

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

BY

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ID NO. MBAAF/0301/2005

DEPARTMENT OF ACCOUNTING & FINANCE

**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF
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St. Mary's university
School of Graduate Studies

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DECLARATION

I, the undersigned, that this thesis is my original work, prepared under the guidance of **Dr. Zenegnaw Abiy** All sources of materials used for this thesis have been dually acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institutions for the purpose of any degree.

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Endorsement

This thesis has been submitted to St. Mary's University, School of graduate studies for examination with my approval as a university advisor.

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Abstract

Since granting credit is one of the main sources of income in commercial banks, the management of the risk related to that credit affects the profitability of the banks. This study tries to find out how the credit risk management affects the profitability in the seven sample selected commercial banks using a balanced panel data from 2009-2013 and 35 observations have been used for the analysis. The main purpose of the study is to describe the impact level of credit risk management on profitability in the seven commercial banks in Ethiopia. The study only uses the quantitative approach and focuses on the description of the outputs from SPSS, used regression model to do the empirical analysis. In the model the researcher defined ROE as profitability indicator while Loan loss provision, liquidity, operating inefficiency, loan growth and capital adequacy ratio as credit risk management indicators. The regression results revealed that loan loss provision, operating inefficiency & loan growth have positive and statistically significant impact on banks profitability (Return on Equity). Finally, the results indicate that liquidity & capital adequacy have a negative but statistically significant relationship with banks Return on Equity.

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Chapter one: Introduction

Banks are relevant to economic development through the financial services they provide. Their intermediation role can be said to be a catalyst for economic growth. The efficient and effective performance of the banking industry over time is an index of financial stability in any nation. The extent to which a bank extends credit to the public for productive activities accelerates the pace of a nation's economic growth and its long-term sustainability.

The credit function of banks enhances the ability of investors to exploit desired profitable ventures. It's crystal clear that credit creation is the main income generating activity of banks. However, it exposes the banks to credit risk (Basel Accord, 2001)

As stated by Basel Accord (2001) Credit risk is the risk that a borrower or counterparty will fail to meet obligations in accordance with agreed terms of a contract.

Credit risk arises from the potential that the borrower or counterparty is either unwilling to perform on an obligation or its ability to perform such obligation is impaired resulting in accounting losses and economic exposures to the bank.

The Basel Committee on Banking Supervision (2001) defined credit risk as the possibility of losing the outstanding loan partially or totally, due to default risk. Credit risk is an internal determinant of bank performance. The higher the exposure of a bank to credit risk, the higher the tendency of the bank to experience financial crisis and vice-versa.

Among other risks faced by banks, credit risk plays an important role on banks' profitability since a large chunk of banks' revenue accrues from loans from which interest is derived. However, interest rate risk is directly linked to credit risk implying that high or increment in interest rate increases the chances of loan default.

Increasing amount of non-performing loans in the credit portfolio is unfavorable to banks in achieving their objectives. Non-performing loan is the percentage of loan values that are not serviced for three months and above. Due to increasing of non-performing loans (NPL) and its attendant consequences, the Central Bank authorities entered into agreement in December 1987 known as Basel I and II Accord which emphasized on credit risk management practices. Compliance with the Accord means a sound approach to tackling credit risk has been taken and this ultimately improves bank performance.

Banking industry in Ethiopia was dominated until very recently by the public owned commercial banks namely Commercial Bank of Ethiopia and Development Bank of Ethiopia. The sector was opened for private investors since the 90s. Since then some 18 private banks have been established and have been a significant engine for the growing economy. Commercial banks in Ethiopia extend credit (loan) to different types of borrower for many different purposes. For most customers, bank credit is the primary source of available debt financing and for banks good loans are the most profitable assets (Mishkin, 2004). Even if credit creation is the main income generating activity, it also involves huge risks to banks.

1.1 Statement of the Problem

Having an effective risk management is a crucial for banking business. Without a doubt, in present day's unpredictable and explosive atmosphere all banks are in front of enormous risks like credit risk, liquidity risk, operational risk, market risk, foreign exchange risk and interest rate risk, along with other risks, which may possibly affect the survival and successes of banks (Ali,Akhtar and Sadaqat,2011 and Al-Tamimi and Al-Mazrooei,2007).

