The Impact of Credit Risk on Financial Performance of Banks in Ethiopia

BY: MISKER BIZUAYEHU

A THESIS SUBMITTED TO DEPARTMENT OF ACCOUNTING AND FINANCE COLLEGE OF BUSINESS AND ECONOMICS FOR PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MSC DEGREE IN ACCOUNTING AND FINANCE

ADDIS ABABA UNIVERSITY
ADDIS ABABA, ETHIOPIA
MAY, 2015

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

This is to certify that the thesis prepared by Misker Bizuayehu, entitled: The Impact of Credit Risk Management on Financial Performance of Banks in Ethiopia and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Approved by:

Internal examiner: Dr. Laxmikantham P. Signature _____Date _____

External examiner: Dr. Zenegnaw A. Signature _____Date _____

Advisor: Dr. Abebaw Kassie (PHD) Signature_____Date_____

Abstract

This study aimed at examining the impact of credit risk management on profitability of banks in Ethiopia. Other objectives included, to determine bank specific, Industry specific and macro-economic factors that affect banks financial performance. The study used a secondary data for eight banks which stayed in the industry more than eleven years among nineteen banks which is functional at the moment in Ethiopia banking industry. Data to do the analysis is obtained from banks annual report, National Bank annual report and MoFED. In this study correlation and multiple regression analysis done with random effect model and EView software used to regress the data. Return on equity was dependent variable while nonperforming loan, capital adequacy, bank size, loan and advance to deposit ratio, inflation and GDP have taken as an independent variables. As a result the study concluded that the credit risk which is measured by nonperforming loan ratio had a significant inverse impact on banks financial performance and capital adequacy also same impact on profitability. In addition, loan to deposit ratio and bank size have a positive significant impact on banks financial performance. In general, Bank Specific factors have a significant impact on banks profitability while external factors like GDP, Inflation and interest rate spread had no significant impact on banks profitability.

Keywords: Credit Risk, Financial Performance, Bank Specific, Industry Specific, Macroeconomic factors.

Acknowledgements

Prima facie, I am grateful to the God for the good health and wellbeing that were necessary to complete this paper.

I am grateful to Abebaw Kassie (Dr.), Advisor, in the Department of Accounting and Finance. I am extremely thankful and indebted to him for sharing expertise, and sincere and valuable guidance and encouragement extended to me.

I take this opportunity to express gratitude to all of my friends for their help and support. I also thank my parents and family for the unceasing encouragement, support and attention. I also place on record, my sense of gratitude to one and all, who directly or indirectly, have lend their hand in this venture.

Misker Bizuayehu

Table of Contents

List of figures, Tables and Appendixes

List of Tables

Appendixes

List of acronyms

ADF: Augmented Dickey Fuller
AMC: Asset Management Companies
BS: Bank Size
CAR: Capital Adequacy Ratio
CAMEL: Capital, Asset, Management, Earning, and Liquidity
CC: Correlation Coefficient
CI: Condition Index
CLRM: Classical Linear Regression Model
DE: Deposit Exposure
DW: Durbin-Watson
EBIT: Earning Before Interst and Tax
EPS: Earning Per Share
FEM: Fixed Effect Model
GDI: Gross Domestic Income
GDP: Gross domestic Product
INF: general inflation rate
IS: Interest Spread
JB: Jarque-Bera
LLP: Loan Loss Provision
LTD: Loan to Deposit Ratio
MoFED: Ministry of Finance and Economic Development
NAQ: Net Asset Quality
NBE: National Bank of Ethiopia
NII: Net Interest Income
NIM: Net Interest Margin
NPL: Non-performing loans
NPLOTA: Non-performing Loan over Total Asset
NPLR: Non-performing Loan Ratio
OE: Operating Efficiency
OLS: Ordinary Least Square
PC: Provision Coverage
PLS: Panel Least Square
REM: Random Effect Model
ROA: Return on Assets
ROE: Return on Equity
ROTI: Return on Total Investment
TOL: Tolerance
VIF: Variance inflation factor

CHAPTER ONE

1 Introduction

1.1 Background of the study

Risk can be defined as a probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action.

It can be defined also as the probability that an actual return on an investment will be lower than the expected return. Financial risk is divided into the following categories: Basic risk, Capital risk, Country risk, Default risk, Delivery risk, Economic risk, Exchange rate risk, Interest rate risk, Liquidity risk, Operations risk, Payment system risk, Political risk, Refinancing risk, Reinvestment risk, Settlement risk, Sovereign risk, and Underwriting risk.

It is also defined as a situation where the probability of a variable (such as burning down of a building) is known but when a mode of occurrence or the actual value of the occurrence (whether the fire will occur at a particular property) is not. A risk is not an uncertainty (where neither the probability nor the mode of occurrence is known), a peril (cause of loss), or a hazard (something that makes the occurrence of a peril more likely or more severe).
It is also the probability of a loss or drop in value. Trading risk is divided into two general categories: (1) Systemic risk affects all securities in the same class and is linked to the overall capital-market system and therefore cannot be eliminated by diversification. Also called market risk. (2) Nonsystematic risk is any risk that isn't market-related or is not systemic. Also called nonmarket risk, extra-market risk, or un systemic risk.

Risk is a function of the likelihood of something happening and the degree of losing which arises from a situation or activity. Losses can be direct or indirect. For example, an earthquake can cause the direct loss of buildings. Indirect losses include lost reputation, lost customer confidence, and increased operational costs during recovery. The chance of something happening will impact the achievement of objectives (Basel Committee on Banking Supervision 2005).

Risk is inherent in all aspects of a commercial operation. However, for Banks and financial institutions, credit risk is an essential factor that needs to be managed. Credit risk is the possibility that a borrower or counter party will fail to meet its obligations in accordance with agreed terms. Credit risk, therefore, arises from the bank's dealings with or lending to corporate, individuals, and other banks or financial institutions. Credit risk management needs to be a robust process that enables banks to proactively manage loan portfolios in order to minimize losses and earn an acceptable level of return for shareholders. It is essential for banks having robust credit risk management policies and procedures that are sensitive and responsive to these changes. National Bank of Ethiopia issued guidelines on the Credit risk management function and it emphasizes on – Policy guidelines, organizational structure and responsibility and procedural guidelines.

Credit risk management is very important to banks as it is an integral part of the loan process. It maximizes bank risk, adjusted risk rate of return by maintaining credit risk exposure with view to shielding the bank from the adverse effects of credit risk. Banks are investing a lot of funds in credit risk.

Risk management is simply a practice of systematically selecting cost effective approaches for minimizing the effect of threat realization to the organization. All risks can be never fully avoided or mitigated simply because of financial and practical limitations (Moteff, 2005).

Risk management is defined as the identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities Risks can come from uncertainty in financial markets, project failures, legal liabilities, credit risk, accidents, natural causes and disasters as well as deliberate attacks from an adversary. The strategies to manage risk include transferring the risk to another party, avoiding the risk, reducing the negative effect of the risk, and accepting some or all of the consequences of a particular risk (Hubbard, 2009).

The risk management plan should propose applicable and effective security controls for managing risks. A good risk management plan should contain a schedule for control implementation and responsible persons for those actions (Edward, 2005). It should also select appropriate controls or countermeasures to measure each risk. Risk mitigation needs to be

approved by the appropriate level of management in order to increase profitability in a company. For example, a risk concerning the image of the organization should have top management decision behind (Payle, 1997).

Profitability refers to the positive gain from an investment or business operation after subtracting of all expenses . Profitability on a company is the difference between the income of the business and all its costs/expenses. A business that does not make profits will fail, potentially affecting employees, suppliers and the local community because their overall operations depend on profits. Profitability is the measure of the overall success of a company. It is a necessary coordination for survival. Investors could prefer a single measure of profitability that would be meaningful in all situations. Test of profitability focuses on measuring the adequacy of income by comparing it with one or more primary activity that are measured in the financial statements (Sheffrin, 2003).

Effective risk management system will minimize the complexities involved in planning, executing and controlling overall running of a business which is critical to success and this maximizes profitability in a business. A customer is happy and secure when he/she invests in a risk free business and wants to be equally happy on each further occasion. Therefore, risk management and profitability are closely related aspects and need to be handled with extra emphasis if a business is to hit high profitability over a given period (Gizycki, 2001).
Bank is the most important financial institution in the economy. They play a vital role in the economy by providing means of payment and in mobilizing resources. The economic development of a country depends on the development of banking sector to a great extent. The dependence of banking sector in modern economy is increasing day by day because this sector ultimately contributes to run the wheel of development in a more dynamic way. Today's modern banks are not only provide traditional banking services, rather banks are expanding the menu of financial services, and banks are making the untouchable service touchable for their customers. The changing and expanding role of banking has made the banking business more complex and competitive. For survival and growth of this business demands creativity, specialization and knowledge and adoption of new technology are used. But technology, creativity, specialization all these cannot support a bank to survive unless the services are marketed in the right track. For this banks need experts who will able to run the business even in against the wind (Brenda, 2013).

Banks provide the required capital to the economy in the form of loan and advances which might have some probability to fail to be paid back which is termed as credit risk, the chance that a loan will not be repaid timely. Hence the main concern of the banks is credit risk and its management as credit or loans and advances are the main source of income for them.

1.2 Problem statement

Banks in Ethiopia regardless whether they are owned either by government or private shareholders, are exposed to five types of core risks through their operation, which are-credit risk, asset/liability risk, foreign exchange risk, internal control & compliance risk, and money laundering risk. Among these risks management of credit risk gets most attention. Credit risk is one of the most vital risks for banks. Credit risk arises from nonperformance by a borrower. It may arise from either an inability or an unwillingness to perform in the pre-commitment contracted manner. The credit risk of a bank is also effect the book value of a bank. The more credit of a particular is in risk, the more probability of a bank to be insolvent. Therefore, the status of depositor in the bank is at risk and probability of incurring loss from their deposited value.

Literatures on Ethiopian banking sector documented that credit risk and non-performing loan have been major challenges of bank performance in Ethiopian (Alemauhy, 1991; NBE, 2009; Tekilebirhan, Melkamu, 2012; Gethun, 2012; Mekonen, 2012). Nonetheless, very few (Mekasha 2011; Tefera 2011; Million, 2014) examined the extent at which credit risk affected profitability performance of banks in Ethiopia.

In addition to this most of the studies conducted in Ethiopia are done only by taking bank specific factors and the main purpose of this study is to examine the impact of credit risk management on Banks profitability by taking in to consideration interest spread from industry specific and from macro-economic factors like GDP and inflation in addition to the bank specific factors.

Hence, examining the impact of credit risk management on financial performance of banks in Ethiopia is vital to check the situation in the industry as Ethiopia is the country do not allow any foreign owned banks to work in the industry and there is a very strong and direct involvement of government control in the day to day activities of banks in Ethiopia.

1.3 Objective of the study

The general objective of the study is to assess the impact of credit risk management on financial performance of Banks in Ethiopia.

1.4 Specific Objectives of the study

- To examine the impact of bank specific factors on banks profitability in Ethiopia.
- To assess the impact of Industry specific factors on banks profitability in Ethiopia.
- To evaluate the impact of macroeconomic factors on banks profitability in Ethiopia.

1.5 Research Hypothesis

Among other risks faced by banks, credit risk plays an important role on banks' financial performance since a large chunk of banks' revenue accrues from loans from which interest margin is derived (Kolapo, Ayeni&Oke, 2012, p.31). Based on the information we have studied in the previous part, we have realized that it is of great interest to study the relationship between credit risk management and profitability of commercial banks. Up to the knowledge of the researcher there is no studies conducted that is done by taking in to consideration the bank specific, industry specific and macro-economic factor as independent variables and that could clearly explain the relationship of credit risk management and profitability of commercial banks in Ethiopia.

Null Hypothesis:

H1: Nonperforming loan Ratio has no significant impact on financial performance of Banks in Ethiopia.

H2: Capital adequacy ratio has no significant impact on financial performance of Banks in Ethiopia.

H3: Loan and advance to deposit ratio has no significant impact on financial performance of Banks in Ethiopia.

H4: Bank Size has no significant impact on financial performance of Banks in Ethiopia.

H5: Interest Spread Rate has no significant impact on financial performance of Banks in Ethiopia.

H6: Gross domestic product has no significant impact on financial performance of Banks in Ethiopia.

H7: Inflation has no significant impact on financial performance of Banks in Ethiopia.

1.6 Scope of study

1.6.1Geographical scope

The study will be conducted in all banks in Ethiopia including the state owned commercial banks. As all banks are working almost in all direction of the country, the result of the study can represent all picture of the country.

1.6.2 Subject scope

The study specifically has focused on the impact of credit risk management on profitability by categorizing determinants of credit risk in to three groups (i. bank specific, industry specific and macro-economic factors) and then later by checking those determinants against the profitability of banks.

1.7 Significance of the study

The study findings enable the management of different banks of Ethiopia to properly carry out risk management and to know the relationship between credit risk and the profitability of banks then it enables them to reduce losses and increase profitability.

It can also act as a source of literature for other scholars who intend to carry out further research on the effect of risk management on profitability with specific reference to banking institutions.

1.8 Organization of the study

In this study chapter one is made from: the background of the study, problem statement, specific and general objective of the study, a research hypothesis, scope and significance of the study.

In chapter two various theories and empirical studies are overviewed and the studies are summarized with their methodologies, variables used, findings and conclusion. In addition theories about each dependent and independent variables are presented.

Third chapter is the methodology part and includes the research design, nature of data used, sampling design, data processing analyzing and presentation methods are presented. Moreover the model specification and the researcher expectation had described.

Under chapter four the result of the regression finding is discussed and also the five assumption of Classical Linear Regression Model (CLRM) are tested. In this part the descriptive statistics data and correlation analysis also has conducted.

Finally, in chapter five the conclusion made based on the finding obtained in chapter four and also appropriate recommendations has given.

CHAPTER TWO

2 RIVIEW OF RELATED LITERATURES

Introduction

This chapter presents what other scholars have written about the impact of risk management in relation to profitability of banks, the variables and methodology they used as well as their findings and recommendations. In addition thisb part defined and look at the theories which is written about each dependent and independent variables including the measurement of bank performance and credit risk by various authors.

2.1 Theoretical Frameworks

Credit risk is one among many factors with a substantial influence on the stability of a banking system. It is important to measure and control the determinants of the credit risk, especially at the aggregated level. Generally, macroeconomic, banking sector and also microeconomic level variables are the most important for analysis of credit risk.

Carling, Jacobson et al report that, macroeconomic variables should be included into credit risk analysis since they have considerable influence on the changes of credit risk at the aggregated level. Negative changes of macroeconomic variables are usually treated as external negative shocks. External negative shock can be interpreted as the negative difference between the real and expected value of macroeconomic parameters. Negative shock can be spurred by the change of any macroeconomic parameter.

2.1.1 Loan Pricing Theory

Banks cannot always set high interest rates. Banks should consider the problems of adverse selection and moral hazard since it is very difficult to forecast the borrower type at the start of the banking relationship (Stiglitz and Weiss, 1981). If banks set interest rates too high, they may induce adverse selection problems because high-risk borrowers are willing to accept these high rates. Once these borrowers receive the loans, they may develop moral hazard behavior or so called borrower moral hazard since they are likely to take on highly risky projects or investments (Chodecai, 2004). From the reasoning of Stiglitz and Weiss, specify that in some cases we may not find that the interest rate set by banks is commensurate with the risk of the borrowers.

2.1.2 Firm Characteristics Theories

These theories predict that the number of borrowing relationships will be decreasing for small, high-quality, informational opaque and constraint firms, all other things been equal (Godlewski and Ziane, 2008).Robert and Gary (1994 cited in Hamisu (2011).) state that the most obvious characteristics of failed banks is not poor operating efficiency, however, but an increased volume of non-performing loans. Non-performing loans in failed banks have typically been associated with regional macroeconomic problems. DeYoung and Whalen (1994 cited in Hamisu (2011) observed that the US Office of the Comptroller of the Currency found the difference between the failed banks and those that remained healthy or recovered from problems was the caliber of management. Superior mangers not only run their banks in a most efficient fashion, and thus generate large profits relative to their peers, but also impose better loan underwriting and monitoring standards than their peers which result in better credit quality.

2.1.3 Theory of Multiple-Lending

It is found in literature that banks should be less inclined to share lending (loan syndication) in the presence of well-developed equity markets. Both outside equity and mergers and acquisitions increase banks‟ lending capacities, thus reducing their need of greater diversification and monitoring through share lending (Carletti, 2006; Ongene and Smith, 2000; Karceski, 2004; Degryse, 2004).

2.1.4 The Signaling Arguments

The signaling argument states that good companies should provide more collateral so that they can signal to the banks that they are less risky type borrowers and then they are charged lower interest rates. Meanwhile, the reverse signaling argument states that banks only require collateral and or covenants for relatively risky firms that also pay higher interest rates (Chodechai, 2004; Ewert and Schenk, 1998).

2.1.5 Credit Market Theory

A model of the neoclassical credit market postulates that the terms of credits clear the market. If collateral and other restrictions (covenants) remain constant, the interest rate is the only price mechanism. With an increasing demand for credit and a given customer supply, the interest

rate rises, and vice versa. It is thus believed that the higher the failure risk of the borrower, the higher the interest premium (Ewert, 2000).

The theoretical framework for this study is adapted from (Patnaik and Vasudevan, 1998), which tries to factor the degree of openness of an economy in the analysis of the influence of both internal and external factors on interest rate movements in a semi-open economy like Nigeria. Suppose we have a closed economy, in which there is no inflow or outflow of capital and the demand for money is the demand for real money. In such an economy, money is held by the economic units purely to finance transactions and increase the demand for money with real output.

However, it is worthy of note, that holding money has an opportunity cost that is measured by the nominal rate of interest, with higher interest rates discouraging the holding of wealth in the form of money.

2.2 Empirical studies

This part of the study summarizes various studies conducted in different countries which is related with banks profitability and credit risk management. The researcher start reviewing empirical studies first those studies which concluded on the existence of significant impact of credit risk on banks profitability and then reviewing those empirical studies which concluded the existence of positive impact of credit risk management on banks profitability and then later reviewing those studies which shows the negative relationship of credit risk and banks profitability.

Finally the researcher has reviewed those empirical studies with the same topic but conducted by taking in to consideration external determinants of bank profitability and also studies conducted in Ethiopia as well.

