependent var		0.006418
S.E. of regression	0.006548	Akaike info criterion		-7.095715
Sum squared resid	0.002230	Schwarz criterion		-6.816469
Log likelihood	220.8715	Hannan-Quinn criter.		-6.986487
F-statistic	0.669001	Durbin-Watson stat		1.873766
Prob(F-statistic)	0.697120			

Appendix 6:-Normality



Appendix 7:- Multicollinearity

	NPLLP	LPTLA	NPLTLA	TLATD
NPLLP	1.000000	0.187480	-0.338694	0.091506
LPTLA	0.187480	1.000000	-0.106438	0.029683
NPLTLA	-0.338694	-0.106438	1.000000	-0.047537
TLATD	0.091506	0.029683	-0.047537	1.000000

Appendix 7:- Regression result

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/05/18 Time: 01:06

Sample: 2007 2016

Periods included: 10

Cross-sections included: 6

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.029195	0.005033	5.800643	0.0000
NPLLP	-0.012455	0.004674	-2.664748	0.0104
LPTLA	-0.100671	0.020471	-4.917701	0.0000
NPLTLA	-0.071777	0.031487	-2.279591	0.0270
TLATD	0.017800	0.006634	2.683401	0.0099
DUM607	-0.038167	0.006881	-5.546418	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.700112	Mean dependent var	0.025790
Adjusted R-squared	0.638910	S.D. dependent var	0.010317
S.E. of regression	0.006199	Akaike info criterion	-7.164576
Sum squared resid	0.001883	Schwarz criterion	-6.780613
Log likelihood	225.9373	Hannan-Quinn criter.	-7.014387
F-statistic	11.43942	Durbin-Watson stat	1.616724
Prob(F-statistic)	0.000000		