In this regard, the national bank of Ethiopia conducted a survey on November 2009 aimed to identify status of risk management practice to address weaknesses. Questionnaires were distributed for a sample of 15 Ethiopian banks. The report revealed that credit and operational risks were key bank risks over the last two years and would continue to be so over the next five years. But, the study didn't disclose the impact level of credit risk on banks performance also the results and findings from some other countries studies produced mixed results thereby leaving the academia and policy makers in dilemma.

As stated by Zribi and Younes (2011), credit risk in emerging economy banks is higher than that in developed economies and that risk is formed by a larger number of bank-specific factors in emerging economies compared to their counterparts in developed economies.

Some studies on this topic show that credit risk management strategies impact on banks performance, but the impacts are of highly uncertain magnitude and conflicting direction. The implication that emerges from these studies is that the impacts of credit risk management on banks performance are theoretically ambiguous. For example, researchers like Kithinji, (2010), Epure and Lafuente (2012) amongst others found evidence that credit risk management does not impact positively on banks profitability.

In particular, while Kithinji (2010) found that other variables other than credit risk management impact on banks profitability, Epure and Lafuente (2012) found that banks performance improvement follow regulatory changes and not credit risk management.

1.2 Research Questions

Given the various issues relating to the impact of credit risk management on banks profitability in Ethiopia, a number of research questions are raised as follows:

- i. Does loan loss provisioning affect banks' profitability?
- ii. What relationship exists between liquidity ratio and banks performance?
- iii. What impacts dose bank's operating inefficiency have on profitability?
- iv. Does loan growth rate affect banks' profitability?
- v. To what extent does enhanced capital base contribute to banks profitability in Ethiopia?

1.3 Statement of Research Hypotheses

The following hypotheses are formulated in line with research questions and are therefore subjected to empirical investigation.

These hypotheses are stated in null context as follows:

H₀: There is no significant relationship between loan loss provision and bank's profitability.

H₀: Liquidity ratio has no significant impact on bank's profitability.

H₀: There is no significant relationship between operating inefficiency and bank's profitability

H₀: Loan growth rate has no significant impact on bank's profitability

H₀: Capital adequacy does not impact on bank's performance.

1.4 Objectives of the research

1.4.1 General objective of the research

The overall objective of this study is;

- ✓ To investigate the impact of credit risk management on commercial banks financial performance in Ethiopia.

1.4.2 Specific objectives of the research:

The specific objectives that the research intends to achieve are, to:

- i. Determine the extent to which loan provisioning affect banks profitability,
- ii. Establish the nature of relationship between liquidity ratio and banks performance,
- iii. Investigate the impact of operating inefficiency on banks profitability
- iv. Determine the extent to which loan growth affects banks' profitability, and

- v. Determine whether banks capital adequacy contributes to banks profitability in Ethiopia.

1.5 Delimitation (scope) of the research

The research is limited on identifying the relationship of credit risk management and profitability of commercial banks in Ethiopia. Thus, the other risks mentioned in Basel Accords are not discussed. Due to the unavailability of information in annual reports, the research sample only contains seven commercial banks and their 5 years' annual reports from 2009 to 2013 respectively.

The results of the study are limited to seven commercial banks in the sample and are not generalized for all commercial banks in Ethiopia. Finally, the researcher only uses the quantitative approach and focus on empirical analysis.

Chapter two: Review of related literature

2. Theoretical literature

2.1 Bank Risk

Risks are the uncertainties that can make the banks to loose and be bankrupt. According to the Basel Accords, risks the banks facing contain credit risk, market risk and operational risk. Credit risk is the risk of loss due to an obligator's non-payment of an obligation in terms of a loan or other lines of credit (Basel 2, 2006) The Basel committee proposes two methodologies for calculating the capital requirements for credit risk, one is to measure the credit risk in a standardized manner and the other is subject to the explicit approval of the bank's supervisor and allows banks to use the IRB approach. Market risk is defined as the risk of losses in on and off-balance sheet positions arising from movements in market prices (Basel 2, 2006). The capital treatment for market risk addresses the interest rate risk and equity risk pertaining to financial instruments, and the foreign exchange risk in the trading and banking books. The value at risk (VaR) approach is the most preferred to be used when the market risk is measured. Operational risk is defined as the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events. There are three approaches applied to the operational risk measurement: Basic Indicator Approach (BIA), Standardized Approach (SA), and Advanced Measurement Approach (AMA).