The study conducted with the title of Efficiency of Credit Risk Management on the Performance of Banks in Nigeria A Study of Union Bank PLC (2006-2010) by Rufai, 2013 aimed at assessing the efficacy of credit risk management on banks performance. Also to determine if credit risk have effect on the profitability and examining the relationship between interest income and bad debt of the Union Bank. In this study, Return on equity and Return on assets indicates the overall profitability and efficiency while Non-performing loan over total assets shows the level of banks' exposure to credit risk. The study population of the twenty-

one (21) commercial banks in Nigeria. Secondary sources of data were used for the study. Time series and trend analysis are used for the analysis. Correlation coefficient and regression analysis were used in testing the hypotheses. The study conclude that credit risk affect the performance of Union Bank PLC and that to maintain high interest income, attention needs to be given to credit risk management especially regarding the lending philosophy of Union Bank.

Similarly the study conducted by Awoyemi Samuel Olausi,Banks year 2014 with the title of The Impact of Credit Risk Management on the Commercial Banks Performance in Nigeria by is the study which is made with the objective to investigate the impact of credit risk management on the performance of commercial banks in Nigeria. In the model, Return on Equity (ROE) and Return on Asset (ROA) were used as the performance indicators while Non-Performing Loans (NPL) and Capital Adequacy Ratio (CAR) as credit risk management indicators. The data used in this study is a financial reports of seven commercial banks for seven years (2005 – 2011). The panel regression model was employed for the estimation of the model. The findings revealed that credit risk management has a significant impact on the profitability of commercial banks' in Nigeria.

In the same way the study conducted by Taiwoetal in 2013 with a title of Credit Management Spur Higher Profitability? Evidence from Nigerian Banking Sector which evaluates the impact of credit risk management on bank profitability of some selected commercial banks in Nigeria. The study took dependent Variable ROA = Return on Assets - Ratio of Profit after tax to total assets. (Proxy for Profitability), total assets. (Proxy for Profitability); and independent variables:- LA2TA = Loan & advances to Total Asset .; NP2TL = Non Performing Loan to Total Loan. This study using econometric analysis method on annual time series data of ten banks over the period of 2006 to 2012. The results from Levin, Lin & Chu unit root test shows that all the variables were non-stationary at level. The results from Panel Least Square (PLS) estimate found that that credit risk management has a significant impact on the profitability of Nigeria banks.

In year 2013 the study conducted by Noraini et al on Risk Management Practices and Financial Performance of Islamic Banks aims to analyze the relationship between risk management practices and financial performance in the Islamic banks in Malaysia. In efforts to assess the risk management practices in the Islamic banks by using the descriptive tests, the study used the 5-Likert scale approach in the questionnaire. The higher the scale indicates that the

respondent strongly agrees to such practices adopted by their banks. Risk management practices are covered in five parts: Risk Management Environment, Policies and Procedures, Risk Measurement Practices, Risk Mitigation Practices, Risk Monitoring Practices and Internal Control Practices as suggested by the Basel Committee on Banking Supervision. The study uses both the primary (survey questionnaires) and secondary data (annual reports). Overall, the findings on risk management practices show the importance of board of directors to approve the overall policies and to ensure that management takes necessary actions to manage the risks.

The study conducted by Kosmas Njanike in year 2009 with the title of The Impact of Effective Credit Risk Management on Bank Survival emphasizes on the reason where banking crises comes from. The study seeks also to evaluate the extent to which failure effectively manage credit risk led to Zimbabwe's banks' demise in 2003/2004 bank crisis. In this study the questionnaire method were used and 12 short questions designed for the bankers and or senior managers from those banks so that they would not have a difficulty in answering questions. The first two questions constituted the respondent profile. The two questions that followed formed the administrative section where the research was obtaining information about the financial institution. Question five up to the end of the questionnaire formed the main body from which the crucial data for the research was obtained. The research data was collected over six months to June 2009. The researcher chose the survey as the appropriate research design for the study, and as such, questionnaires and interviews were used as research instruments. The study found that the failure to effectively manage credit risk contributed to a greater extent to the banking crisis.

In year 2012 the research made in Kenya by Ogilo Fredrick with the title of The Impact Of Credit Risk Management On Financial Performance Of Commercial Banks In Kenya analyzed the impact of credit risk management on the financial performance of commercial banks and also 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 study took an independent variables of: CAMEL components, capital adequacy, asset quality, management efficiency and liquidity and the dependent variable financial performance (ROE).The study took an independent variables of: CAMEL components, capital adequacy, asset quality, management efficiency and liquidity and the dependent variable financial performance (ROE).A causal research design was undertaken in this study and this was facilitated by the use of secondary data which was obtained from the Central Bank of

Kenya publications on banking sector survey. The study used multiple regression analysis in the analysis of data and the findings have been presented in the form of tables and regression equations. The study found out that there is a strong impact between the CAMEL components on the financial performance of commercial banks. This study concludes that CAMEL model can be used as a proxy for credit risk management.

The other study which found the existence of credit risk management on banks profitability is the research conducted by AraHodna et al in year 2009 with the title of Credit Risk Management and Profitability in Commercial Banks in Sweden is tried to find out how the credit risk management affects the profitability of banks. The main purpose of the study was to describe the impact level of credit risk management on profitability in four commercial banks in Sweden. In the model it was defined ROE as profitability indicator while NPLR and CAR as credit risk management indicators. The quantitative method is used in order to fulfill the main purpose of the study. This study used regression model to do the empirical analysis. The data is collected from the sample banks annual reports (2000-2008) and capital adequacy and risk management reports (2007-2008). The findings and analysis reveal that credit risk management has effect on profitability in all 4 banks. Among the two credit risk management indicators, NPLR has a significant effect than CAR on profitability (ROE).

Similarly, there is a research conducted in year 2012 called Impact of Risk Management on Non-Performing Loans and Profitability of Banking Sector of Pakistan (ShahbazHaneef et-al, 2012).The aim of the study was to investigate the impact of risk management on non-performing loan and profitability of banking sector of Pakistan. In the model it was defined ROA as profitability indicator while NPLR as credit risk management indicators. Five banks were selected for data collection and whole data was secondary in nature. The result of this study reveals that there is no proper mechanism for risk management in banking sector of Pakistan. Study also concluded that non-performing loans are increasing due to lack of risk management which threatens the profitability of banks.

A slight different result is obtained by the research conducted with a title of Credit Risk and Commercial Banks' Performance in Nigeria: A Panel Model Approach (KOLAPO, T. Funso et-al, 2012). The study carried out an empirical investigation into the quantitative effect of credit risk on the performance of commercial banks in Nigeria over the period of 11 years

(2000-2010). The traditional profit theory was employed to formulate profit, measured by Return on Asset (ROA), as a function of the ratio of Non-performing loan to loan & Advances (NPL/LA), ratio of Total loan & Advances to Total deposit (LA/TD) and the ratio of loan loss provision to classified loans (LLP/CL) as measures of credit risk. Five commercial banking firms were selected on a cross sectional basis for eleven years. Panel model analysis was used to estimate the determinants of the profit function. The results showed that the effect of credit risk on bank performance measured by the Return on Assets of banks is cross-sectional invariant. That is the effect is similar across banks in Nigeria, though the degree to which individual banks are affected is not captured by the method of analysis employed in the study.

From those studies which support a positive impact of credit risk management on banks profitability, is the study conducted and has a title Impact of Credit Risk Management and Capital Adequacy on the Financial Performance of Commercial Banks in Nigeria (OGBOI, Charles, 2013). This study examined the impact of credit risk management and capital adequacy on banks financial performance in Nigeria. The study used variables of loan loss provisions (LLP), loans and advances (LA), non-performing loans (NPL), capital adequacy (CA) and return on asset (ROA). Panel data model was used to estimate the relationship that exists among variables. Results showed that sound credit risk management and capital adequacy impacted positively on bank's financial performance with the exception of loans and advances which was found to have a negative impact on banks' profitability in the period under study.

In addition, the study by NevineSobhy Abdel Megeid, 2013 with a title of The Impact of Effective Credit Risk Management on Commercial Banks Liquidity Performance: Case of Egypt was made. This study was conducted to examine the impact of bank's credit risk management on improving liquidity performance, in the Egyptian commercial banks. The study select and took a sample of 8 Egyptian commercial banks. The research is done on the financial statements analysis for the period 2004-2010, based on Bankscope database. The researcher uses Panel data analysis using Stata, where data are collected over 7 years and over the same sample, then a regression is run over these two dimensions (cross-sectional time-series).The study found the significant and positive relationship between effective credit risk management and improving liquidity levels in Egypt commercial banks.

There is also a study called Credit Risk and Profitability of Selected Banks in Ghana which is conducted by Samuel Hymoreet'al in 2012.This study attempts to reveal the relationship between credit risk and profitability of some selected banks in Ghana. The dependent variable in the model is Return on Equity while the explanatory variable is Credit Risk which is measured by three main variables- Net Charge Off to Total Loans and Advances, Non-Performing Loans to Total Loans and Advances and Pre-provision Profit to Total Loans and Advances. The researcher also controlled for the effects of other factors on firm profitability. These include bank size, bank growth rate and the choice of capital structure. A panel data from six selected commercial banks covering the five-year period (2005-2009) was analyzed within the fixed effects framework. From the results credit risk (non-performing loan rate, net charge-off rate, and the pre-provision profit as a percentage of net total loans and advances) has a positive and significant relationship with bank profitability.

Moreover the study titled Credit Risk Management and Profitability of Selected Rural Banks In Ghana (Harrison Owusu AFRIYIE, 2013). This study examines the impact of credit risk management on the profitability of rural and community banks in the BrongAhafo Region of Ghana. In the model, definition of Return on Equity (ROE) and Return on Asset (ROA) were used as profitability indicator while Non-Performing Loans Ratio (NLPR) and Capital Adequacy Ratio (CAR) as credit risk management indicators. The data used for analysis, ten rural banks financial statements from the period of 2006 to 2010 (five years). The panel regression model was employed for the estimation. The findings indicate a significant positive relationship between non-performing loans and rural banks' profitability revealing that, there are higher loan losses but banks still earn profit.

To the contrary of the above studies, there are studies which concluded a negative relationship between credit risk management and banks profitability. One of them is the study conducted by Danson Musyoki in 2011 with the title of The Impact of Credit Risk Management on The Financial Performance of Banks in Kenya for The Period 2000-2006.The objective of study was to assess various parameters pertinent to credit risk management as it affects banks' financial performance. The Return on Assets (ROA) is a ratio that measures company earnings before interest & taxes (EBIT) against its total net assets. The ratio is considered an indicator of how efficient a company is using its assets to generate before contractual obligation must be paid. It is calculated as: ROA= EBIT/ Total Assets. Return on assets gives an indication of the

capital intensity of the banking industry, which will depend on the industry; banks that require large initial investment will generally have lower return on assets (Apps, 1996).Parameters covered in the study were; default rate, bad debts costs and cost per loan asset. The study employed simple random sampling in order to pick 10 banks. Financial reports of 10 banks was used to analyze profit ability ratio for seven years (2000-2006) comparing the profitability ratio to default rate, cost of debt collection an cost per loan asset which was presented in descriptive, regression and correlation was used to analyze the data. The study revealed that all these parameters have an inverse impact on banks' financial performance, however the default rate is the most predictor of bank financial performance vis-à-vis the other indicators of credit risk management.

In addition, Poudel (2012) studied the factors affecting commercial bank performance in Nepal for the period of 2001 to 2012 and followed a linear regression analysis technique. The study revealed a significant inverse relationship between commercial bank performance measured by ROA and credit risk measured by default rate and capital adequacy ratio.

Hosna et al. (2009) also found a similar result with Poudel in his study of four Swedish banks covering a period of 2000 to 2008. The result showed that rate of non-performing loan and capital adequacy ratios was inversely related to ROE though the degrees vary from one bank to the other. Such inverse relationships between profitability, performance and credit risk measures were also found in other studies (Achou and Tenguh, 2008; Funso et al., 2012; Musyoki and Kadubo, Tomak (2013) conducted study on the "Determinants of Bank's Lending Behavior of commercial banks in Turkish" for a sample of eighteen from 25 banks. The main objective of the study was to identify the determinants of bank`s lending behavior. The data was covered2003 to 2012 periods. The variables used were size, access to long term funds, interest rates, GDP growth rate and inflation rate. The finding reveals that bank size, access to long term loan and inflation rate have significant positive impact on the bank`s lending behavior but, interest rates and GDP are insignificant.

On the other side the research conducted by Castro, 2013 analyses the link between the macroeconomic developments and the banking credit risk in a particular group of countries: Greece, Ireland, Portugal, Spain, and Italy (GIPSI)- those recently affected by unfavorable economic and financial conditions. Employing dynamic panel data approaches to these five countries over the period 1997q1-2011q3, they conclude that the banking credit risk is

significantly affected by the macroeconomic environment: the credit risk increases when GDP growth and the share and housing price indices decrease and rises when the unemployment rate, interest rate, and credit growth increase; it is also positively affected by an appreciation of the real exchange rate; moreover, they observe a substantial increase in the credit risk during the recent financial crisis period. Several robustness tests with different estimators have also confirmed these results. The findings of this paper indicate that all policy measures that can be implemented to promote growth, employment, productivity and competitiveness and to reduce external and public debt in these countries are fundamental to stabilize their economies.

Finally the researcher tried to find a studies which is conducted in Ethiopia and to the best knowledge of the researcher studies on the relationship between credit risk and profitability performance of Ethiopian commercial banks are few. Of these studies, Tefera (2011) and Mekasha (2011) each studied the effect of credit risk management on the performance of commercial banks in Ethiopia. Both used secondary data from annual reports of commercial banks and survey of primary data from bank managers and officers which similarly showed that there is a negative relationship between credit risk and performance of commercial banks in Ethiopia. On the contrary, the research conducted by Million (2014) shows the significant positive relationship between Loan loss provision and commercial banks performance on this study might indicates the presence of potential earning management activities by bank managers.

The research paper which is done by Tesfaye, 2014 with the title of The Determinants of Ethiopian Commercial Banks Performance investigates the determinants of Ethiopian banks performance considering bank specific and external variables on selected banks' profitability for the 1990-2012 periods. The empirical investigation uses the accounting measure Return on Assets (ROA) to represent Banks' performance. The study finds that bank specific variables by large explain the variation in profitability. High performance is related to the ability of banks to control their credit risk, diversify their income sources by incorporating non-traditional banking services and control their overhead expenses. In addition, the paper finds that bank's capital and liquidity status are not significant to affect the performance of banks. On the other hand, the paper finds that bank size and macro-economic variables such real GDP growth rates have no significant impact on banks' profitability. However, the inflation rate is determined to be significant driver to the performance of the Ethiopian commercial banks

2.3 Determinants of Bank Performance

In most of the literatures, there are two way and sometimes three ways of classifying the determinants of bank performance. Al-Tamimi, 2010; Aburime, 2005, for instance classified the determinant factors in to two: bank specific (internal) and macroeconomic variables. The internal factors are individual bank characteristics which affect the bank's performance. These factors are basically influenced by the internal decisions of management and board. The external factors are sector wide or country wide factors which are beyond the control of the company and affect the profitability of banks. Other studies, Ongore, 2011, attempted to integrate sector specific factors like bank ownership bank size and concentration as a specific determinant of bank performance. This approach seems to segregate the external factor determinants in to sector specific and macroeconomic variable. However, some authors, (Chantapong, 2005; Olweny and Shipho, 2011) focused on sector specific variables with total neglection of the macroeconomic variables like GDP and inflation. In general the two approaches seem similar in context and wide variation is not observed in classifying the determinants of bank performance and most of the researchers used both internal and external variables in their studies.

➢ *The Internal Determinants*

Internal determinants of bank performance can be defined as factors that are influenced by a bank's management decisions. Such management effects will definitely affect the operating results of banks. Although a quality management leads to a good bank performance, it is difficult, if not impossible, to assess management quality directly. In fact, it is implicitly assumed that such a quality will be reflected in the operating performance (Anna P. I et al 2009).

More precisely, the internal factors are bank specific variables which influence the profitability of specific bank, (Al-Tammie, 2010; Aburime, 2005). Even if there is variation in the number of determinant factors pointed out by the number of studies, the variables can be summarized using the CAMEL framework to proxy the bank specific factors as done in the study of Dang, 2011.

➢ *External Determinants of Bank Performance*

A factor that is pertinent to a broad economy at the regional or national level and affects a large population rather than a few select individuals. Macroeconomic factors such as economic output, unemployment, inflation, savings and investment are key indicators of economic performance and are closely monitored by governments, businesses and consumers.

External determinants of bank profitability are factors that are beyond the control of a bank's management. They represent events outside the influence of the bank, (Al-Tamimi, 2010; Aburime, 2005). The two major components of the external determinants are sector specific and macroeconomic factors.

Macro-Economic Related

There is wide variety of literature support the impact of the macroeconomic factors impact on bank performance. The macroeconomic policy stability, Gross Domestic Product, Inflation, Interest Rate and Political instability are also other macroeconomic variables that affect the performances of banks.

2.4 Conceptual Frame Work

The main objective of this study is to examine the impact of Credit risk management of banks on profitability. Based on the objective of the study, the following conceptual model is framed. As it described previously in the related literature review parts, bank profitability can be affected by bank specific, industry specific or macroeconomic factors. Bank specific factors are: non-performing loans overt total loan, capital adequacy ratio, bank size, and Loan-deposit.