2.2 Credit Risk

Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization.

Credit risk is defined as the probability that some of a bank's assets, especially its loans, will decline in value and possibly become worthless. Because banks hold little owners' capital relative to the aggregate value of their assets, only a small percentage of total loans need to go bad to push a bank to the brink of failure. Thus, management of credit risk is very important and central to the health of a bank and indeed the entire financial system. As banks make loans, they need to make provisions for loan losses in their books.

The higher this provision becomes, relative to the size of total loans, the riskier a bank becomes. An increase in the value of the provision for loan losses relative to total loans is an indication that the bank's assets are becoming more difficult to collect (Tshore, Aboagy and Koyerhoah Coleman 2011).

Credit risk is the risk of a loss resulting from the debtor's failure to meet its obligations to the Bank in full when due under the terms agreed (Raghavan 2003).

Credit risk has the highest weight among risks taken by the Bank in the course of its banking activities. Credit risk management in the Bank is carried out using the following main procedures:

- ✓ putting in place limits for operations to limit credit risk;
- ✓ putting in place indicative limits for credit risk concentration and the share of unsecured loan portfolio;
- ✓ creation of security for credit operations;
- ✓ setting value conditions for operations with respect to payment for risks taken;
- ✓ permanent monitoring of risks taken and preparation of management reporting for the Credit Committee, the Bank's management and units concerned;
- ✓ evaluation of regulatory and economic capital necessary to cover the risks taken in respect of the Bank's operations and ensuring its sufficiency;
- ✓ carrying out hedging operations;
- ✓ Permanent internal control over the Bank's units in respect of observing regulations on operations procedure and risk assessment and management procedures by independent units.

The Bank's risk management envisages:

1. Applying systematic approach to overall Bank's loan portfolio risk management and separate operations with certain borrowers/counterparties (group of related borrowers/counterparties);
2. Applying unified methodology for identification and quantitative assessment of credit risk which is adequate to the nature and scale of the Bank's operations; and
3. Balanced combination of centralized and decentralized decision-making in respect of operations related to taking credit risk.

The main tool to restrict and control the credit risk taken by the Bank is the credit limit system. The following types of credit risk limits are put in place:

- ✓ counterparty limits;
- ✓ limits for independent risk-taking by the Bank's branches; and
- ✓ Credit risk limits by countries/industries/regions.

Credit risk limits are determined by the Credit Committee and approved by the Bank's Management Board (in case the Credit Committee does not have the required authority).

A part of authorities for putting credit limits in place is delegated to Branch Credit Committees (for standard credit operations within the special limit for independent credit risk-taking by branches), as well as to the Small Credit Committee and the Moscow Region Credit.

2.2. How to manage credit risk?

As to Laurent Clerc (2004) Participants analyzed the different risk management techniques by taking a look at the following two aspects: the emergence of a risk culture and the prevention of risk by building up regulatory capital in proportion to the level of risk exposure of each credit institution.

Pillar 1 of the new Basel II framework provides banks with several options for calculating their capital requirements relative to their credit risk and their operational risk. The most innovative one is the possibility that banks have been given of using —under the control of the supervisory authorities — their internal assessment systems.

Because calibrating these models tends to come up against the problem of the reliability and availability of data in some emerging economies, the Basel Committee has proposed a simplified standardized approach designed specifically for these economies.

The development of credit derivatives markets is taken into account when drawing up standards that better capture risk and recognizing the most advanced techniques at the prudential level. The following conclusions were drawn from the presentation of the results of the survey conducted under the aegis of the ESCB Banking Supervision Committee: the liquidity of credit derivatives markets has increased sharply, and, contrary to expectations, the transfer of credit risk to insurance companies has marked time. In Europe, activity thus appears to be principally concentrated in the banking sector.

The most standardized instruments, such as credit default swaps (CDSs) account for the lion's share of transactions. As yet, credit risk transfer activities do not appear to have substantially impacted European banks' provisioning needs over the last business cycle.

However, a few aspects remain unclear. They relate to the amounts actually transferred and the complexity of some of the instruments used, such as the CDOs of CDOs(Collateralized Debt Obligations), which seem particularly obscure.

Participants also commented on the decision taken by the Basel Committee in October 2003 to calibrate capital requirements against unexpected losses. This mechanism could have penalized

banks that make greater provisions for their expected losses and resort more dynamic provisioning. In order to prevent this undesirable effect from arising, excess provision amounts are to be integrated into banks' additional capital up to ascertain limit, while any shortfall of provision amounts compared with expected losses is to be deducted from banks' own funds, up to 50% from their core capital (*Tier 1*) and 50% from their additional capital (*Tier 2*).

2.3 Credit assessment & risk grading

2.3.1 Credit assessment

A thorough credit and risk assessment should be conducted prior to the granting of loans, and at least annually thereafter for all facilities. The results of this assessment should be presented in a Credit Application that originates from the relationship manager/account officer (—RMII), and is approved by Credit Risk Management (CRM). The RM should be the owner of the customer relationship, and must be held responsible to ensure the accuracy of the entire credit application submitted for approval. RMs must be familiar with the bank's Lending Guidelines and should conduct due diligence on new borrowers, principals, and guarantors (Laurent Clerc, 2004)

It is essential that RMs know their customers and conduct due diligence on new borrowers, principals, and guarantors to ensure such parties are in fact who they represent themselves to be. All banks should have established Know Your Customer (KYC) and Money Laundering guidelines which should be adhered to at all times.

Credit Applications should summarize the results of the RMs risk assessment and include, as a minimum, the following details:

- Amount and type of loan(s) proposed.
- Purpose of loans.
- Loan Structure (Tenor, Covenants, Repayment Schedule, Interest)
- Security Arrangements

In addition, the following risk areas should be addressed:

Borrower Analysis: The majority shareholders, management team and group or affiliate companies should be assessed. Any issues regarding lack of management depth, complicated ownership structures or inter group transactions should be addressed, and risks mitigated.

Industry Analysis: The key risk factors of the borrower's industry should be assessed.

Any issues regarding the borrower's position in the industry, overall industry concerns or competitive forces should be addressed and the strengths and weaknesses of the borrower relative to its competition should be identified.

Supplier/Buyer Analysis: Any customer or supplier concentration should be addressed, as these could have a significant impact on the future viability of the borrower.

Historical Financial Analysis: An analysis of a minimum of 3 years historical financial statements of the borrower should be presented. Where reliance is placed on a corporate guarantor, guarantor financial statements should also be analyzed. The analysis should address the quality and sustainability of earnings, cash flow and the strength of the borrower's balance sheet. Specifically, cash flow, leverage and profitability must be analyzed.

Projected Financial Performance: Where term facilities (tenor > 1 year) are being proposed, a projection of the borrower's future financial performance should be provided, indicating an analysis of the sufficiency of cash flow to service debt repayments. Loans should not be granted if projected cash flow is insufficient to repay debts.

Account Conduct: For existing borrowers, the historic performance in meeting repayment obligations (trade payments, cheques, interest and principal payments, etc) should be assessed.

Adherence to Lending Guidelines: Credit Applications should clearly state whether or not the proposed application is in compliance with the bank's Lending Guidelines. The Bank's Head of Credit or Managing Director/CEO should approve Credit Applications that do not adhere to the bank's Lending Guidelines.

Mitigating Factors: Mitigating factors for risks identified in the credit assessment should be identified. Possible risks include, but are not limited to: margin sustainability and/or volatility, high debt load (leverage/gearing), overstocking or debtor issues; rapid growth, acquisition or expansion; new business line/product expansion; management changes or succession issues; customer or supplier concentrations; and lack of transparency or industry issues.

Loan Structure: The amounts and tenors of financing proposed should be justified based on the projected repayment ability and loan purpose. Excessive tenor or amount relative to business needs increases the risk of fund diversion and may adversely impact the borrower's repayment ability.