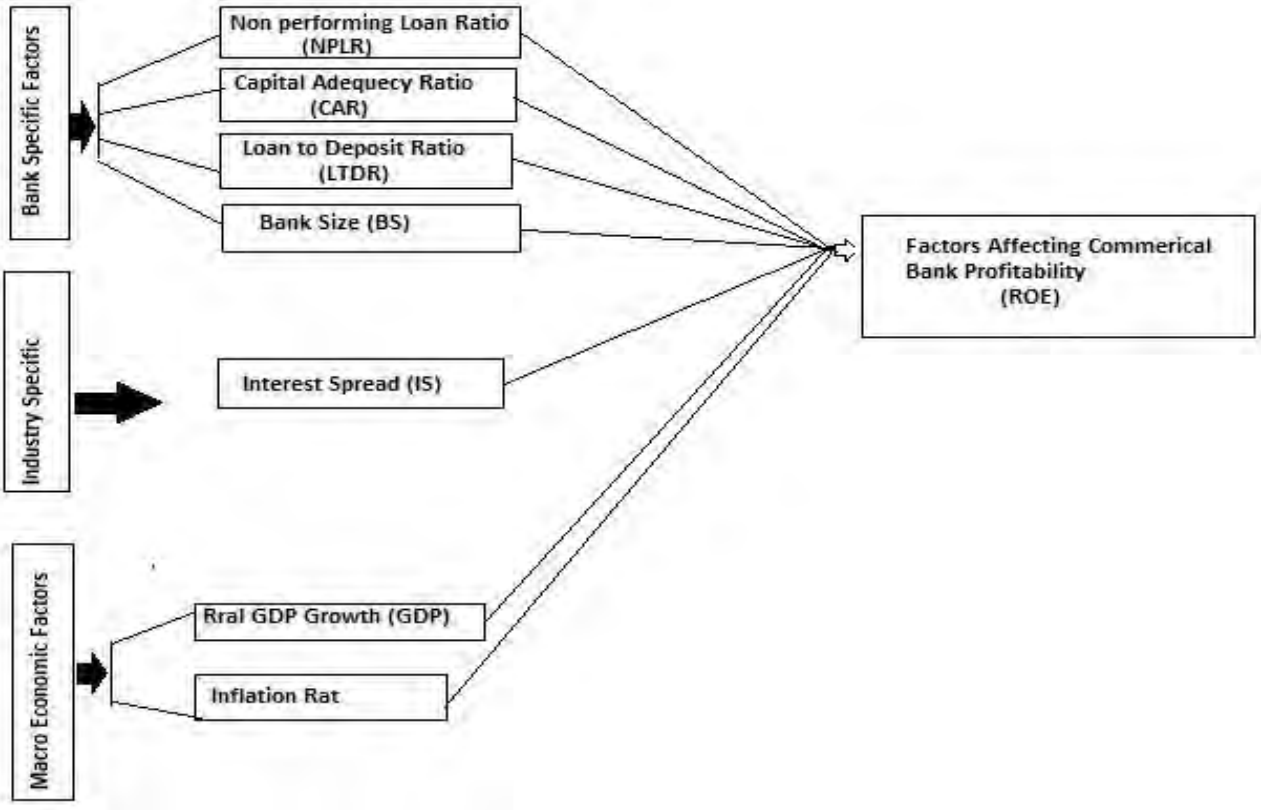
In addition to this there are also macroeconomic factors which can affect bank profitability such as economic growth which is measured by GDP and inflation. For this study the researcher also took interest spread rate from the industry specific as this rate will going to determine partially by the government and also the market rate. Thus, the following conceptual model is framed to summarize the main focus and scope of this study in terms of variables included.

2.5 Summary and Knowledge Gap

Up to the best knowledge of the researcher, in Ethiopia context it's not possible to get a study which took; bank specific, industry specific and macro-economic factors to test the impact of credit risk management on financial performance of banks in Ethiopia.

The current study therefore aimed at contributing to the literature gap on the subject matter by expanding the independent variables and also taking into consideration of the external determinants of profitability factors like interest spread, inflation and GDP. This study is conducted first by considering both internal and external factors and analyze the impact of those variables on banks profitability. This enables the researcher to evaluate from different three directions and to examine the impact of credit risk management on profitability of Ethiopian banks.

Figure 2.1 Conceptual fremework



CHAPTER THREE
3 METHODOLOGY

Introduction

This chapter of the research report consists of the research design, study population, sample size and selection, sampling techniques procedure, sources of data, data collection methods, data collection tools and instruments, data processing, data summary and presentation data analysis.

3.1 Research design

Research design is the "blue print" of the study. The design of a study defines the study type (descriptive, correlational, semi-experimental, experimental, review, meta-analytic) and sub-type (e.g., descriptive-longitudinal case study), research question, hypotheses, independent and dependent variables, experimental design, and, if applicable, data collection methods and a statistical analysis plan. Research design is the framework that has been created to seek answers to research questions.

Many research designs could be used to study business problems (Hair et al., 2011). Depending on the way in which researchers ask their research questions and present their purpose, the research design could be classified into three groups, namely exploratory, descriptive and explanatory studies (Saunders et al., 2009, p. 138& 139).

According to Hair et al., 2011 exploratory study is performed when the researcher has little information. This accords with Ghauri and Grønhaug (2005, p.58) who state: “When the research problem is badly understood, a (more or less) exploratory research design is adequate.” It is particularly useful to clarify the understanding of a problem, such as if you are unsure of the precise nature of the problem (Saunders et al., 2009, p. 139). Therefore, exploratory research must be flexible and adaptable to change. That is to say, researchers are willing to change their direction as a result of new data that appear and new insights that occur to them (Saunders et al., 2009, p. 140). A number of researchers have claimed that the exploratory approach leads to new and useful theories. But there is also the danger that the research will produce false leads or useless theories (Armstrong, 1970, p.2). Bobbie (2004) in

another way states that the major shortcoming of this research design is that it seldom provides satisfactory answers to the research question.

As to the descriptive studies, they are designed to obtain data that describe the characteristics of the topic of interest in the research (Hair et al., 2011, p.148). The objective of descriptive study is to represent an accurate profile of persons, events or situations (Robson, 2002, cited in Saunders et al., p. 140). In descriptive research, the research problem is structured and well understood (Ghauri and Grønhaug, 2005, p. 58).Saunders et al. (2009) expanded the idea like "it is necessary to have a clear picture of the phenomena on which you wish to collect data prior to the collection of data." Compared with exploratory study, descriptive study would give the readers acomfortary answer addressed to the research question. In other words, it is used for testing hypothesis (Hair et al., 2011, p.149).

The last category is explanatory study (Saunders et al., 2009, p. 140) or in some book scaled "causal research design" (Hair et al., 2011, p.147). In this research, the problems are well structured as in descriptive studies. In contrast to descriptive studies, the researcher is facing with "causes-and-effects" problems. The main task is to separate such causes and to say to what extent they lead to such effects (Ghauri and Grønhaug, 2005, p. 59). In other words, it is to explain the causal relationship between variables (Saunders et al., 2009, p. 140).

Based on the study of three research designs and the purpose of this research, the explanatory study is the most suitable for the topic. Even though this research starts with the description about credit risk management and profitability of commercial banks, its ultimate goal is to test if the relationship exists and how the credit risk management could impact on profitability of commercial banks in Ethiopia. That is to say, the aim is to find causes of profitability. Hence, it is considered explanatory study as this research design.

3.2 Nature of Data and Instruments of Data collection

This study used panel data. The researcher prefers to use panel data since panel data can take heterogeneity among different units into account over time by allowing for individual-specific variables. Besides, by combining time series and cross-section observations, it gives more informative data. Furthermore, panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data (Gujarati, 2004).

The main sources of data for the study is obtained from the balance sheet and income statement of eight purposively selected banks. From those banks, 11 consecutive years' (i.e from 2003-2013) balance sheet and income statement reports have been used for the study. In Ethiopia it's a must for banks to report and submit their annual report to the controlling body in this case NBE. As a result it makes life easy for the researcher to get annual reports of all selected banks from the NBE central data base and the financial statements from the annual audited report of NBE. Data from balance sheet and income statements are used for this research and to run the model.

The main reason to take only those 8 banks which stayed in the industry is to exclude those banks who start operation very recently and have no that much credit risk. This is because the main reason the credit becomes risky when it couldn't be paid for longer period or when there is a delay to pay. In addition taking more than 10 years data will show the trained and can avoid a one or two years unusual occurrences in the industry.

3.3 Sampling Design

The "best" sample design depends on survey objectives and on survey resources. For example, a researcher might select the most economical design that provides a desired level of precision. Or, if the budget is limited, a researcher might choose the design that provides the greatest precision without going over budget.

Sample design deals with study population, sample frame, sample size and sampling technique. Sampling is a technique of selecting a suitable sample for the purpose determining parameters of the whole population. Population is the list of elements from which the sample may be drawn (John, 2007).A sample is drawn to overcome the constraints of covering the entire population with the intent of generalizing the findings to the entire population.

3.3.1 Study Population

A population study is a study of a group of individuals taken from the general population who share a common characteristic. In this study population is all banks in Ethiopia and the result obtained from this study can be as a reference for all the other banks which are working in the industry. As Ethiopia do not allow any foreign owned banks to invest and work in the industry and the government strong supervision makes the industry to work in almost with the same fashion.

3.3.2 Population Size

The population is the aggregate or collection of units about which the survey will be conducted. Units can refer to people, households, schools, hospitals, businesses etc. There are two different populations that a survey is concerned with. We have a target population, the group of units about which information is wanted, and a survey population, the units that we are able to survey. The target population is also known as the scope of the survey, the population that the survey is aimed at; the survey population is also called the coverage, the population the survey actually covers. Ideally the survey population should correspond exactly with the target population, however, the two populations may not match, so the conclusions based on survey data only apply to the survey population.

The target population of this study were nineteen banks in Ethiopia which are: Commercial Bank of Ethiopia, Construction and Business Bank, Dashin Bank, Awash International Bank, Bank of Abyssinia, Wegagen Bank, United Bank, Lion International Bank, Cooperative Bank of Oromia, Nib International Bank, Zemen Bank, Oromia International Bank, Bunna Bank, Birhan International Bank, Abay Bank, Addis International Bank, Debub Global Bank,EnatBank and Development Bank of Ethiopia. From these listed banks only three of them are state owned banks, while the remaining 16 banks are owned by private shareholders.

3.3.3 Sample Frame

After the researcher has listed all the banks in the industry it is selected those eight banks which works in the industry from 2003 to 2013. This is because of data availability during this period. Accordingly, the researcher took those eight banks which stayed in the industry for more than eleven years. These are Commercial Bank of Ethiopia, Construction and Business Bank, Dashin Bank, Awash International Bank, Bank of Abyssinia, Wegagen Bank, United Bank, Nib International Bank. By doing so the researcher can avoid those banks which start operation very recently and has no that much a credit risk.

3.3.4 Sample Size

Sample size determination is the act of choosing the number of observations or replicates to include in a statistical sample. The sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample. In practice, the

sample size used in a study is determined based on the expense of data collection, and the need to have sufficient statistical power. In complicated studies there may be several different sample sizes involved in the study: for example, in astratified survey there would be different sample sizes for each stratum. In a census, data are collected on the entire population, hence the sample size is equal to the population size. In experimental design, where a study may be divided into different treatment groups, there may be different sample sizes for each group.

In this study, as the number of banks in the industry are very small, no need of taking the sample size from the sample frame as a result the sample size will be same as the sample frame. To this end, the sample size of this study is not less than specified sample size required for ones' study since the accuracy and validity of the works never guaranteed by increasing the sample size beyond specified limit. This is due to the fact that increasing the number of sample size beyond the specified sample size required for ones' study never add value to the accuracy of the study rather it made information unmanageable due to redundancy(Ayalew, 2011).That is why this study used eight experienced commercial bank in Ethiopia from nineteen banks in the country.

3.4 Data processing, Data Analysis, Data summary and presentation

Data processing is, broadly, "the collection and manipulation of items of data to produce meaningful information." In this sense it can be considered a subset of information processing, "the change (processing) of information in any manner detectable by an observer.
In this part to test the proposed hypotheses, statistical analyses carried out using the following methods: First, descriptive statistics of the variables (both dependent and independent) were calculated over the sample period. This is in line with Malhotra (2007), which states using descriptive statistics methods helps the researcher in picturing the existing situation and allows relevant information. Then, correlation analyses between dependent and independent variables were made. Finally, ordinary least square/OLS regression approach including all of its assumptions was employed. The assumptions were tested to see the applicability of the regression models developed first to test the relationship between banks credit risk and its impact on financial performance.
Data collected and summarized from different sources were listed, checked and analyzed by using Eviews 6 software package. To this end, as the number of time series data "T" is larger than number of cross-sectional units "N", there is likely to be little difference in the values of

the parameters estimated by fixed effect model/FEM and random effect model/REM (Gujarati, 2004),. Hence the choice here is based on computational convenience. On this score, FEM may be preferable if and only if the Hausman test result shows same result otherwise the REM will be applied. Since the number of time series (i.e. 11 year) is greater than the number of cross-sectional units (i.e. 8 commercial banks).

3.4.1 Expected Sign:

Expected sign is a statistical technique which shows the relationship between two variables. The positive expected sign means that one variable increase, the other variable will also increase while negative expected sign means that when one variable increase, the other variable will be decrease.

Table 3.1 Summary of explanatory variables and their expected effect on the dependent variables

Independent variables	**Proxies and Definition**	**Expected effect**
Non- performing loanRatio	NPLR: the percentage of non-performing loans overTotal Loan	Negative
Capital adequacy	CAR: the proportion of a bank's own equity in relation to its risk exposure	Positive
Bank size	BS: natural logarithm of total assets of the bank	Positive
Loan-deposit ratio	LTD: a ratio between the banks total loans and total deposits	Positive
Interest Spread	IS: the difference between interest rate on annual average loans/Lending rate and interest rate on deposits/Deposit rate)	Positive
Gross Domestic Product	GDP: growth rate of real gross domestic product	Positive
Inflation	INF: annual general inflation rate	Negative/Positive

3.4.2 Summary and Presentation

The researcher used tables, charts and graphs as well as percentages where possible because they summarize data using different types of analysis like frequency tables so that conclusions and recommendations can be drawn from them in relation to the study objectives.

3.4.3 Data Analysis

The researcher analyzed data by the use of regression and correlation analysis method. After clearly identifying the dependent and the independent variables, the researcher used multiple regression model to show the relationship between the dependent and independent variables. Then the outputs of EViews were interpreted through charts, tabular and graphics.

3.5 Study Variables

Profitability is dependent variables used in this study. It is measured in terms of ROE. Besides, explanatory variables included in this study are NPLR, Bank size, Capital Adequacy and Loan and advance to deposit ratio are those from the bank specific factors, Interest Spread from industry specific and GDP with inflation from the macroeconomic factors.

3.5.1 Dependent variable

Bank Profitability

Bank profitability may reflect the risk taking behavior of bank managements. Banks with high profitability are less over stressed for revenue creation and thus less forced to engage risk credit offering. However, inefficient banks are more likely to experience high level of problem loans since they are tempted to grant and to engage in more uncertain credits to defend their profitability and meet the prudential rules imposed by monetary authorities (Boudriga et al. 2009). Poor management can imply week monitoring for both operating cost and credit quality of customers, which will include high levels of capital losses (Haneef et al. 2012).Thus, ROE are considered as profitability indicators of bank in this study.

Measurement of Bank Performance

The efficiency of the banking system has been one of the major issues in the new monetary and financial environment. The efficiency and competitiveness of financial institutions cannot easily be measured, since their products and services are of an intangible nature. Many researchers have attempted to measure the productivity and efficiency of the banking industry using outputs, costs, efficiency and performance.

In many of the literature reviewed its explained that bank performance is represented mainly by quantifiable financial indicators. The literature on the determinants of bank performance has closely tied bank performance with profitability measures such as ROA, ROE and NIM.

Return on Assets

Ratio measuring the operating profitability of a (non-financial) firm, expressed as a percentage of the operating assets. ROA indicates a firm's ability to efficiently allocate and manage its resources but (unlike 'return on equity') ignores the firm's liabilities. Also called return on total investment (ROTI). Formula: Operating income x 100 ÷ Operating assets.

It tells how the assets of the firm are used most effectively to earn profit. Return on assets is an indicator of how profitable a company is before leverage, and is compared with companies in the same industry. Since the figure for total assets of the company depends on the carrying value of the assets, some caution is required for companies whose carrying value may not correspond to the actual market value.

Return on assets is a common figure used for comparing performance of financial institutions (such as banks), because the majority of their assets will have a carrying value that is close to their actual market value. Return on asset is not useful for comparisons between industries because of factors of scale and peculiar capital requirements (such as reserve requirements in the insurance and banking industries) (Philip Kofler, 2005). The mathematical formula for return on assets is:
Return on Assets = Net income/Total assets

Return on Equity

It is a ratio measuring stockholders' (shareholders') profitability, expressed as a percentage of the firm's net worth. ROE indicates a firm's efficiency in applying common-stockholders' (ordinary-shareholders') money. Formula: Net income ÷ Net worth.
It measures a firm’s efficiency at generating profits from every unit of shareholders’ equity (also known as net assets or assets minus liabilities).
Widely used by investors, the ROE ratio is an important measure of a company's earnings performance. The ROE tells common shareholders how effectively their money is being employed. Peer Company, industry and overall market comparisons are appropriate; however,

it should be recognized that there are variations in ROEs among some types of businesses. In general, financial analysts consider return on equity ratios in the 15-20% range as representing attractive levels of investment quality (Richard, 2015).

Return on Equity = Net Income/Shareholder's Equity

Net income is for the full fiscal year (Before dividends paid to common stock holders but after dividends to preferred stock) Shareholder's equity does not include preferred shares.

Net Interest Margin

Net interest margin (NIM) is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets. It is similar to the gross margin (or gross profit margin) of non-financial companies.

It is usually expressed as a percentage of what the financial institution earns on loans in a time period and other assets minus the interest paid on borrowed funds divided by the average amount of the assets on which it earned income in that time period (the average earning assets).

Net interest margin is similar in concept to net interest spread, but the net interest spread is the nominal average difference between the borrowing and the lending rates, without compensating for the fact that the earning assets and the borrowed funds may be different instruments and differ in volume. The net interest margin can therefore be higher (or occasionally lower) than the net interest spread.

NIM is calculated as a percentage of interest bearing assets. Net interest income equals the interest earned minus the interest paid out to customers. In particular, for a bank or a financial institution if the non-performing assets are high, their NIM will go up as the interest earning assets are that much reduced by non-performing assets.

As it was clearly explained by (AraHosna, BakaevaManzura and Sun Juanjuan, 2008) the measurement of bank performance has been developed over time. At the beginning, many banks used a purely accounting-driven approach and focused on the measurement of NI, for example, the calculation of ROA. However, this approach does not consider the risks related to the referred assets, for instance, the underling risks of the transactions, and also with the

growth of off-balance sheet activities. Thus the riskiness of underlying assets becomes more and more important. Gradually, the banks notice that equity has become the scarce resource. Thereby, banks turn to focus on the ROE to measure the net profit to the book equity in order to find out the most profitable business and to do the investment. (Gerhard .S (2002).