Security: A current valuation of collateral should be obtained and the quality and priority of security being proposed should be assessed. Loans should not be granted based solely on security. Adequacy and the extent of the insurance coverage should be assessed.

Name Lending: Credit proposals should not be unduly influenced by an over reliance on the sponsoring principal's reputation, reported independent means, or their perceived willingness to inject funds into various business enterprises in case of need. These situations should be discouraged and treated with great caution. Rather, credit proposals and the granting of loans should be based on sound fundamentals, supported by a thorough financial and risk analysis.

2.3.2 Risk grading

All Banks should adopt a credit risk grading system. The system should define the risk profile of borrower's to ensure that account management, structure and pricing are commensurate with the risk involved. Risk grading is a key measurement of a Bank's asset quality, and as such, it is essential that grading is a robust process. All facilities should be assigned a risk grade. Where deterioration in risk is noted, the Risk Grade assigned to a borrower and its facilities should be immediately changed. Borrower Risk Grades should be clearly stated on Credit Applications.

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

2.4 What type of risk is being considered?

Commercial banks are in the risk business. In the process of providing financial services, they assume various kinds of financial risks. Over the last decade the understanding of the place of commercial banks within the financial sector has improved substantially.

Over this time, much has been written on the role of commercial banks in the financial sector, both in the academic literature and in the financial press. These arguments will be neither reviewed nor enumerated here. Suffice it to say that market participants seek the services of these financial institutions because of their ability to provide market knowledge, transaction efficiency and funding capability. In performing these roles they generally act as a principal in the transaction. As such, they use their own balance sheet to facilitate the transaction and to absorb the risks associated with it (Santomero 1997).

To be sure, there are activities performed by banking firms which do not have direct balance sheet implications. These services include agency and advisory activities such as

- i. trust and investment management,
- ii. private and public placements through "best efforts" or facilitating contracts
- iii. standard underwriting through Section 20 Subsidiaries of the holding company, or
- iv. the packaging, securitizing, distributing and servicing of loans in the areas of consumer and real estate debt primarily. These items are absent from the traditional financial statement because the latter rely on generally accepted accounting procedures rather than a true economic balance sheet. Nonetheless, the overwhelming majority of the risk facing the banking firm is in on-balance-sheet businesses. It is in this area that the discussion of risk management and the necessary procedures for risk management and

control has centered. Accordingly, it is here that the research review of risk management procedures will concentrate.

2.5 Bank risk management systems

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

Accordingly, the study of bank risk management processes is essentially an investigation of how they manage these four risks. In each case, the procedure outlined above is adapted to the risk considered so as to standardize, measure, constrain and manage each of these risks. To illustrate how this is achieved, this review of firm-level risk management begins with a discussion of risk management controls in each area. The more difficult issue of summing over these risks and adding still other, more amorphous, ones such as legal, regulatory or reputational risk, will be left to the end (Santomero, 1997).

2.5.1 Credit portfolio management

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

The need to better understand portfolio credit risks was reinforced by the publication of the Bank for International Settlements' (BIS) capital adequacy guidelines in 1988.

These guidelines, whilst specifying minimum regulatory capital requirements, were inadequate to provide an accurate measure of the risk/reward characteristics of a credit portfolio. Banks therefore started to develop more sophisticated credit risk management techniques that recognized both the credit risk of individual exposures and the degree to which these risks were diversified.

Banks leading the development of credit risk management techniques quickly discovered that credit pricing was highly inefficient. Typically pricing within a loan portfolio would be almost flat across the credit risk spectrum, generating huge skews in customer profitability. Initial efforts

focused on mitigating these skews by calculating risk adjusted profitability (e.g. risk adjusted return on [risk-adjusted] capital) by sub-portfolio and then using these measures to create risk adjusted loan pricing tools. Leading banks thus started to rationalize pricing in both loan and bond portfolios, and moving under-performing assets off their balance sheets. Consequently banks that had not developed risk-adjusted performance measures started to suffer from negative selection, often accepting significantly under priced assets from more sophisticated institutions.

In parallel to developing aggregate risk-adjusted performance measures, leading banks were also starting to quantify credit risk at finer levels of detail. Credit portfolio models were developed which could differentiate credit risk along multiple dimensions (credit grade, industry, country/region etc) and, for large corporate exposures, on a name-by name basis.

These credit portfolio models have positioned leading institutions to take advantage of the increasing liquidity of the credit markets and to adopt a far more active approach to credit portfolio management than was previously possible. Historically, credit portfolio management had focused on the monitoring of exposure by broad portfolio segment and, if necessary, the imposition of exposure caps. The creation of a stand-alone credit portfolio management function, armed with sophisticated portfolio models and with a controlling mandate over assets held on the balance sheet, now enabled the credit portfolio to be optimized independent of origination activity. Active credit portfolio optimization has enormous potential to enhance

profitability. Using only very basic optimization techniques a typical institution might expect to reduce the economic capital consumed by its credit portfolio by 25%–30%.

2.5.2 Traditional approach

It is hard to differentiate between the traditional approach and the new approaches since many of the ideas of traditional models are used in the new models. The traditional approach is comprised of four classes of models (Achou and Tenguh, 2008).

Expert Systems

In the expert system, the credit decision is left in the hands of the branch lending officer.

His expertise, judgment, and weighting of certain factors are the most important determinants in the decision to grant loans. The loan officer can examine as many points as possible but must include the five —Cs these are; character, credibility, capital, collateral and cycle (economic conditions) in addition to the 5 Cs, an expert may also take into consideration the interest rate.

Artificial Neural Networks:

Due to the time consuming nature and error- prone nature of the computerized expertise system, many systems use induction to infer the human expert's decision process. The artificial neural networks have been proposed as solutions to the problems of the expert system. This system simulates the human learning process. It learns the nature of the relationship between inputs and outputs by repeatedly sampling input/output information.

Internal Rating at Banks:

Over the years, banks have subdivided the pass/performing rating category, for example each time, there is always a probability that some pass or performing loans will go in to default, and that reserves should be held against such loans.

Credit Scoring Systems:

A credit score is a number that is based on a statistical analysis of a borrower's credit report, and is used to represent the creditworthiness of that person¹. A credit score is primarily based on credit report information. Lenders, such as banks use credit scores to evaluate the potential risk posed by giving loans to consumers and to mitigate losses due to bad debt. Using credit scores, financial institutions determine who are the most qualified for a loan, at what rate of interest, and to what credit limits.

2.6 Credit risk measurement framework

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

Volatility of portfolio losses is driven by two factors – concentration and correlation.

Concentration describes the 'lumpiness' of the credit portfolio (e.g. why it is more risky to lend £10m to 10 companies than to lend £0.1m to 1,000 companies). Correlation describes the sensitivity of the portfolio to changes in underlying macro-economic factors (e.g. why it is more risky to lend to very cyclical industries such as property development).

In all but the smallest credit portfolios, correlation effects will dominate.

When quantifying credit risk, two alternative approaches can be used when valuing the portfolio:

Loss-based method: Under this approach an exposure is assumed to be held to maturity.

The exposure is therefore either repaid at par or defaults, and thus worth the recovery value of any collateral. Using this approach credit migration has no effect on the book value of the obligation.

NPV-based method: Under this approach, the embedded value of an exposure is assumed to be realizable. If the obligation upgrades then it is assumed to be worth more than par, and if it downgrades it is assumed to be worth less than par.

The value of the obligation can be calculated using either using market credit spreads (where applicable) or by marking-to-model using CAPM or similar method.

In general, NPV-based methods are most applicable to bond portfolios and large corporate portfolios where meaningful markets exist for either the physical assets or credit derivatives.

For the vast majority of commercial bank exposures, where such markets do not exist a more meaningful risk profile is obtained using a loss-based method. Loss-based calculations have the advantage of requiring less input data (margin and maturity information, for example, is not required) and being simpler to compute.

However, many institutions are starting to run both methods in parallel, particularly for portfolios where securitization is possible.

2.7 Policy guidelines

The fundamental credit risk management policies that are recommended for adoption by all banks in Bangladesh; The guidelines contained herein outline general principles that are designed to govern the implementation of more detailed lending procedures and risk grading systems within individual banks.