ROE also hinges on the capital management activities. If the banks use capital more efficiently, they will have a better financial leverage and consequently a higher ROE. Because a higher financial leverage multiplier indicates that banks can leverage on a smaller base of stakeholder‘s fund and produce higher interest bearing assets leading to the optimization of the earnings. On the contrary, a rise in ROE can also reflect increased risks because high risk might bring more profits. This means ROE does not only go up by increasing returns or profit but also grows by taking more debt which brings more risk. Thus, positive ROE does not only represent the financial strength. Risk management becomes more and more significant in order to ensure sustainable profits in banks. (AraHosna, BakaevaManzura and Sun Juanjuan, 2009).

Smirlock (1985), Civelec and Al-Almi (1991), Agu (1992) and Chirwa (2001). Gilbert (1984) in a survey of literatures argued that bank profit is an appropriate measure of bank performance and criticize average interest rate and average service charge rates as poor measures of bank performance. On the other front, different researchers assessed performance in terms of bank prices (as measured by interest rates) rather than bank profitability. The justification as explained by Berger (1989) in Chirwa (2001) is that the use of price-concentration relationship instead of profit concentration relationship measures the performance of banks and their market structure. They argued that the price-concentration relationship imply that high levels of concentration allow for noncompetitive behavior that would result in lower interest rates given to depositors and/or higher lending rates to browsers. However, as explained in Chirwa (2001), Molynex and Forbes (1995) argued that price measures of performance create problems of cross subsidization of multi-product firm.

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), mangers lack competencies to effectively assess and control risks incurred when lending to new customers. Godlewski (2004) is using the adjusted ROA as a proxy for performance, shows that banks profitability negatively impacts the level of nonperforming loans ratio. Garciya-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 it should 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. On the other hand tightening of the risk management process and arrange appropriate monitoring procedure for financing against high risk securities and projects and keep an eye on NPLs.

Relationship between Credit Risk Management and Bank Performance

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

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

Return on Equity (ROE): represents the rate of return received from equity invested in banks. It is the amount of net income returned as a percentage of shareholders equity. Return on equity measures profitability by revealing how much profit a bank can generates with the money shareholders have invested. Thus, ROE measures how much the bank is earning on their equity investment.

ROE is commonly used to measure the profitability of banks. The efficiency of the banks can be evaluated by applying ROE, since it shows that banks reinvest its earnings to generate future profit. The growth of ROE may also depend on the capitalization of the banks and operating profit margin. If a bank is highly capitalized through the risk weighted capital adequacy ratio (RWCAR) or Tier 1 capital adequacy ratio (CAR), the expansion of ROE will be retarded. However, the increase of the operating margin can smoothly enhance the ROE. ROE also hinges on the capital management activities. If the banks use capital more efficiently, they will have a better financial leverage and consequently a higher ROE. Because a higher financial leverage multiplier indicates that banks can leverage on a smaller base of stakeholder's fund and produce higher interest bearing assets leading to the optimization of the earnings. On the contrary, a rise in ROE can also reflect increased risks because high risk might bring more profits. This means ROE does not only go up by increasing returns or profit but also grows by taking more debt which brings more risk. Thus, positive ROE does not only represent the financial strength. Risk management becomes more and more significant in order to ensure sustainable profits in banks (Hosna, 2009).

Because of these listed reasons the researcher used ROE to measure the financial performance of banks in Ethiopia. It is measured by the ratio of net profit to total equity.

$$ROE = \frac{\text{Net profit}}{\text{Total equity}}$$

3.5.2 Independent Variables

Nonperforming Loan Ratio (NPLR)

Brewer et al. (2006) regards non-performing loan ratio (NPLR) as a significant economic indicator. It implies that lower NPLR is related with the lower risk and deposit rate. Meanwhile,

there might be a positive relationship between deposit rate and NPLR based on the possibility that bank's deposit base will be increased by the high deposit rate for funding high risk loans. And the increasing high-risk loans might enhance the probability of higher NPLR. So that the allocation of banks risk management deeply relies on the diversification of credit risk to decrease the NPL amount. NPL is also a probability of loss which requires provision. The amount of provision is "accounting amount" which can be further subtracted from the profit. Thus high NPL increases the provision while reduces the profit.

Non-performing loan over total assets shows the level of banks' exposure to credit risk. If the ratio goes above 25%, is an indication that the bank is getting into the zone of weak credit risk control system (Agborade 2002).

Deterioration in asset quality is much more serious problem of bank unless the mechanism exists to ensure the timely recognition of the problem. It is a common cause of bank failure. Poor asset quality leads nonperforming loan that can seriously damage a banks' financial position having an adverse effect on banks operation (Lafunte, 2012). It distresses the performance and survival of banks (Mileris, 2012).It is measured or indicated by the amount of NPLs to Total Loan.

$$NPLR=\frac{NPLs}{\text{Total Loan}}$$

Capital Adequacy Ratio (CAR)

Capital Adequacy Ratio (CAR) is basically the proportion of the bank's tier 1& tier 2 equity (Qualifying Capital or Equity) as a proportion of its risk weighted assets (loans). It is the proportion of a bank's own equity in relation to its risk exposure.
CAR helps regulators protect depositors from banks who lend aggressively and in doing so do not get back most of the money lent. This is because when a bank makes large loan losses that wipe out its total equity, it may lead to an immediate bankruptcy thus making depositors lose their money.

NBE has set specific measure of the capital adequacy position of Banks, which is the ratio the Capital Adequacy Ratio (CAR) (Directive No. SBB/9/95). The directive clearly set out the

computation mechanism and the conversion factors for both on and off-balance sheet items and strictly set for all banks not to maintain their capital level below 8% of their risk weighted assets. Regardless of such regulatory framework, the major intention of holding capital is to build the internal strength of the bank to withstand losses during crisis (Dang, 2011). However some authors argue that capital also affects performance via creating liquidity, hence banks with strong capital position are able to reduce their financing costs, for example by paying low interest rates on their debt (Diamond, 2000). However, holding high capital level is not without drawbacks: a higher CAR ratio reduces the ROE due to two mechanisms: A high ratio indicates a lower risk, and the theory of markets to balance advocating a strong relationship at risk and profitability would lead us to infer a lower profitability.

The research of Boudriga, Taktak&Jellouli (2009) illustrates this research found that CAR seems to reduce the level of problem loans which means higher CAR leads to less credit exposures. However, Rime (2001) observed a positive relationship in his research between bank risk and capital ratio of Swiss banks during the period 1989-1995. Goddard et al. (2004) study the influential factors of profitability of banks in Europe. They found a positive relationship between the CAR (bank capital and reserves to total assets) (The World Bank, 2014) and profitability. And Samy and Magda (2009) investigate the effects of capital regulations on the performance of banks in Egypt. The research provides a comprehensive framework to measure the impact of capital adequacy on two indicators of bank performance: cost of intermediation and profitability. The result of the research indicates that higher capital adequacy "increase the interest of shareholders in managing bank's portfolio" which generates "higher cost of intermediation and profitability" (Samy and Magda, 2009, p. 70).

Capital adequacy is a measure of bank`s financial strength since it shows the ability to withstand/ tolerate with operational and abnormal losses. It also represents the ability to undertake additional business (Habtamu, 2012). As noted by Makri et al.(2014), CAR determines risk behavior of banks. It is a measure of banks solvency and ability to absorb risk. Thus, this ratio is used to protect depositors and promote stability and efficiency of financial systems. It is measured by total Equity to total asset ratio.
The ratio of equity to total assets is considered one of the basic ratios for capital strength. It is expected that the higher this ratio, the lower the need for external funding and the higher the profitability of the bank. It shows the ability of bank to absorb losses and

handle risk exposure with shareholder. Equity to total assets ratio is expected to have positive relation with performance that well-capitalized banks face lower costs of going bankrupt which reduces their costs of funding and risks (Berger, 1995; Bourke,1989; Hassan and Bashir, 2003).

$$CAR = \frac{\text{Total Equity}}{\text{Total Asset}}$$

Loan and advance to deposit ratio (LTDR)

Loan-deposit ratio, also known as the LTD ratio, is a ratio between the banks total loans and total deposits. If the ratio is lower than 1, the bank relied on its own deposits to make loans to its customers, without any outside borrowing. If, on the other hand, the ratio is greater than 1, the bank borrowed money which it relined at higher rates, rather than relying entirely on its own deposits. Banks may not be earning an optimal return if the ratio is too low. If the ratio is too high, the banks might not have enough liquidity to cover any unforeseen funding requirements or economic crises. It is a commonly used statistic for assessing a bank's liquidity.

The formula for the loan to deposit ratio is exactly as its name implies, loans divided by deposits. The loan to deposit ratio is used to calculate a lending institution's ability to cover withdrawals made by its customers. 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 monies needed can be accessed in the short term.
The study conducted by Rengasamy, 2014 attempt to evaluate the impact of LDR on ROA for locally owned commercial banks in Malaysia for the period of five years from 2009 to2013. In general the study indicates that there was a positive impact on LDR to the profitability (ROA) of the banks.

To measure banks liquidity this research paper employed Loan to Deposit Ratio. This ratio indicates the ability of banks to withstand deposit withdrawals and willingness of banks to meet loan demand by reducing their cash assets. When the banks are more liquid, they can reduce risk of insolvency. This ratio provides more general information on the issue deposit because it takes no account the mix between

time and demand deposit, and other issues. Even so, LTDR can be used as useful tools for assessing Banks liquidity.

$$\text{LTDR} = \frac{\text{Total Loan and Advance}}{\text{Total Deposit}}$$

Bank Size (BS)

Bank size (LOGTA) is generally used to capture potential economies or diseconomies of scale in the banking sector. This variable controls for cost differences in product and risk diversification according to the size of the financial institution. The first factor could lead to a positive relationship between size and bank profitability, if there are significant economies of scale (Akhavein et al. 1997; Bourke 1989; Molyneux and Thornton 1992; Bikker and Hu 2002; Goddard et al. 2004), while the second to a negative one, if increased diversification leads to lower credit risk and thus lower returns. Other researchers however conclude that marginal cost savings can be achieved by increasing the size of the banking firm, especially as markets develop (Berger et al. 1987; Boyd and Runkle 1993; Miller and Noulas 1997; Athanasoglou et al. 2007). Eichengreen and Gibson (2001) suggest that the effect of a growing bank's size on profitability may be positive up to a certain limit. Beyond this point the effect of size could be negative due to bureaucratic and other reasons. Hence, the size-profitability relationship may be expected to be non-linear.

Another part of the literature has been interested in the analysis of the theoretical arguments based on the relationship between the bank size and bank risk-taking. It suggests a negative relationship between these two variables. Such a relationship is justified by the most natural argument that is diversification by size. Indeed, larger banks are expected to have lower risks because they have the capability of holding more diversifiable portfolios. In this respect, many researches have been conducted. According to the researches of Saunders et al. (1990), Chen et al. (1998), Cebenoyan et al. (1999) and Megginson (2005), there is a negative relationship between bank risk and bank size. They explain this result by the fact that larger banks are likely to be more skilled in risk management and have also better diversification opportunities. Thus, we expect to find that the bank size is negatively related to the level of risk.

Bank size as measured by total deposits (Civelic and Al-Alami (1991) or assets (Smirlock (1985) is one of the control variables used in analyzing performance of the

bank system. This is included to control for the possibility that large banks are likely to have greater product and loan diversification. The impact of bank size on profitability is uncertain aprior for the fact that on the one hand, increased diversification implies less risk and hence a lower required return, and on the other hand, bank size takes into account differences brought about by size such as economies of scale. For large firms their size permits them to bargain more effectively, administer prices and in the end realize significant higher prices for the particular product, (Agu, 1992).

In most finance literature, total assets of the banks are used as a proxy for bank size. Bank size is represented by natural logarithm of total asset (LNTA). The effect of bank size on profitability is generally expected to be positive (Smirlock, 1985).

Bank size= LN (TA)

Interest Rate Spread (IS)

Interest rate spreads arise out of the core functions of financial institutions most especially the commercial banks which include lending and deposits taking. As banks lend, they charge interest and for attracting deposits, they offer interest on deposit as compensation for their clients' thriftiness and the difference between the two rates forms the spread (Hamis 2010).

The spread between the nominal lending and deposit rates in the industry is low, while real lending and deposit rates are currently negative. However, the commencement of interest rate on demand deposits, the differentiated interest rates on saving and time deposits, the increasing trend in interest rate of average time deposits since 2002, and the concomitant marginal decline in the interest rate spread somewhat indicate improvements in competition, though not intense, among commercial banks, especially in mobilizing deposits to avail adequate funds for the growing demand for loans. It may seem a truism to deduce that there is no vigorous price competition in the Ethiopian banking industry. Price is not yet set based on demand and supply forces over the review period (Zerayehu et al, 2013).

The theoretical model of Ho and Saunders (1981) expanded by Angbazo (1997) and Maudos and Guevara (2004) indicate that there is a positive correlation between credit risk or loan quality and interest rate spreads. The model argues in part that when banks are faced by deterioration in loan quality (credit risk), they hedge against the impending loss by transferring a portion or all of it to their customers (either borrowers or depositors). This is done by increasing the lending rate and or lowering the deposit rate.

Interest spread is the difference between the average lending rate and the average

borrowing rate for a bank or other financial institution. It is:

IS= (interest income ÷interest earning assets) - (interest expense ÷interest bearing liabilities)

This is very similar to interest margin. If a bank's lending was exactly equal to its borrowings (i.e. deposits plus other borrowing) the two numbers would be identical. In reality, bank also has its shareholder's funds available to lend, but at the same time its lending is constrained by reserve requirements.

Gross Domestic Product (GDP)

The real GDP is the sum of the value added in the economy during a given period or the sum of incomes in the economy during a given period adjusted for the effect of increasing prices (Daferighe&Aje, 2009). Nominal GDP is the determination of GDP without taking into account other factors or variables such as inflation (Business Dictionary, 2013). Nominal GDP increases overtime for two reasons (Daferighe&Aje, 2009). The first is that the production of most goods increases overtime. The second is that the naira price of most goods increases overtime. For instance, in a study by Ugbede, Otache and Umar (2012) on the impact of Commercial Banks Credit on Nigeria's GDP they discovered that Commercial banks credit has a high positive impact on the nation's GDP meaning the higher the volume of Commercial banks credit made available, the higher the corresponding GDP. This conclusion fails to take into cognizance the effect of inflation which is a great consequence. For example, their study revealed that there was an outrageous increase in GDP between 1980 (₦31,547m) and 1981(₦205,213m). Within this period, the CBN Report (2007) has it that inflation rate rose from 9.9 percent to 20.9 percent which is an increase of about 111percent. Therefore the increment in GDP to some extent is accountable by rise in price (inflation) In order to measure production and its change overtime, the effect of increasing prices need to be eliminated. The foregoing presupposes that in the determination of GDP growth from one year to another, real GDP give a more accurate view of the economy. Hence, this study focuses on real GDP rather than the nominal GDP in this study.

Two different approaches are used to calculate GDP. In theory, the amount spent for goods and services should be equal to the income paid to produce the goods and services, and other costs associated with those goods and services. Calculating GDP by adding up expenditures is called the expenditure approach, and computing GDP by examining income for resources (sometimes referred to as gross domestic income, or GDI, is known as the resource cost/income approach.

Most of the studies under review use GDP growth rates as the main indicator of macroeconomic conditions and debt sustainability of wide group of borrowers. An increase in GDP growth rates translates into higher income and improves debt servicing capacity of borrowers, which results in lower credit risk of banks (Anna, 2013).

Inflation (INF)

The effect of inflation is also another important determinant of banking performance, but its impact is not clear. Higher inflation can make debt servicing easier by reducing the real value of outstanding loans. However, it can also weaken borrowers' ability to service debt by reducing their real income. Therefore, the relationship between inflation and credit risk can be positive or negative

In general, high inflation rates are associated with high loan interest rates and thus high income. Perry (1992), however, asserts that the effect of inflation on banking performance depends on whether inflation is anticipated or unanticipated. Athanasoglou et al., 2005, state in relation to the Greek situation that the relationship between inflation level and banks profitability is remained to be debatable. The direction of the relationship is not clear (Vong and Chan, 2009).

High inflation rates are generally associated with a high loan interest rate. Thus, high interest rate increases cost of borrowing, which lead to an increase in the obligation of borrowers resulting in an increase in the credit risk (Ravi, 2013).

The inflation rate is widely calculated by calculating the movement or change in a price index, usually the consumer price index. The inflation rate is the percentage rate of change of a price index over time. The Retail Prices Index is also a measure of inflation that is commonly used in the United Kingdom. It is broader than the CPI and contains a larger basket of goods and services (Olivier, 2000).

Moreover, macroeconomic indicators can also influence bank risks. These indicators are those at the origin of banking crises: inflation rate of growth GDP, interest rate and exchange rate. In this setting, many researches have been conducted to analyse the

relationship between these indicators and the occurrence of banking crises. The findings in this respect indicate that there is a close relationship between macroeconomic indicators and banking crises and excessive risk (Angeloni and al (2009), Olga Bohachova (2008), Buch and al (2010). We will test if these variables influence the levels of credit risk in the Tunisian context.

3.6 Model Specification

The aim of this study is to examine the impact of credit risk management on financial performance of Banks in Ethiopia. Similar to the most noticeable previous research works conducted on the impact of credit risk on banks profitability, this study used ROE as dependent variables whereas NPL Ratio, Bank Size, Capital Adequacy ratio, Loan to Deposit ratio, Interest spread rate, GDP and inflation rate are used as an explanatory variables. These variables were chosen since they are widely existent for the commercial bank in Ethiopia. Accordingly, this study examined the impact of Credit risk by testing those listed variables on Banks profitability of commercial banks in Ethiopia by adopting a model that is existed in most literatures.

The nature of data used in this study enabled the researcher to use a panel/longitudinal data model which is deemed to have advantages over cross sectional and time series data methodology. Panel data involves the pooling of observations on the cross-sectional over several time periods. As Brook (2008) stated the advantages of using panel data set; first and perhaps most importantly, it 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.

Second, it is often of interest to examine how variables, or the relationships between them, change dynamically (over time). To do this using pure time-series data would often require a long run of data simply to get a sufficient number of observations to be able to conduct any meaningful hypothesis tests. But by combining cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of the test, by employing information on the dynamic behavior of a large number of entities at the same time. The additional variation introduced by combining the data in this way can also help to mitigate problems of multicollinearity that may arise if time series are modeled individually.

Finally, by structuring the model in an appropriate way, we can remove the impact of certain forms of omitted variables bias in regression results. Thus, the general panel/longitudinal regression model was as follows:

$$yi\ t = \alpha + \beta xi\ t + ui\ t$$

With subscript i denote the cross-section and t representing the time-series dimension. The left-hand variable yi t is the dependent variable, α is the intercept term, β is a k×1 vector of parameters to be estimated on the explanatory variables, and xi t is a 1 × k vector of observations on the explanatory variables, t = 1, . . . , 11 ; i = 1, . . . , 8.