Lending Guidelines

All banks should have established Credit Policies (—Lending Guidelines!) that clearly outline the senior management’s view of business development priorities and the terms and conditions that should be adhered to in order for loans to be approved. The Lending Guidelines should be updated at least annually to reflect changes in the economic out-look and the evolution of the bank’s loan portfolio, and be distributed to all lending/marketing officers. The Lending Guidelines should be approved by the Managing Director/CEO & Board of Directors of the bank based on the endorsement of the bank’s Head of Credit Risk Management and the Head of Corporate/Commercial Banking.

Any departure or deviation from the Lending Guidelines should be explicitly in credit applications and a justification for approval provided. Approval of loans that do not comply with Lending Guidelines should be restricted to the bank's Head of Credit or Managing Director/CEO & Board of Directors

The Lending Guidelines should provide the key foundations for account officers/relationship managers (RM) to formulate their recommendations for approval, and should include the following:

➤ **Industry and Business Segment Focus**

The Lending Guidelines should clearly identify the business/industry sectors that should constitute the majority of the bank's loan portfolio. For each sector, a clear indication of the bank's appetite for growth should be indicated (as an example, Textiles: Grow, Cement: Maintain, Construction: Shrink). This will provide necessary direction to the bank's marketing staff.

➤ **Types of Loan Facilities**

The type of loans that are permitted should be clearly indicated, such as Working Capital, Trade Finance, Term Loan, etc.

➤ **Single Borrower/Group Limits/Syndication**

Details of the bank's Single Borrower/Group limits should be included as per Bangladesh Bank guidelines. Banks may wish to establish more conservative criteria in this regard.

➤ **Lending Caps**

Banks should establish a specific industry sector exposure cap to avoid overconcentration in any one industry sector.

➤ **Discouraged Business Types**

Banks should outline industries or lending activities that are discouraged. As a minimum, the following should be discouraged:

- Military Equipment/Weapons Finance
- Highly Leveraged Transactions
- Finance of Speculative Investments
- Logging, Mineral Extraction/Mining, or other activity that is Ethically or Environmentally Sensitive
- Lending to companies listed on CIB black list or known defaulters
- Counterparties in countries subject to UN sanctions
- Share Lending
- Taking an Equity Stake in Borrowers
- Lending to Holding Companies
- Bridge Loans relying on equity/debt issuance as a source of repayment.

➤ **Loan Facility Parameters**

Facility parameters (e.g., maximum size, maximum tenor, and covenant and security requirements) should be clearly stated. As a minimum, the following parameters should be adopted:

- Banks should not grant facilities where the bank's security position is inferior to that of any other financial institution.
- Assets pledged as security should be properly insured.
- Valuations of property taken as security should be performed prior to loans being granted. A recognized 3rd party professional valuation firm should be appointed to conduct valuations.

➤ **Cross Border Risk**

Risk associated with cross border lending. Borrowers of a particular country may be unable or unwilling to fulfill principle and/or interest obligations. Distinguished from ordinary credit risk because the difficulty arises from a political event, such as suspension of external payments

- Synonymous with political & sovereign risk
- Third world debt crisis

2.8 Banks Performance and Its Determinants

The role of bank remains central in financing economic activity and its effectiveness could exert positive impact on overall economy as a sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou et al, 2005). Therefore, the determinants of bank performance have attracted the interest of academic research as well as of bank management, financial markets and bank supervisors since the knowledge of the internal and external determinants of banks profits and margins is essential for various parties.

During the last two decades the banking sector has experienced worldwide major transformations in its operating environment. Both external and domestic factors have affected its structure and performance. Correspondingly, in the literature, bank profitability is usually expressed as a function of internal and external determinants.

The internal determinants refers to the factors originate from bank accounts (balance sheets and/or profit and loss accounts) and therefore could be termed micro or bank specific determinants of profitability. The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions. A number of explanatory variables have been proposed for both categories, according to the nature and purpose of each study (Yuqi Li, 2007).