Therefore the general models which incorporate all of the variables to test the hypotheses of the study were:

$$\boldsymbol{ROEi, t = \alpha + \beta 1 NPLRi, t + \beta 2 CARi, t + \beta 3 LTDRi, t + \beta 4 BSi, t + \beta 5 IS, t + \beta 6 + \beta 7 INFt + ui, t}$$

Where;

$\boldsymbol{ROEi, t}$ is the Return on Equity of ith bank at year t

NPLRi, t is Nonperforming loan ratio of ith bank at year t

CARi, t is the Capital Adequacy Ratio of ith bank at year t

LTDRi, t is the Loan to Deposit Ratio of ith bank at year t

BS i, is Bank Size of ith bank at year t

IS, t is the average Interest rate Spread of banks at year t

GDPt is Gross Domestic product of the country at year t

INFt is inflation rate of the country at year t

Finally, regression results were presented in a tabular form with the appropriate test statistics and then an explanation of each parameter were given in line with the evidence in the literatures.

Furthermore, various diagnostic tests such as normality, heteroscedasticity, autocorrelation and multicolinearity test were conducted to decide whether the model used in the study is appropriate and fulfill the assumption of classical linear regression model.

Normality Test:

The Classical Linear Regression Model (CLRM) assumes that the error term is normally distributed with the mean of error being zero as positive error will offset the negative error. The normality of error term can be examined through informal way which is using the graph

to detect the pattern of the residual or the formal way is the Jarque-Bera test statistics.

The Jarque-Bera test statistics requires the value of skewness and kurtosis in the model in order to calculate the Jarque-Bera test statistics value. Other than that, the researchers also can use Jarque-Bera p-value to determine the result.

In null hypothesis, the assumption will be the error term is normally distributed. So, if the p-value of JB-statistic is greater than $\alpha=0.05$, we should not reject the null hypothesis.

Heteroscedasticity:

Heteroscedasticity is the econometric problem where there is omission of reasonable independent variable that originally should be included into the model. It occurs when the variance of error term is not constant across the number of observations. The researchers have to make sure that the model is free from heteroscedasticity to obtain a precise and interpretable result. A hypothesis test is carried out using Eview 6 with Breusch-Pagan test and p value is obtained to detect the heteroscedasticity problem. If the obtained p-value more than 5% significance level, it implies that the model does not have heteroscedasticity problem.

Autocorrelation:

Autocorrelation, also known as serial correlation or cross-autocorrelation, is the cross-correlation of a signal with itself at different points in time (that is what the cross stands for). Informally, it is the similarity between observations as a function of the time lag between them. It is a mathematical tool for finding repeating patterns, such as the presence of a periodic signal obscured by noise, or identifying the missing fundamental frequency in a signal implied by its harmonic frequencies. It is often used in signal processing for analyzing functions or series of values, such as time domain signals.

Autocorrelation problem will occur when error term at the period t is correlated with the error term at period before t. Autocorrelation is most likely to happen in the time series data due to the importance of the sequence of the time period.

In this research The Breusch–Godfrey serial correlation LM test is used to test autocorrelation. It is a test for autocorrelation in the errors in a regression model. It makes use of the residuals from the model being considered in a regression analysis, and a test statistic is derived from these. The null hypothesis is that there is no serial correlation of any order up to p.

The test is more general than the Durbin–Watson statistic (or Durbin's h statistic), which is only valid for non-stochastic repressors and for testing the possibility of a first-order autoregressive model for the regression errors. The BG test has none of these restrictions, and is statistically more powerful than Durbin's statistic.

Multicollinearity:

Multicollinearity (also collinearity) is a phenomenon in which two or more predictor variables in a multiple regression model are highly correlated, meaning that one can be linearly predicted from the others with a non-trivial degree of accuracy. In this situation the coefficient estimates of the multiple regression may change erratically in response to small changes in the model or the data. multicollinearity does not reduce the predictive power or reliability of the model as a whole, at least within the sample data set; it only affects calculations regarding individual predictors. That is, a multiple regression model with correlated predictors can indicate how well the entire bundle of predictors predicts the outcome variable, but it may not give valid results about any individual predictor, or about which predictors are redundant with respect to others.

There are various methods to detect multicollinearity. Firstly, by comparing the expected sign of independent variables obtained from the model with prior expectation. It is possible that multicollinearity problem exists in the model if the expected sign for independent variable is inconsistent with theory or prior expectation. Secondly, by examining the correlation matrix provided by Eviews 6. If the researchers found that there is any correlation between two variables to be more than 80%, automatically the suspicions for the existence of muliticolinearity problem is derived. Besides, multicollinearity problem can be detected by viewing the estimated model has high R-square but with only few or no independent variables found to have significant effect on the dependent variable besides there is high-pair wise correlation between two independent variables.

R-squared:

R-Squared, also known as coefficient of determination which is a statistical term saying how good one term is at predicting another. The higher the value of R-Square, the better is the prediction of one term from another said by Cameron, &Windmeijer (1996).

CHAPTER FOUR

4 RESULTS AND DISCUSSION

Introduction

So far important literatures relating to the topic were reviewed and that gives enough understanding about the topic and used to identify knowledge gap on the area. To meet the broad research objective and to answer research questions and to test research hypotheses under it the research design used for this study also discussed in the preceding chapter. In this chapter the data collected were presented and important correlation and regression analysis findings were discussed.

This chapter has five sections. In the first chapter section 4.1, the descriptive statistics of the data has been described, next in section 4.2 correlation analysis had been conducted, and under section 4.3 the test for the classical liner regression model/CLRM are presented. Then, the results of the regression analysis were presented under section 4.4. Finally, discussions for the results of the regression analysis were made under section 4.5 part of this chapter.

4.1 Descriptive statistics of the data

The descriptive statistics for the dependent and independent variables are presented below. The dependent variable is financial performance measured by ROE and others are the independent variables they are: Nonperforming Loan Ratio, Capital Adequacy, Loan to Deposit, Bank Size, Interest spread, real GDP growth and Inflation.
In order to give a brief overview of our data, we present the following Table 4.1 which contains the descriptive statistics of our variables of commercial banks in Ethiopia from 2003 to 2013. From the histogram of all the variables, we assume that all the variables follow a normal distribution.

Table 4.1 Descriptive Statistics of Dependent and Independent Variables

	Mean	Median	Maximum	Minimum	Std.Dev.	Observations
ROE	0.243041	0.238778	0.566192	0.040268	0.08572	88
NPLR	0.007058	0.003028	0.056704	1.38E-05	0.010754	88
CAR	0.112653	0.110708	0.19403	0.04201	0.035696	88
LTDR	0.691493	0.678087	1.211716	0.29687	0.191772	88
BS	13.83237	4.813364	197.1042	0.469	30.48385	88
IS	0.069565	0.0695	0.076299	0.063011	0.004175	88
GDP	0.097455	0.112	0.126	-0.021	0.039108	88
INF	0.164455	0.135	0.364	0.028	0.106863	88

Source: The Researcher computation through Eviews 6

ROE measured by Net Profit divided by Total Owners Equity ranges from 4.03- 56.62 %. It has a mean value of 24.3% showing relatively the lowest deviation of 8.57 % from its mean value.

This indicates that Commercial banks in Ethiopia earn 24.3% return on averages from the equity per year. According to Richard (2015), Return on equity between 15% and 20% are considered desirable, the average industry mean value of 24.3% return on equity tells that the banking industry is the area where it makes good profit. Nevertheless, literature of Navapan and Tripe (2003) doubts that getting this much return on equity may not always send a good message, but it may also result from having a small, inefficient and less competitive market.

The mean value of NPLR of 0.7 % indicate that the average ratio of NPL over total Loan is less than 1%. The maximum amount of this ratio is 5.67% which is incurred in year 2003. As banks only pass 25% in getting into the zone of weak credit risk control system (Agborade 2002), the industry in general not reaching to that stage. The standard deviation of 1.07% also indicate that there is no that much variation among banks credit risk exposures.

CAR also measured by total equity divided by total assets having a minimum of 4.2% and maximum of 19.4% with a mean value and standard deviation of 11.26% and 3.57% respectively. This indicates that CAR for the sample commercial banks in Ethiopia during study period was above the minimum requirement, which is 8%.

LTD ratio with the minimum and maximum value of 29.68 and 121.17% respectively with the average value of 69.15% has a relatively large deviation from the mean by 19.18% among the bank specific independent variables. In this respect, Willem (2013) mentioned that there is no international limit for the amount of LTDR ratio though some countries required a limit to this ratio.

The ratio more the 100% is abnormal but indicated a maximum 121.17% in CBB in year 2006 may result from the government other plan and activities as CBB is one of the banks which is owned by state.

The last bank specific determinant is Bank Size which has a mean value 13.83 billion Birr with the standard deviation of 30.48. The maximum and minimum values were 197.1billion and half a billion respectively. The standard division indicated in Table 4.1 with a value of 30.48 is the maximum from all other variables. This implies that there is a huge difference between the biggest bank and the small bank. Gibson (2001) suggest that the effect of a growing bank's size on profitability may be positive up to a certain limit. Therefore those banks which has a big size have an advantage of absorbing some credit risks.

Interest Spread on average was 6.95% with the standard deviation of 0.41% which is much less than 1% deviation from the mean. The maximum and minimum interest spread was 7.63% and 6.30% respectively. This could be due to the government set the minimum rate and the majority banks are similar with this rate. In addition, as banks have sufficient demand for loan, banks do not yet start computing each other by interest rate.

The third group of independent variables were the macroeconomic indicators that can affect banks profitability over time. The mean value of real GDP growth rate was 9.74% indicating the average real growth rate of the country's economy over the past 11 years. The maximum growth of the economy was recorded in the year 2005 (i.e. 12.6%) and the minimum was in the year 2003 (i.e. -2.1%). Since the year 2003 the country has been recording double digit growth rate with little dispersion towards the average over the period under study with the standard deviation of 3.91%.

The average inflation rate of the country for the period of this study from 2003 to 2013 was 16.44 over the past 11years and this was more than from the average GDP (i.e. 9.74%). The maximum inflation was recorded in the year 2009 (i.e. 36.4%) and the minimum was in the year 2010 (i.e. 2.8 %). The rate of inflation was highly dispersed over the periods under study towards its mean with standard deviation of 10.68%.

4.2 Correlation analysis

Correlation analysis measures the relationship between two items. The resulting value (called the "correlation coefficient") shows if changes in one item will result in changes in the other item (e.g., the security's price). Correlation is a way to index the degree to which two or more variables are associated with or related to each other.

Table 4.2 Correlation matrix among dependent and independent variables

	ROE	NPLR	CAR	LTDR	BSLN	IS	GDP	INF
ROE	1	-0.52407	-0.53191	-0.33210	0.67592	-0.13228	0.31064	0.12564
NPLR	-0.52407	1.0000000	-0.06109	0.51496	-0.60286	0.17590	-0.48596	-0.30966
CAR	-0.53191	-0.06109	1	0.24906	-0.35432	-0.06641	0.00750	0.15169
LTDR	-0.33210	0.51496	0.24906	1	-0.77116	0.18582	-0.11320	-0.18051
BSLN	0.67592	-0.60286	-0.35432	-0.77116	1	-0.27268	0.19951	0.27605
IS	-0.13228	0.17590	-0.06641	0.18582	-0.27268	1	-0.06167	-0.19107
GDP	0.31064	-0.48596	0.00750	-0.11320	0.19951	-0.06167	1	-0.00634
INF	0.12564	-0.30966	0.15169	-0.18051	0.27605	-0.19107	-0.00634	1

Source: The Researcher computation through Eviews 6

According to Brooks (2008), if it is stated that y and x are correlated, it means that y and x are being treated in a completely symmetrical way. Thus, it is not implied that changes in x cause changes in y, or indeed that changes in y cause changes in x rather, it is simply stated that there is evidence for a linear relationship between the two variables, and that movements in the two are on average related to an extent given by the correlation coefficient.

The above table 4.2 shows that NPLR, CAR, LTDR and IS are negatively correlated with ROE while Bank size, GDP and Inflation are positively correlated. In addition NPLR, CAR and Bank Size have a value between 50-75%, therefore they are a medium correlated to the dependent variable. On the other side LTD, IS, GDP and INF have less than 50% value and this indicates that they are weekly correlated to the dependent variable.

4.3 Testing assumptions of classical linear regression model (CLRM)

In this part of the research paper, the linearity of the parameter is assumed since the model applies linear ordinary least square (OLS). The objective of the model is to predict the strength and direction of association among the dependent and independent variables. Thus, in order to maintain the validity and robustness of the regression result of the research in CLRM, it is better to satisfy basic assumption CLRM.

When these assumptions are satisfied, it is considered as all available information is used in the model. However, if these assumptions are violated, there will be data that left out of the model (Brooks, 2008). Accordingly, before applying the model for testing the significance of the slopes and analyzing the regressed result, normality, multicolinearity, autocorrelation and heteroscedasticity tests are made for identifying misspecification of data if any so as to fulfill research quality.

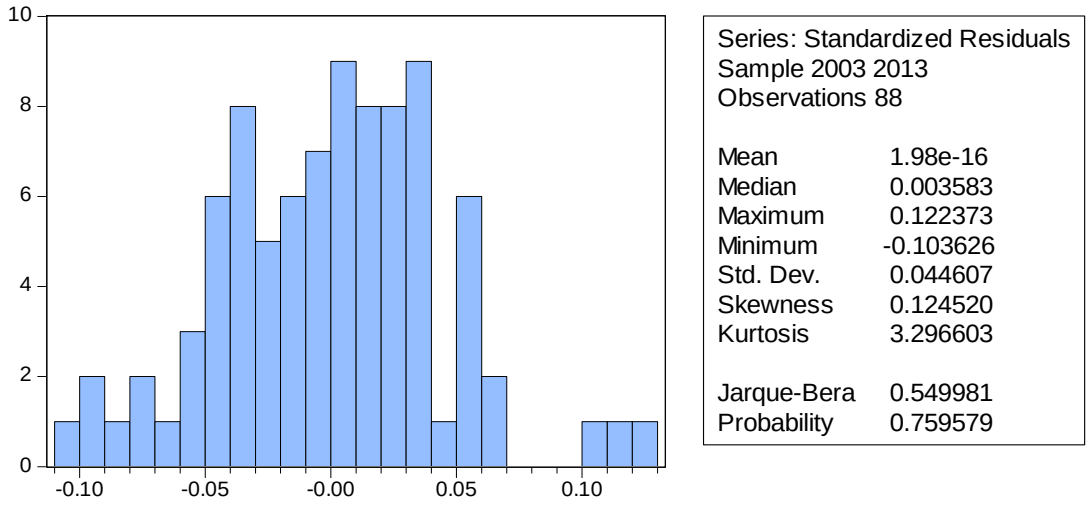
4.3.1 Test for average value of the error term is zero (E (ut) = 0) assumption

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. Therefore, since the constant term (i.e. α) was included in the regression equation, the average value of the error term in this study is expected to be zero.

4.3.2 Normality Test

The second important diagnostic test conducted in this paper is the normality assumption (i.e the normally distributed errors). Brooks (2008) stated that the normality assumption '(ut~ N (0, σ2))' is required in order to conduct single or joint hypothesis tests about the model parameters. One of the most commonly applied tests for normality is the Jarque-Bera(JB) test. JB uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments - the mean and the variance (Brooks, 2008, p.161). In case of this study, the researcher used JB normality test to test the null hypothesis of normally distributed errors assumptions.

Fig 4.1 Jarque-BeraNormality Test



Source: The Researcher computation through Eviews 6

As shown in the histogram in the appendix here above, kurtosis is around 3 (i.e. 3.296603), the Histogram statistics was not significant at 5% (i.e. 0.759579). Hence, the null hypothesis that is the error term is normally distributed should not be rejected and the error term in all of the cases follows the normal distribution and skewed to the right.

4.3.3 Heteroscedasticity Test

Among the OLS assumptions, one of the diagnostic test which is conducted in this study is heteroscedastic test. This theoretically expressed as by Brooks (2008, p.133) ‘’var (ut) = σ2 < ∞; it has been assumed that the variance of the errors is constant, σ2 .In the classical linear regression model, one of the basic assumptions is Homoskedasticity assumption that states as the probability distribution of the disturbance term remains same for all observations. That is the variance of each u i is the same for all values of the explanatory variable. However, if the disturbance terms do not have the same variance, this condition of non-constant variance or non-homogeneity of variance is known as heteroscedasticity (Bedru and Seid, 2005).

Accordingly, in order to detect the heteroscedasticity problems, Breusch-Pagan test was utilized in this study. This test states that if the p-value is significant at 95 confidence interval, the data has heteroscedasticity problem, whereas if the value is insignificant (greater than 0.05), the data has no heteroscedasticity problem.

Appendix 1:Hetrskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.448729	Prob. F(7,80)	0.1978
Obs*R-squared	9.900226	Prob. Chi-Square(7)	0.1943
Scaled explained SS	9.169166	Prob. Chi-Square(7)	0.2407

Source: The Researcher computation through Eviews 6

Thus, as shown in appendix1, there is no heteroscedasticity problem for this study hence the p- value is 19.43% showing insignificant value assumption of homoscedasticity.

4.3.4 Autocorrelation Test

The other important diagnostic test which is performed in this research is autocorrelation test. This assumption of OLS theoretically expressed by the numbers of scholars like Brooks (2008) and Verbeek (2004). The test for autocorrelation was made by using Breusch–Godfrey serial correlation LM and according to Appendix 2 the probability shows 0.6256 and which is above 5%.

APPENDIX-2 Autocorrelation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.420237	Prob. F(2,78)	0.6584
Obs*R-squared	0.938118	Prob. Chi-Square(2)	0.6256

Source: The Researcher computation through Eviews 6

As a result, the conclusion from thetest the null hypothesis of no autocorrelation should not be rejected since the value of p is greater than 0.05 at 95% confidence interval.

4.3.5 Multicolinearity Test

The other test which is conducted in this study is the multicolinearity test, this help to identify the correlation between explanatory variables and to avoid double effect of independent variable from the model. The next table, described correlation among explanatory variables.
A correlation is a single number that describes the degree of relationship between two variables.

According to Gujarati (2004), the standard statistical method for testing data for multicollinearity is analyzing the explanatory variables correlation coefficients (CC); condition

index (CI) and variance inflation factor (VIF). Therefore, in this study correlation matrix for seven of the independent variables shown below in the table had been estimated.

Table 4.3 Correlation Matrix of Explanatory Variables

	NPLR	CAR	LTDR	BSLN	IS	GDP	INF
NPLR	1	-0.06109	0.514962	-0.60286	0.175901	-0.48596	-0.30966
CAR	-0.06109	1	0.249058	-0.35432	-0.06641	0.007502	0.151686
LTDR	0.514962	0.249058	1	-0.77116	0.185818	-0.1132	-0.18051
BSLN	-0.60286	-0.35432	-0.77116	1	-0.27268	0.199507	0.276048
IS	0.175901	-0.06641	0.185818	-0.27268	1	-0.06167	-0.19107
GDP	-0.48596	0.007502	-0.1132	0.199507	-0.06167	1	-0.00634
INF	-0.30966	0.151686	-0.18051	0.276048	-0.19107	-0.00634	1

Source: The Researcher computation through Eviews 6

The results in the above correlation matrix show that the highest correlation of 0.7712exist between bank size and loan to deposit ratio.Based on the result indicated in table 4.3, the researcher proves there is no multicolinearity problem in this study as there is no any correlation among the explanatory variables which is more than 80%.

Choosing Random effect (RE) versus fixed effect (FE) models

The appropriate test used to decide whether fixed effect or random effect model was Hausman Specification Test. Thus, Hausman Specification Test identifies whether fixed-effects or random-effect model is most appropriate to the model. The null hypothesis of Hausman Test is use Random effect model, while if it is rejected Fixed Effect model is appropriate.

APPENDIX-3 Hausman Test

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

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.054800	2	0.1317
Period random	5.453228	2	0.0654
Cross-section and period random	9.616965	2	0.0082

Source: The Researcher computation through Eviews 6

Thus, as shown in Appendix3, the Hausman specification test for this study has a p-value of 0.1317 for the regression models. This indicates that p-value is insignificant and then the null hypothesis is not rejected and Random effect model is appropriate for the given data set in this study.

4.4 Multiple Regression Analysis

This section presents over all the empirical results of the regressions. The regression result was made and coefficients of the variables were estimated by EView software version 6. As stated earlier in this study Random Effect regression model is used and it is an appropriate based on Hausman test. Thus, the Random effect model used to examine the impact of credit risk management on profitability of commercial banks in Ethiopia:

Table 4.4 Multiple Variables Regression Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.885312	0.284457	-3.112289	0.0026
NPLR	-3.236771	0.734788	-4.405038	0.0000***
CAR	-0.991556	0.200244	-4.951742	0.0000***
LTDR	0.252548	0.043306	5.831731	0.0000***
BSLN	0.048750	0.009549	5.105469	0.0000***
IS	-0.114296	1.607585	-0.071098	0.9435
GDP	0.088086	0.183409	0.480270	0.6323
INF	-0.023662	0.065419	-0.361701	0.7185

Source: The Researcher computation through Eviews 6

Notes1 : R2 = 0.601836; Adj R2 = 0.566997; F-statistics = 17.27461 and prob. (F-statistics = 0.000000), and Durbin-Watson stat = 1.981124
Notes 2: *** denotes significance level at 1%

The above table shows the regression result of banks profitability which is measured by ROE as dependent variable and the explanatory variables of bank specific, industry specific and macro-economic factors of determinants. The R2 value of 0.601836 indicates that the variables in this model are representing 60.18% which is a good result to show how much the explanatory variables have a power to represent the model.

The F-statistics tests of this regression model is17.27461which indicates that the null hypothesis that all of the slope parameters (βs‟) are jointly zero. In the above case p-value of zero attached

to the F- statistic shows that this null hypothesis should be rejected even at 1% level of significance.

From table 4.4 it can be seen that nonperforming loan, capital adequacy, loan to deposit and bank size are statistically significant factors at 1% and affecting the bank profitability.

The first two variables NPLR and CAR had coefficients of -3.236771 and -0.991556 respectively and affect profitability negatively, which means the one unit NPLR and CAR increased in the bank have a 3.23 and 0.99 unit change on banks profitability to the opposite direction. However, LTD and Bank size had a positive impact on ROE and having a coefficient of 0.252548 and 0.048750 respectively, which implies that one unit change in LTD and BS will have 0.25 and 0.05 change on profitability with the same direction respectively.

Table 4.4 shows in terms of significance level (corresponding p-value) the industry specific Interest Spread and from Macroeconomic factor GDP and Inflation had more than the selected significance levels (5%) 0.9435, 0.6323, and 0.7185respectively.

Thus, opposing to the researcher`s expectation; Interest Spread, GDP and Inflation did not show any significant impact on the level of ROE of commercial banks in Ethiopia from year 2003-2013.

4.5 Discussion of the Regression Results

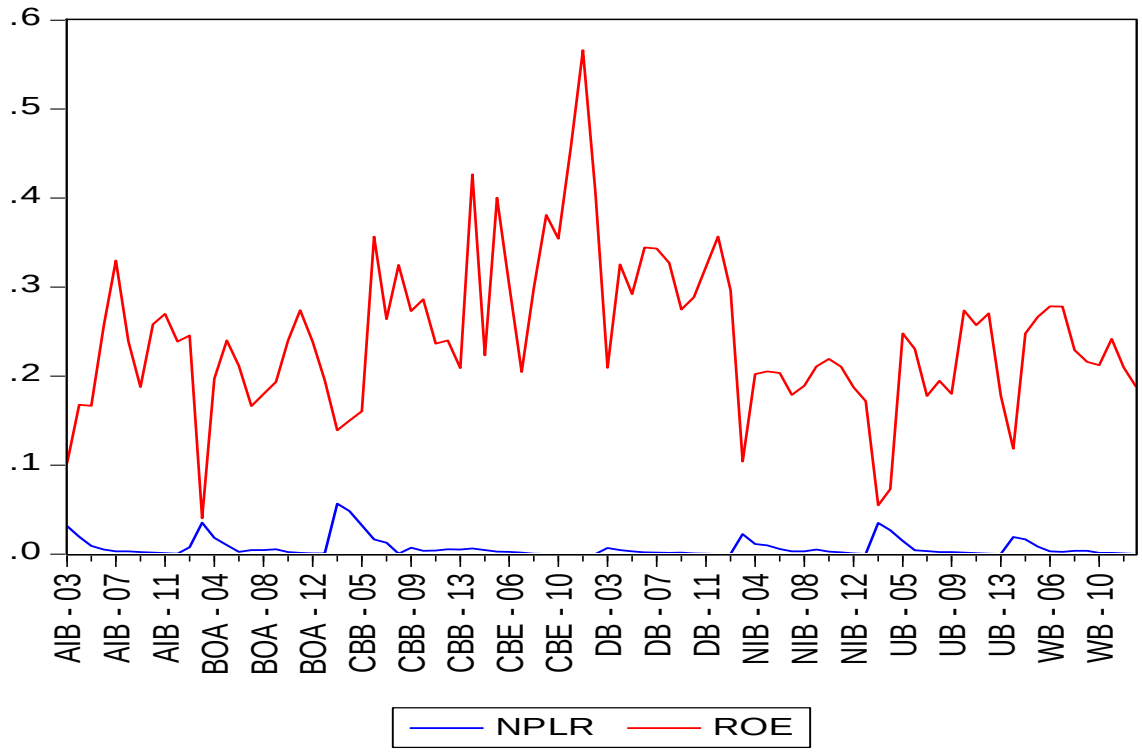
The main objective of this study was to examine the impact of credit risk management on profitability of commercial banks in Ethiopia. Based on previous studies and the finding of this study, this section discussed the general result obtained via Random Effect Regression Model as shown in the above table 4.4. Referring the literature, the result of each explanatory variable including their impact on the level of ROE of commercial banks in Ethiopia was discussed. The estimation results that presents the impact of explanatory variables on ROE were discussed as follows:

Nonperforming Loan Ratio (NPLR)

According to the result obtained in Table 4.4, one of the bank specific factor which is proxy of the credit risk NPLR has a significant impact on the performance of the bank (ROE). The probability of 0.0000 enables the researcher to reject the null hypothesis of no significant impact on profitability and accept the alternate. Non-performing loan Ratio shows the level of banks' exposure to credit risk.

This finding go in line with the literatures Tefera (2011) and Mekasha (2011) both concluded that there is a negative relationship between credit risk and performance of commercial banks in Ethiopia. The coefficient -3.236771implies that the one unit increased on NPLR has a 3.24 unit change on profitability but opposite direction. This finding is in line with also with the researcher expectation.

Fig 4.2 Moving Trend analysis of Nonperforming Loans with ROE



Source: The researcher EView regression result

The above trained analysis clearly shows that when ROE growth to upside the NPLR will go to downward and then vice versa. This has an implication of whenever there is small credit risk, there is a good performance of banks and at the same time whenever high credit risk, the bank performance gets poorest.

One of the possible explanation is banks in Ethiopia request a sufficient guarantee or collateral to give a loan. As a result the probability the borrowers encounter a default is much less. The NPLR trained also shows the NPL of banks is continually reducing from what it was before.

In addition to this proclamation no. 97/1998 a proclamation to provide for property mortgaged or pledged with by banks gave banks a right to sell properties which they hold as a collateral

and the borrower fails to pay the loan. This also additional tools for banks to minimize the risk and also to increase their profit accordingly.

Capital Adequacy Ratio (CAR)

Based on the findings in Table 4.4, the negative and statistically significant impact of capital adequacy on ROE determines the risk taking behavior of banks. This study identifies statistically significant and negative impact of capital adequacy ratio on ROE. Thus, result is inconsistent with the hypothesis developed in this study. The study hypothesized that there is a positive association between CAR and ROE of banks (Goddard et al., 2004).

This negative sign indicates an inverse relationship between capital adequacy ratio and ROE. Thus, it implies that for one unit change in the banks' capital adequacy ratio, keeping other thing constant had resulted 0.99unit changes on the levels of ROE in opposite direction. This means that when banks keep Birr 1 as a CAR, they will loss 0.99 Birr as a profit.

This result also in the contrary of what Berger, 1995; Bourke, 1989; Hassan and Bashir, 2003) had found as they have agreed on equity to total assets ratio is expected to have positive relation with performance that well-capitalized banks face lower costs of going bankrupt which reduces their costs of funding and risks.

Loan to Deposit (LTD)

The regression table 4.4 shows the result of LTD a probability of 0.00000 with the coefficient of 0.252548. It describes that this variable has a positive impact on profitability and the one Birr given as a loan from a deposit has the effect of Birr 0.25 on banks profitability in Ethiopia. This result is in line with Rengasamy, 2014 conclusion and also the coefficient sign is similar to the researcher expectation.

This is the result of the interest rate difference between what the banks charging on loan and what they actually paying on the deposits. Whenever this ratio increases more and more, the bank becomes more and more risky as the loan amount would be equal or sometimes greater than the deposit amount. As a result banks suffer with a liquidity problem and that may also makes the bank risky.

Bank Size (BS)

The last bank specific factor for this study BS results in the above table 4.4 shows that there is a positive and statistically significant impact of Bank Size on bank profitability. The result shows a positive coefficient of 0.048750and a p-value of 0.000. This indicates that the bank size is significant factor for bank performance even at 1% significance level. This implies that for one unit change in BS, keeping the other things constant had resulted 0.05 unit change on the level of ROE in the same direction. This result agrees with the finding of Akhavein et al. 1997; Bourke 1989; Molyneux and Thornton 1992; Bikker and Hu 2002; Goddard et al. 2004.

Interest Rate Spread (IS)

The regression table 4.4 also shows the result of probability 0.9435 which is above the significant value of 5%, as a result the null hypothesis did not be rejected. It implies that Interest spread has no significant impact on ROE. However, the coefficient -0.114296indicates that the one unit change in IS will have the effect of 0.11 unit change on the ROE to the opposite direction but insignificantly. Both the result as well as the coefficient is in contrast than what the researcher has expect. The possible reason for this may to happen the government close control on the minimum deposit rate and reserve requirement for deposits.

In addition, the other possible reason may banks income now made from non-interest income like commissions on money transfer, foreign exchange rate, Letter of guarantee, and various service charges.

Gross Domestic Product (GDP)

The result of the regression shows that GDP growth rate had statistically insignificant impact on ROE, the probability 0.6323do not help the researcher to reject the null hypothesis and to accept the alternate. However, the coefficient sign for real GDP growth rate was positive similar to the researcher expectation0.088086. This indicate that the change in GDP to the bank profitability is positive but insignificantly.

This finding is very opposite to Carling, Jacobson, Linde and Roszbach (2007), Bonfim (2009), IMF (2000), Jimenez and Saurina (2006) as they report that, macroeconomic variables should be included into credit risk analysis since they have considerable influence on the changes of credit risk at the aggregated level.

Inflation (INF)

The other macroeconomic factor inflation had statistically insignificant impact on financial performance. The coefficient -0.023662 shows that the inflation affect the bank performance negatively like the researcher expectation but not significantly. As the probability of the regression result for this variable is 0.7185, the researcher is not on the position which enables to reject the null hypothesis.

CHAPTER FIVE

5 CONCLUSION AND RECOMMENDATION

So far the previous chapter presented descriptive analysis and examined the result of the regression of all independent variables against the theories and the researcher expectations. Besides, the results of findings and discussion were also made with the trained analysis of ROE with the credit risk management proxy of NPLR.

5.1 Conclusion

The main objective of this study was to examine the impact of credit risk management on commercial banks profitability in Ethiopia based on panel data analysis for the period 2003 to 2013. The data was analyzed by using random effect model and used for the purpose of analysis, EView 6 software.

The study concluded that NPLR, Capital Adequacy, Loan to Deposit and Bank Size, had a statistically significant effect on the level of ROE. However, the results of this random effect regression model revealed the insignificant effect of Interest spread rate, GDP and inflation rate on the level of ROE of commercial banks in Ethiopia for the period under consideration.

According to the regression results, the findings indicated that bank credit risk management measured in terms of NPLR has negative and statistically significant impact on ROE. This result is unusual since one would expect a riskier business will have the bigger return. This implies that banks can make a profit as far as they can minimize the credit risk.

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

The positive statistically significant impact of Loan to Deposit on ROE shows that the bank charge more than what the bank incurring as interest expense for the depositors and the more loan the bank give will have a significant effect on banks profitability.

The last bank specific factor in this study which has a positive and statistically significant factor is a Bank Size. The bank which has big size will have the ability to absorb potential risks and

to avoid some expenses and as a result the bank can increase profitability when the bank size gets big than small banks.

In general, the researcher has concluded that bank specific factors have an impact on banks profitability and from these variables NPLR, CAD, LTD and Bank size have a significant impact on profitability, while other external factors both macroeconomic (GDP and INF) and industry specific factors (Interest Spread) have no significant impact in Ethiopia banks profitability. Thus it can be concluded that profitability in the Ethiopia banking sector is largely driven by managerial decision than external factors.

5.2 Recommendations

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

- ✓ The bank management need to be cautious in setting up a credit policy that will not negatively affects profitability and also they need to know how credit policy affects the operation of their banks to ensure judicious utilization of deposits and maximization of profit.
- ✓ Banks should establish credit policies and standards that conform to regulatory requirements and the bank's overall objectives to further reduce the level of their credit risk exposure.
- ✓ There is also need for banks to adopt sound corporate governance practices, manage their risks in an integrated approach, focus on core banking activities and adhere to prudential banking practices.
- ✓ By improving the bank size and loan to deposit ratio the bank should maximize the profit. But the bank size should be up to certain limit. Beyond this point the effect of size could be negative due to bureaucratic and other reasons. In addition the loan also should be given up to some stage where the liquidity risk do not exist.
- ✓ The bank should give more attention and utilization on the bank specific factors than both the industry and macroeconomic factors as those external factors on banks performance is not significant.
- ✓ The study suggests that a further study should be done on the impact of credit risk management on profitability of Ethiopian Banks by taking additional variables as credit risk management is highly determine how banks can be profitable with the risk amount they took to do the business.

References

Abdullahi Sani Rufai (2013), Efficiency of Credit Risk Management on the Performance of Banks in Nigeria A Study of Union Bank PLC (2006-2010).

AbedalfattahZuhair Al-Abedallat and 2faris Nasif Al- Shubiri (2013), Analysis the Determinants of Credit Risk In Jordanian Banking: An Empirical Study.

Aburime, U. (2005) Determinants of Bank Profitability: Company-Level Evidence from Nigeria. Nigeria: University of Nigeria, Enugu Campus.

Achou TF, Tenguh NC (2008).Bank performance and credit risk management.

Agu (1992), "Analysis of the Determinants of the Nigerian banking System's profits and profitability Performance" Saving and Development.

Ainembabazi Brenda (2013), Risk Management and Profitability of Financial Institutions: A case of Stanbic Bank, Katwe Branch.

Akhavein, J.; Berger, A. N.; Humphrey, D. B. 1997. The effects of megamergers on efficiency and prices: Evidence from a bank profit function, Review of Industrial Organization 12(1): 95–139.

Al-Gari, M .Ali (2001), Credit Risks in Islamic Banks‟ Finance, IRTI-HIBFS Seminar on Regulation and Supervision of Islamic Banks: Current Status and Prospective.

Al-Tamimi, H., Hassan, A. (2010) Factors Influencing Performance of the UAE Islamic and Conventional National Banks. Department of Accounting, Finance and Economics, College of Business Administration, University of Sharjah.

Angbanzo, L. (1997). Commercial Bank Net Interest Margins, Default risk, Interest rate risk, and Off-Balance sheet Banking. Journal of Banking and Finance, 21, 55-87.

Angeloni I, Faia E (2009). A tale of two policies prudential regulation and monetary policy with fragile banks. Kiel Institute for die World Economy. Kiel Working Papers 1569. Kiel.

Anna P. I. Vong et al 2009) , Determinants of Bank Profitability in Macao

Anna Pestova, Mikhail Mamonov (2013), Macroeconomic and bank-specific determinants of credit risk: evidence from Russia

Anthony M. Santomero, 1997), _Commercial bank risk management: an analysis of the processes‘, university of Pennsylvania, Warton.

AraHosna et-al (2009), Credit Risk Management and Profitability in Commercial Banks in Sweden.

Athanasoglou, P. P.; Brissimis, S. N.; Delis, M. D. 2007. Bank specifi c, industry specifi c and macroeconomic determinants of bank profitability, Journal of International Financial Markets, Institutions and Money 18(2): 121–136.

Available at: http://data.worldbank.org/indicator/FB.BNK.CAPA.ZS [Accessed: 25

Awoyemi Samuel Olausi (2014), the Impact of Credit Risk Management on The Commercial Banks Performance In Nigeria.

AyalewEshetie (2011): The Application of Management Control System in Ethiopian Commercial Bank. Addis Ababa, Published Thesis (MSc), Addis Ababa University

Babbie, E. (2004). The practice of social research. 10th edition. Belmont: Thomson

Banks: a cross-sectional and dynamic panel analysis. The Manchester School, 72 (3),

Basel: Basel Committee on Banking Supervision. (2005), Core Principles for EffectiveBanking Supervision.

Ben Naceur, S., K and Il, M. (2009). The impact of capital requirements on banks' cost of intermediation and performance: The case of Egypt. Journal of Economics and Business, 61 (1), pp. 70--89

Berger, A. N. (1995). The Relationship between Capital and Earnings in Banking. Journal of Money, Credit and Banking, 27(2), 432-456.

Berger, A. N. and Humphrey, D. B. (1997) Efficiency of Financial institutions: international survey and directions for future research, European Journal of Operational Research, 98 (2), 175-212.

Berger, A. N.; Hanweck, G. A.; Humphrey, D. B. 1987. Competitive viability in banking: Scale scope and product mix economies, Journal of Monetary Economics 20(3): 501–520.

Bikker, J.; Hu, H. 2002. Cyclical patterns in profits, provisioning and lending of banks and procyclicality of the New Basel Capital Requirements, BNL Quarterly Review 221: 143–175.

Bonfim D.(2009). Credit risk drivers: Evaluating the contribution of firm level information and of macroeconomic dynamics. Journal of Banking & Finance, (2009), 33: 281-299.

BoudrigaAbdelkader ,Boulila T. Neila and JellouliSana (2009): Bank Specific, Business and Institutional, Environment Determinants of Nonperforming Loans: Evidence from MENA Countries, Journal of Financial Economic Policy, Vol. 1 No. 4, Pp. 286-318

Boudriga, A., Taktak, N. B. and Jellouli, S. (2009). Banking supervision and nonperforming loans: a cross-country analysis. Journal of financial economic policy,

Boundless. "Calculating Real GDP." Boundless Economics. Boundless, 27 Jun. 2014. Retrieved 25Apr.2015from https://www.boundless.com/economics/textbooks/boundless-economics-textbook /measuring-output-and-income-19/comparing-real-and-nominal-gdp-94/calculating-real-gdp-357-12454/

Bourke, P. 1989. Concentration and other determinants of bank profitability in Europe, North America and Australia, Journal of Banking and Finance 13(1): 65–79.

Boyd, J. and Runkle, D. 1993. Size and performance of banking fi rms: Testing the predictions theory, Journal of Monetary Economics 31(1): 47–67.

Brewer III, E. and Jackson III, W. E. (2006). A note on the "risk-adjusted" price--concentration relationship in banking. Journal of Banking & Finance, 30 (3), pp. 1041--1054

Brooks, C 2008, Introductory Econometrics of Finance, 2nd ed., the ICMA Center, University of Reading, CAMBRIDGE University press.

Buch CM, Eickmeier S, Prieto E (2010). Macroeconomic factors and micro-level bank risk. Deutsche Bundesbank Discussion Paper Series 1. Economic Studies20.

Business Dictionary (2013). Nominal GDP. Retieved on October 25, 2013 from www.businessdictionary.com

Carling K., Jacobson T., Linde J. and Roszbach K.(2007). Corporate Credit Risk Modeling and the Macroeconomy. Journal of Banking & Finance, (2007), 31: 845-868.

Cebenoyan AS, Cooperman ES, Register CA (1999). Ownership structure charter value and risk-taking behavior of thrifts Financial Management, 28 (1): 43-60.

Central Bank of Nigeria Annual Report & Accounts, 2007.

Chantapong, S. (2005) Comparative Study of Domestic and Foreign Bank Performance in Thailand: The Regression Analysis. The Office of Macroeconomic Policy and Analysis, Monetary Policy Group (MPG), the Central Bank of Thailand, Bangkhunprom, 2005.

Charles,Tapiero (2004). Risk and Financial Management: Mathematical and Computational Methods. John Wiley & Son. ISBN 0-470-84908-8.

Chirwa (2001), "Market Structure, Liberalization and performance in the Malawian Banking Industry", AERC, RP 108.

Chodechai (2004) investigates factors that affect interest rates, degree of ... since they are likely to take on highly risky projects or investments.

Christophe J. Godlewski &Ydriss Ziane, (2008), "How many banks does it take to lend?Empirical evidence from Europe," Working Papers of LaRGE Research.

Civelec and Al-Alami (1991), "An Empirical Investigation on the Concentration-profitability Relationship in the Jordanian Banking System", saving and Development.

Crouhy, Micheal, Dan Galai, and Robert Mark (2001), Risk Management, McGraw Hill.

Daferighe, E. E &Aje, S. O. (2009). An impact analysis of real gross domestic product, inflation and interest rates on stock prices of quoted companies in Nigeria. International Research Journal of Finance and Economics, 25, 53-60.

Dang, Uyen. (2011) the CAMEL Rating System in Banking Supervision: a Case Study of

Arcada University of Applied Sciences, International Business.

Danson Musyoki (2011), the impact of credit risk management on the financial performance of Banks in Kenya for the period 2000-2006.

Das,Satyajit (Editor) (2000), Credit Derivatives and Credit Linked Notes, 2nd Edition, Development held in Khartoum April 2001.

DeYoung R. And Whalen G. (1994): "Banking Industry Consolidation: Efficiency Issues", Working Paper No. 110 A Conference of the Jerome Levy Economics Institute, Office of the Comptroller of the Currency, Washington, DC.

DhanuskodiRengasamy (2014), Impact of Loan Deposit Ratio (LDR) on Profitability: Panel Evidence from Commercial Banks in Malaysia

DhuhaMuslehFadhel Conditions and Soundness of UAE Banking Sector

Dorfman, Mark S. (2007. Introduction to Risk Management and Insurance (9thed). Englewood Cliffs, N.J: Prentice Hall. ISBN 0-13-224227-3.

Edition, published by jone Wiley and sons

Edwards, P Bowen, P (2005) Risk Management in Projects UNSW Press, for the year ended31 December 2010 (Report by Phillip Odera, the managing director, 2010).

Eichengreen, B.; Gibson, H. D. 2001. Greek Banking at the Dawn of the New Millennium. CEPR Discussion Paper.

Elena Carletti (2006), Credit risk transfer and Contagion University of Pennsylvania, USA

Ewert and Schenk (1998), Small and medium enterprises: Strategies for promotion and challenges of their development in Nigeria.

Galorath, D. (2006). Risk Management Success Factors, PM World Today, Vol 8(11), from http://www.pmforum.org

Gerhard.S. 2002, _Risk management and value creation in financial institution', illustrated

Ghauri, P. N. and Grønhaug, K. (2005). Research methods in business studies. 2nd.

Gilbert (1984) "Bank Market Structure and Competition", Journal of Money, credit and banking, Vol. 16, No. 4.

Gizycki M (2001); "The Effect of Macroeconomic Conditions on Banks‟ Risk and profitability".

Goddard, J., Molyneux, P. and Wilson, J. O. (2004). The profitability of european

Grabowski, M. And Roberts, K. (1999), Risk mitigation in virtual organizations

Organisational Science. Vol. 10(6), pp. 704-722.

Gujarati, D.N. and Sangeetha.S.(2007). Basic Econometric, 4th Edition.McGraw-Hill Education Books Ltd.India.

Gujarati, D.N. and Sangeetha.S.(2008). Basic Econometric, 4th Edition.McGraw-Hill Education Books Ltd.India.

Habtamu Negussie (2012): Determinants of Bank Profitability: An Empirical Study on Ethiopian Private Commercial Banks: Published thesis (MSC), Addis Ababa University

HamisMugendawala (2010), A research Report submitted to the School of Graduate Studies in Partial Fulfillment of the Requirements for the Award of Master of Science (Accounting and Finance) Degree of Makerere University.

Hamisu Suleiman Science Vol. 3 No 7; Kargi (2011). Credit risk and the performance of Nigerian banks. Department of accounting Faculty of Administration Ahmadu Bello University, Zaria – Nigeria

HaneefShahbaz , RiaszTabassum, Razman Muhammad, R.AliMansoor A. R., I. Muhammed - Hafiz and Karim Yasir (2012): Impact of Risk Management on Nonperforming Loans and Profitability of Banking Sector of Pakistan; International Journal Of Business And Social

Harlow, England: Financial Times Prentice Hall.

Harrison Owusu AFRIYIE (2013), Credit Risk Management and Profitability of Selected Rural Banks In Ghana.

Hasanali, F. (2002), "Critical success factors of knowledge management." Retrieved 2. March 2012, from www.kmadvantage.com/docs/km-articles/Critical-Success-Factors-of- KM.pdf.

Heffernan, S., (1996), Modern banking in theory and practice, John Wiley and Sons, Chichester

Helgesen, Q (1999) Customer Accounting and Customer Profitability Analysis. Some Theoretical Aspects and some Empirical Evidence, SNF Working Paper, No.67.

Henriksen, P. and Uhlenfeldt, T. (2006), Contemporary Enterprise-Wide Risk Management http://www.btquarterly.com/?mc=bet-governance&page=ss-viewresearch.

Ho, T. S. Y., &Sauders, A. (1981). The determinants of bank interest margins: Theory and Empirical evidence. Journal of Financial and Quantitative Analysis, 16, 581-600.

Hosna A, Manzura B, Juanjuan S (2009). "Credit risk management and profitability in commercial banks in Sweden" School of Business Economics and Law.

Hubbard, Douglas (2009). The Failure of Risk Management: Why it‟s Broken and How to Fix It. John Wiley & Sons.

Ifinedo, P. (2008), "Impacts of business vision, top management support, and external expertise on ERP success", Business Process Management Journal, Vol 14(4), pp.551-568.

International Monetary Fund (2000). Macro-prudential Indicators of Financial System Soundness. Occasional Paper, (April 2000): 192.

Jimenez G. and Saurina J. June (2006). Credit cycles, credit risk and prudential regulation. International Journal of Central Banking, 2, 2 (2006): 65-98.

Josef F. Hair, Celsi M.W., Arthur H. M., Samouel P. and Page M.J. (2011). Essentials of Business Research Methods. 2nd edition. M.E. Sharpe

Joseph E. Stiglitz, AndrewWeiss (1981). The American Economic Review, Volume "i1, Issue 3 (Jun, 1981),

Journal of Cost Management (September/October): 5-15.

Kaplan, R.S. and V.G. Narayanan (2001), "Measuring and Managing Customer Profitability".

Karceski (2004), Handbook of Corporate Finance: Empirical Corporate Finance

KOLAPO, T. Funso et-al (2012), Credit Risk and Commercial Banks' Performance in Nigeria: A Panel Model Approach.

Kosmas Njanike(2009), the Impact of Effective Credit Risk Management on Bank Survival.

Lafunte Esteban (2012): Monitoring Bank Performance in the Presence of Risk Mirceaepure: Working Papers Barcelona, Spain

Lam, James (2003). Enterprise Risk Management: From Incentives to Controls. John Wiley.

Maki, Vasiliki, TsagkanofAthanaios and Bellas Athanasios (2014): Determinants of Nonperforming Loans: The case of EuroconePanoeconmicus, Volume2, and pp 153-206Mar 2014].

Maudos, J., & Guevara, J. (2004). Factors explaining the interest margin in the banking sectors of the European Union. Journal of Banking and finance, 28(9), 2259-2281.

Megginson WL (2005). The economics of bank privatization. J. Banking. Fin., 29: 1931-1980.

Mekasha G (2011) "Credit Risk Management and Its Impact on Performance on Ethiopian commercial Banks" unpublished thesis (Msc), Addis Abeba University

Melkamu G (2012). Factors Contributing for Non-Performing Loans in Ethiopian Commercial Banks (unpublished), Thesis Submitted for partial Fulfillment of MSc Degree in Accounting and finance to Department of Accounting and Finance, College of Business and Economics, Jimma University, Ethiopia

Miller, S. M.; Noulas, A. 1997. Portfolio mix and large bank profitability in the USA, Applied

Economics 29(4): 505–512

Million Gizaw1* ,Matewos Kebede1 and Sujata Selvaraj2 (2015), The impact of credit risk on profitability performance of commercial banks in Ethiopia

Molyneux, P. and Forbes, W. (1995) Market structure and performance in European Banking, Applied Economics, 27.

Molyneux, P. and Thornton, J. 1992. Determinants of European Bank Profitability: A Note, Journal of Banking and Finance 16(6): 1173–1178.

Mottef, John (2005): Risk Management and Critical Infrastructure Protection; Assessing, intergrading and Managing Threats, Vulnerabilities and Consequences (report). Washington DC; Congressional research service.

Musyoki D, Kadubo AS (2011). The Impact of Credit Risk Management on the Financial Performance of Banks in Kenya for the Period 2000–2006 Int. J. Bus. Public Manage. 2(2):72-80.

NBE (2008): Asset Classification and Provisioning Directive No. SBB/43/2008. National Bank of Ethiopia, Addis Ababa

NBE (2011), Revised Banking Credit Risk Management Guide Line in Ethiopia.

NevineSobhy Abdel Megeid (2013), The Impact Of Effective Credit Risk Management On Commercial Banks Liquidity Performance: Case Of Egypt.

NorainiMohdAriffin Salina Hj. Kassim(2013), Risk Management Practices and Financial Performance of Islamic Banks: Malaysian Evidence.

OGBOI, Charles (2013), Impact of Credit Risk Management and Capital Adequacy on the Financial Performance of Commercial Banks in Nigeria.

Ogilo Fredrick, PhD (2012), The Impact of Credit Risk Management on Financial Performance of Commercial Banks in Kenya.

Olga Bohachova (2008). The impact of macroeconomic factors on risks in the banking Sector: A cross-Country empirical assessment. Paper provided by InstitutfürAngewandteWirtschaftsforschung (IAW) in its series IAW Discussion Papers with no. 44.

Olivier Blanchard, (2000), The Economics of Unemployment. Shocks, Institutions, and Interactions.

Olweny, T., Shipho, T.M. (2011) Effects of Banking Sectoral Factors on the Profitability of Commercial Banks in Kenya. Economics and Finance Review, 1(5), 1-30.

Onaolapo A. R. (2012), Analysis Of Credit Risk Management Efficiency In Nigeria Commercial Banking Sector, (2004-2009).

Ongore, V.O. (2011) The relationship between ownership structure and firm performance: An empirical analysis of listed companies in Kenya. African Journal of Business Management, 5(6), 2120-2128.

Patnaik and Vasudevan, 1998, Effect Of Bank Lending Rate On The Performance Of Nigerian Deposit Money Banks, Department Of Banking And Finance, School Of Management Sciences, Federal Polytechnic Oko, Anambra State-Nigeria.

Payle D (1997), "Bank Risk Management", Working Paper NO.272, University of RBA.

Poudel RPS (2012). "The impact of credit risk management in financial performance of commercial banks in Nepal". International Journal of arts and commerce. pp. 363--381.

Ravi Prakash Sharma Poudel (2013), Macroeconomic Determinants of Credit Risk in Nepalese Banking Industry

Remi, A. (2002): Advance Financial Accounting, second edition.

Research Discussion Paper, Reserve Bank of Australia.

Richard Loth (2015), Profitability Indicator Ratios: Return On Assets

Rime, B. (2001). Capital requirements and bank behaviour: Empirical evidence for Switzerland.Journal of Banking & Finance, 25(4), pp.789--805.

Rosemary Peavler , (2001), What is the operating profit margin ratio.

Samuel Hymore Boahene1* Dr. Julius Dasah2, Samuel Kwaku Agyei3 (2012), Credit Risk and Profitability of Selected Banks in Ghana.

Saunders A, Strock E, Travlos NG (1990). Ownership structure, deregulation, and bank risk taking. J. Fin., 45(2): 643-654.

ShahbazHaneef et-al (2012), Impact of Risk Management on Non-Performing Loans and Profitability of Banking Sector of Pakistan.

Smirlock (1985), "Evidence on the (non) Relationship between Concentration and Profitability in Banking", Journal of Money, Credit, and Banking, Vol.17No 1

TaiwoAdewaleMuritala*1, Abayomi Samuel Taiwo2,(2013), Credit Management Spur Higher Profitability? Evidence from Nigerian Banking Sector.

Tefera T (2011), Credit risk management and profitability of commercial bank in Ethiopia. Unpublished thesis (Msc), Addis Abeba University.

The World Bank. (). Bank capital to assets ratio (%) | Data | Table. [online]

Tibebu Tefera (2011), Credit Risk Management AndProfitablity Of Commercial Banks In Ethiopia.

TigranPoghosyan (2012), 2014IMF Working Paper WP/12/140

TomakSerpil(2013) Determinants of Commercial Banks 'lending Behavior: Evidence From Turkey: Journal Of Empirical Research, 3(8):933-943.

TseganeshTesyaye (2012) Determinants of Banks Liquidity and Their Impact on Financial Performance: Published thesis (MSc), University Addis Ababa, Ethiopia

Ugbede, O., Otache, I., & Umar, K. (2012). Analysis of the impact of commercial banks credit on the Nation's gross domestic product. International Journal of Accounting and Management Studies, 4(1), 62-69.

Vítor Castro (2013), Macroeconomic Determinants of the Credit Risk in the Banking System:The Case of the GIPSI University of Coimbra, GEMF and NIPE

Wadsworth.Young, R. and Jordan, E. (2008), Top management support: Mantra or necessity, International Journal of Project Management, vol 26 (7), pp.713-725 Management.

Zerayehu Sime Eshete, 2Kagnew WoldeTesome, 3 Teshome Ketama Abebe (2013), Competition in Ethiopian Banking Industry.

Zwikael , O. (2008),Top management involvement in project management across country study of the software industry, international Journal of Managing Projects in Business, vol 1(4), pp.49.

APPENDICES

APPENDIX-1Hetroskdasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.448729	Prob. F(7,80)	0.1978
Obs*R-squared	9.900226	Prob. Chi-Square(7)	0.1943
Scaled explained SS	9.169166	Prob. Chi-Square(7)	0.2407

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/25/15 Time: 03:51
Sample: 1 88
Included observations: 88

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002131	0.014771	-0.144247	0.8857
NPLR	-0.012815	0.044915	-0.285324	0.7761
CAR	-0.015905	0.010358	-1.535498	0.1286
LTDR	3.69E-05	0.002567	0.014367	0.9886
BSLN	0.000430	0.000483	0.889890	0.3762
IS	-0.036315	0.078398	-0.463214	0.6445
GDP	-0.009803	0.009348	-1.048699	0.2975
INF	-0.001345	0.003199	-0.420446	0.6753

R-squared	0.112503	Mean dependent var	0.001940
Adjusted R-squared	0.034847	S.D. dependent var	0.002922
S.E. of regression	0.002870	Akaike info criterion	-8.782298
Sum squared resid	0.000659	Schwarz criterion	-8.557085
Log likelihood	394.4211	Hannan-Quinn criter.	-8.691565
F-statistic	1.448729	Durbin-Watson stat	1.712979
Prob(F-statistic)	0.197784		

APPENDIX-2 Autocorrelation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.420237	Prob. F(2,78)	0.6584
Obs*R-squared	0.938118	Prob. Chi-Square(2)	0.6256

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/25/15 Time: 04:00
Sample: 1 88
Included observations: 88
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001294	0.241913	0.005350	0.9957
NPLR	-0.031784	0.757827	-0.041941	0.9667
CAR	-0.013309	0.169266	-0.078631	0.9375

LTDR	-0.000155	0.041715	-0.003727	0.9970
BSLN	-0.000642	0.007871	-0.081534	0.9352
IS	0.247092	1.351527	0.182824	0.8554
GDP	-0.030219	0.160835	-0.187885	0.8515
INF	0.003820	0.052665	0.072542	0.9424
RESID(-1)	0.110214	0.122763	0.897778	0.3721
RESID(-2)	-0.027914	0.124673	-0.223898	0.8234

R-squared	0.010660	Mean dependent var	-1.73E-16
Adjusted R-squared	-0.103494	S.D. dependent var	0.044303
S.E. of regression	0.046539	Akaike info criterion	-3.190418
Sum squared resid	0.168937	Schwarz criterion	-2.908902
Log likelihood	150.3784	Hannan-Quinn criter.	-3.077002
F-statistic	0.093386	Durbin-Watson stat	2.004497
Prob(F-statistic)	0.999679		

APPENDIX-3 Hausman Test

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

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.054800	2	0.1317
Period random	5.453228	2	0.0654
Cross-section and period random	9.616965	2	0.0082

** WARNING: estimated period random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NPLR	-4.062864	-4.282333	0.017883	0.1008
CAR	-0.800895	-1.146846	0.030655	0.0482

Cross-section random effects test equation:
Dependent Variable: ROE
Method: Panel EGLS (Period random effects)
Date: 05/25/15 Time: 05:32
Sample: 2003 2013
Periods included: 11
Cross-sections included: 8
Total panel (balanced) observations: 88
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.361940	0.032497	11.13758	0.0000
NPLR	-4.062864	0.571454	-7.109694	0.0000
CAR	-0.800895	0.275204	-2.910181	0.0047

Effects Specification	S.D.	Rho

Cross-section fixed (dummy variables)

Period random	0.000000	0.0000
Idiosyncratic random	0.050714	1.0000

Weighted Statistics

R-squared	0.679375	Mean dependent var	0.243041
Adjusted R-squared	0.642380	S.D. dependent var	0.085720
S.E. of regression	0.051262	Sum squared resid	0.204965
F-statistic	18.36385	Durbin-Watson stat	1.681945
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.679375	Mean dependent var	0.243041
Sum squared resid	0.204965	Durbin-Watson stat	1.681945

Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NPLR	-2.746304	-4.282333	0.521920	0.0335
CAR	-1.220792	-1.146846	0.004611	0.2761

Period random effects test equation:
Dependent Variable: ROE
Method: Panel EGLS (Cross-section random effects)
Date: 05/25/15 Time: 05:32
Sample: 2003 2013
Periods included: 11
Cross-sections included: 8
Total panel (balanced) observations: 88
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.399950	0.025756	15.52838	0.0000
NPLR	-2.746304	0.911370	-3.013379	0.0035
CAR	-1.220792	0.222920	-5.476365	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	0.021731	0.1551
Period fixed (dummy variables)		
Idiosyncratic random	0.050714	0.8449

Weighted Statistics

R-squared	0.546405	Mean dependent var	0.243041
Adjusted R-squared	0.473830	S.D. dependent var	0.071099
S.E. of regression	0.051574	Sum squared resid	0.199488
F-statistic	7.528806	Durbin-Watson stat	1.589143
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.624136	Mean dependent var	0.243041
Sum squared resid	0.240277	Durbin-Watson stat	1.319370

Cross-section and period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NPLR	-2.281929	-4.282333	0.728256	0.0191
CAR	-0.863495	-1.146846	0.050111	0.2056

Cross-section and period random effects test equation:
Dependent Variable: ROE
Method: Panel Least Squares
Date: 05/25/15 Time: 05:32
Sample: 2003 2013
Periods included: 11
Cross-sections included: 8
Total panel (balanced) observations: 88

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.356422	0.034999	10.18388	0.0000
NPLR	-2.281929	1.018299	-2.240924	0.0283
CAR	-0.863495	0.308534	-2.798699	0.0067

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.726423	Mean dependent var	0.243041
Adjusted R-squared	0.649982	S.D. dependent var	0.085720
S.E. of regression	0.050714	Akaike info criterion	-2.928519
Sum squared resid	0.174889	Schwarz criterion	-2.365488
Log likelihood	148.8548	Hannan-Quinn criter.	-2.701688
F-statistic	9.503088	Durbin-Watson stat	1.805166
Prob(F-statistic)	0.000000		

APPENDIX-4Regression Result

Dependent Variable: ROE
Method: Panel EGLS (Two-way random effects)
Date: 05/25/15 Time: 22:47
Sample: 2003 2013
Periods included: 11
Cross-sections included: 8
Total panel (balanced) observations: 88
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.885312	0.284457	-3.112289	0.0026
NPLR	-3.236771	0.734788	-4.405038	0.0000
CAR	-0.991556	0.200244	-4.951742	0.0000
LTDR	0.252548	0.043306	5.831731	0.0000
BSLN	0.048750	0.009549	5.105469	0.0000
IS	-0.114296	1.607585	-0.071098	0.9435
GDP	0.088086	0.183409	0.480270	0.6323
INF	-0.023662	0.065419	-0.361701	0.7185

Effects Specification			
		S.D.	Rho
Cross-section random		0.023649	0.2329
Period random		0.014380	0.0861
Idiosyncratic random		0.040445	0.6811
Weighted Statistics			
R-squared	0.601836	Mean dependent var	0.101160
Adjusted R-squared	0.566997	S.D. dependent var	0.062436
S.E. of regression	0.041085	Sum squared resid	0.135038
F-statistic	17.27461	Durbin-Watson stat	1.981124
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.729205	Mean dependent var	0.243041
Sum squared resid	0.173110	Durbin-Watson stat	1.698620

APPENDIX-5Raw Data

Banks	Years	ROE	NPLR	CAR	LTDR	BS	IS	GDP	INF	BS(LN)	BS(Bill)
CBE	2003	0.427	0.006	0.053	0.433	24.200	0.071	-0.021	0.109	23.910	24,200,000,000.00
CBE	2004	0.223	0.005	0.053	0.369	27.975	0.071	0.117	0.073	24.055	27,975,000,000.00
CBE	2005	0.400	0.003	0.043	0.377	33.169	0.070	0.126	0.061	24.225	33,169,000,000.00
CBE	2006	0.303	0.002	0.042	0.329	35.849	0.070	0.115	0.106	24.303	35,849,000,000.00
CBE	2007	0.205	0.001	0.097	0.297	43.456	0.069	0.118	0.158	24.495	43,456,000,000.00
CBE	2008	0.298	0.000	0.090	0.461	50.416	0.074	0.112	0.253	24.644	50,416,108,000.00
CBE	2009	0.381	0.000	0.085	0.481	59.411	0.074	0.100	0.364	24.808	59,411,451,000.00
CBE	2010	0.354	0.000	0.075	0.439	74.187	0.076	0.106	0.028	25.030	74,186,907,000.00
CBE	2011	0.457	0.000	0.055	0.424	114.265	0.065	0.114	0.181	25.462	114,264,930,000.00
CBE	2012	0.566	0.000	0.049	0.534	158.814	0.063	0.087	0.341	25.791	158,814,428,984.00
CBE	2013	0.406	0.000	0.046	0.469	197.104	0.063	0.098	0.135	26.007	197,104,242,718.00
CBB	2003	0.139	0.057	0.084	1.150	0.942	0.071	-0.021	0.109	20.664	942,000,000.00
CBB	2004	0.150	0.048	0.079	1.072	1.057	0.071	0.117	0.073	20.779	1,057,000,000.00
CBB	2005	0.160	0.032	0.058	0.812	1.832	0.070	0.126	0.061	21.329	1,832,000,000.00
CBB	2006	0.357	0.016	0.087	1.212	1.797	0.070	0.115	0.106	21.309	1,797,000,000.00
CBB	2007	0.264	0.013	0.112	1.170	1.889	0.069	0.118	0.158	21.359	1,889,000,000.00

CBB	2008	0.325	0.000	0.108	0.931	2.392	0.074	0.112	0.253	21.595	2,392,017,000.00
CBB	2009	0.273	0.007	0.104	0.858	2.592	0.074	0.100	0.364	21.676	2,592,147,000.00
CBB	2010	0.286	0.004	0.101	0.743	3.162	0.076	0.106	0.028	21.874	3,161,663,000.00
CBB	2011	0.236	0.004	0.104	0.689	3.505	0.065	0.114	0.181	21.977	3,504,868,000.00
CBB	2012	0.240	0.005	0.081	0.513	5.947	0.063	0.087	0.341	22.506	5,946,604,000.00
CBB	2013	0.209	0.005	0.099	0.479	6.699	0.063	0.098	0.135	22.625	6,699,496,000.00
DB	2003	0.209	0.007	0.065	0.782	1.991	0.071	-0.021	0.109	21.412	1,991,000,000.00
DB	2004	0.326	0.004	0.064	0.776	2.677	0.071	0.117	0.073	21.708	2,677,000,000.00
DB	2005	0.292	0.003	0.071	0.788	3.420	0.070	0.126	0.061	21.953	3,420,000,000.00
DB	2006	0.345	0.002	0.085	0.857	4.546	0.070	0.115	0.106	22.238	4,546,000,000.00
DB	2007	0.343	0.001	0.090	0.820	6.041	0.069	0.118	0.158	22.522	6,041,000,000.00
DB	2008	0.327	0.001	0.093	0.712	7.829	0.074	0.112	0.253	22.781	7,828,587,000.00
DB	2009	0.275	0.002	0.093	0.562	9.733	0.074	0.100	0.364	22.999	9,732,578,000.00
DB	2010	0.288	0.001	0.091	0.498	12.353	0.076	0.106	0.028	23.237	12,353,381,000.00
DB	2011	0.323	0.001	0.095	0.525	14.660	0.065	0.114	0.181	23.408	14,659,792,000.00
DB	2012	0.357	0.000	0.104	0.578	17.520	0.063	0.087	0.341	23.587	17,520,038,000.00
DB	2013	0.297	0.000	0.104	0.559	19.747	0.063	0.098	0.135	23.706	19,747,171,000.00
AIB	2003	0.102	0.031	0.098	0.687	1.401	0.071	-0.021	0.109	21.060	1,401,000,000.00
AIB	2004	0.168	0.019	0.088	0.634	1.770	0.071	0.117	0.073	21.294	1,770,000,000.00
AIB	2005	0.167	0.009	0.102	0.665	2.226	0.070	0.126	0.061	21.523	2,226,000,000.00
AIB	2006	0.257	0.005	0.103	0.729	2.954	0.070	0.115	0.106	21.806	2,954,000,000.00
AIB	2007	0.330	0.003	0.113	0.807	3.830	0.069	0.118	0.158	22.066	3,830,000,000.00
AIB	2008	0.239	0.003	0.124	0.708	4.820	0.074	0.112	0.253	22.296	4,820,224,000.00
AIB	2009	0.188	0.002	0.119	0.547	6.423	0.074	0.100	0.364	22.583	6,422,547,000.00
AIB	2010	0.258	0.002	0.121	0.515	7.945	0.076	0.106	0.028	22.796	7,944,780,000.00
AIB	2011	0.270	0.001	0.132	0.515	10.116	0.065	0.114	0.181	23.037	10,115,780,000.00
AIB	2012	0.239	0.000	0.138	0.598	11.937	0.063	0.087	0.341	23.203	11,936,680,688.00
AIB	2013	0.246	0.008	0.139	0.615	14.859	0.063	0.098	0.135	23.422	14,858,821,000.00
BOA	2003	0.040	0.035	0.112	0.752	1.333	0.071	-0.021	0.109	21.011	1,333,000,000.00

BOA	2004	0.197	0.018	0.122	0.755	1.585	0.071	0.117	0.073	21.184	1,585,000,000.00
BOA	2005	0.240	0.010	0.123	0.758	2.057	0.070	0.126	0.061	21.445	2,057,000,000.00
BOA	2006	0.211	0.003	0.142	0.902	2.834	0.070	0.115	0.106	21.765	2,834,000,000.00
BOA	2007	0.166	0.005	0.119	0.847	3.396	0.069	0.118	0.158	21.946	3,396,000,000.00
BOA	2008	0.180	0.005	0.098	0.810	4.270	0.074	0.112	0.253	22.175	4,269,942,000.00
BOA	2009	0.193	0.005	0.095	0.603	5.477	0.074	0.100	0.364	22.424	5,476,617,000.00
BOA	2010	0.240	0.002	0.093	0.614	6.280	0.076	0.106	0.028	22.561	6,279,536,000.00
BOA	2011	0.274	0.001	0.091	0.546	7.278	0.065	0.114	0.181	22.708	7,277,959,000.00
BOA	2012	0.239	0.001	0.110	0.576	8.240	0.063	0.087	0.341	22.832	8,239,509,000.00
BOA	2013	0.195	0.001	0.109	0.553	10.129	0.063	0.098	0.135	23.039	10,129,369,000.00
WB	2003	0.118	0.019	0.105	0.811	0.889	0.071	-0.021	0.109	20.606	889,000,000.00
WB	2004	0.248	0.017	0.113	0.842	1.140	0.071	0.117	0.073	20.854	1,140,000,000.00
WB	2005	0.267	0.008	0.111	0.778	1.616	0.070	0.126	0.061	21.203	1,616,000,000.00
WB	2006	0.278	0.003	0.113	0.896	2.259	0.070	0.115	0.106	21.538	2,259,000,000.00
WB	2007	0.278	0.002	0.116	0.791	3.480	0.069	0.118	0.158	21.970	3,480,000,000.00
WB	2008	0.229	0.004	0.147	0.791	4.125	0.074	0.112	0.253	22.140	4,124,888,000.00
WB	2009	0.216	0.004	0.163	0.567	5.118	0.074	0.100	0.364	22.356	5,118,308,000.00
WB	2010	0.212	0.001	0.183	0.631	5.742	0.076	0.106	0.028	22.471	5,741,930,000.00
WB	2011	0.242	0.001	0.166	0.488	8.061	0.065	0.114	0.181	22.810	8,061,045,000.00
WB	2012	0.210	0.001	0.192	0.619	8.347	0.063	0.087	0.341	22.845	8,347,149,000.00
WB	2013	0.188	0.000	0.176	0.621	10.394	0.063	0.098	0.135	23.064	10,393,797,000.00
UB	2003	0.055	0.035	0.194	1.010	0.469	0.071	-0.021	0.109	19.966	469,000,000.00
UB	2004	0.073	0.027	0.142	0.722	0.674	0.071	0.117	0.073	20.329	674,000,000.00
UB	2005	0.248	0.015	0.116	0.686	1.073	0.070	0.126	0.061	20.794	1,073,000,000.00
UB	2006	0.230	0.004	0.119	0.823	1.599	0.070	0.115	0.106	21.193	1,599,000,000.00
UB	2007	0.178	0.003	0.165	0.915	2.183	0.069	0.118	0.158	21.504	2,182,500,000.00
UB	2008	0.195	0.002	0.144	0.761	3.250	0.074	0.112	0.253	21.902	3,249,957,000.00
UB	2009	0.180	0.002	0.112	0.595	4.652	0.074	0.100	0.364	22.260	4,651,697,000.00
UB	2010	0.274	0.001	0.108	0.553	5.896	0.076	0.106	0.028	22.498	5,896,229,000.00

UB	2011	0.257	0.001	0.117	0.540	7.726	0.065	0.114	0.181	22.768	7,725,615,000.00
UB	2012	0.270	0.001	0.125	0.605	8.787	0.063	0.087	0.341	22.897	8,786,856,000.00
UB	2013	0.178	0.000	0.120	0.584	9.978	0.063	0.098	0.135	23.024	9,977,669,000.00
NIB	2003	0.104	0.022	0.141	0.935	0.885	0.071	-0.021	0.109	20.601	885,000,000.00
NIB	2004	0.202	0.011	0.139	0.945	1.247	0.071	0.117	0.073	20.944	1,247,000,000.00
NIB	2005	0.205	0.010	0.129	0.926	1.732	0.070	0.126	0.061	21.273	1,732,000,000.00
NIB	2006	0.204	0.006	0.141	1.016	2.027	0.070	0.115	0.106	21.430	2,027,000,000.00
NIB	2007	0.179	0.003	0.163	0.967	2.607	0.069	0.118	0.158	21.681	2,607,000,000.00
NIB	2008	0.189	0.003	0.164	0.856	3.650	0.074	0.112	0.253	22.018	3,650,107,000.00
NIB	2009	0.211	0.005	0.152	0.674	4.807	0.074	0.100	0.364	22.293	4,806,504,800.00
NIB	2010	0.219	0.003	0.154	0.617	5.971	0.076	0.106	0.028	22.510	5,970,507,000.00
NIB	2011	0.211	0.002	0.165	0.536	7.112	0.065	0.114	0.181	22.685	7,111,522,000.00
NIB	2012	0.187	0.001	0.185	0.635	8.276	0.063	0.087	0.341	22.837	8,275,695,377.00
NIB	2013	0.172	0.000	0.182	0.683	9.145	0.063	0.098	0.135	22.936	9,144,540,286.00