2.8.1 Internal determinants

Studies dealing with internal determinants employ variables such as size, capital, risk management and expenses management. Size is introduced to account for existing economies or diseconomies of scale in the market. Akhavein et al. (1997) and Smirlock(1985) find a positive and significant relationship between size and bank profitability.

Demirguc-Kunt and Maksimovic (1998) suggest that the extent to which various financial, legal and other factors (e.g. corruption) affect bank profitability is closely linked to firm size. In addition, as Short (1979) argues, size is closely related to the capital adequacy of a bank since relatively large banks tend to raise less expensive capital and, hence, appear more profitable.

Taking the similar approach, Haslem (1968), Short(1979), Bourke (1989), Molyneux and Thornton (1992) Bikker and Hu (2002) and Goddard et al. (2004), all link bank size to capital ratios, which they claim to be positively related to size, results indicated that as size increases. Especially in the case of small to medium sized banks. Profitability rises. However, many other researchers suggest that little cost saving can be achieved by increasing the size of a banking firm(Berger et al., 1987), which suggests that eventually very large banks could face scale inefficiencies.

Other internal factors, such as credit or liquidity are considered as bank specific factors, which closely related to bank management, especially the risk management. The need for risk management in the banking sector is inherent in the nature of the banking business.

Poor asset quality and low levels of liquidity are the two major causes of bank failures and represented as the key risk sources in terms of credit and liquidity risk and attracted great attention from researchers to examine the their impact on bank profitability.

2.8.2 External determinants

Turning to the external determinants, several factors have been suggested as impacting on profitability and these factors can further distinguish between control variables that describe the macroeconomic environment, such as inflation, interest rates and cyclical output, and variables that represent market characteristics. The latter refer to market concentration, industry size and ownership status (Athanasoglou et al, 2005).

2.9 Review of related empirical literature

There have been debate and controversies on the impact of credit risk management and bank's financial performance. Some scholars e.g., (Li Yuqi 2007; Naceur and Kandil 2006; Kinthinji 2010; Kolapo, Ayeni and Ojo 2012; Kargi 2011;) amongst others have carried out extensive studies on this topic and produced mixed results; while some found that credit risk management impact positively on banks financial performance, some found negative relationship and others suggest that other factors apart from credit risk management impacts on bank's performance. Specifically, Kargi (2011) found in a study of Nigeria banks from 2004 to 2008 that there is a significant relationship between banks performance and credit risk management. He found that loans and advances and non-performing loans are major variables that determine asset quality of a bank.

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

Also, Hosna, Manzura and Juanjuan (2009) reemphasized the effect of credit risk management on profitability level of banks. They concluded that higher capital requirement contributes positively to bank's profitability. Muhammed, Shahid, Munir and Ahad (2012) used descriptive, correlation and regression techniques to study whether credit risk affect banks performance in Nigeria from 2004 to 2008. They also found that credit risk management has a significant impact on profitability of Nigerian banks.

Boahene, Dasah and Agyei (2012) used regression analysis to determine whether there is asignificant relationship between credit risk and profitability of Ghanaian banks. They followed theline of Hosna, Manzura and Juanjuan (2009) by using Return of Equity as a measure of bank's performance and a ratio of non-performing loans to total asset as proxy for credit risk management. They found empirically that there is an effect of credit risk management on profitability level of Ghanaian banks. The study also suggests that higher capital requirement contributes positively to bank's profitability.

Li yuqi (2007) examined the determinants of bank's profitability and its implications on risk management practices in the United Kingdom. The study employed regression analysis on a time series data between 1999 and 2006. Six measures of determinants of bank's profitability were employed. They provide liquidity, credit and capital as internal determinants of bank's performance. GDP growth rate, interest rate and inflation rate were used as external determinants of banks profitability. The six variables were combined into one overall composite

index of bank's profitability. Return on Asset (ROA) was used as an indicator of bank's performance. It was found that liquidity and credit risk have negative impact on bank's profitability.

Poudel (2012) appraised the impact of the credit risk management in banks financial performance in Nepal using time series data from 2001 to 2011. The result of the study indicates that credit risk management is an important predictor of bank's financial performance. Fredrick (2010) demonstrated that credit risk management has a strong impact on bank's financial performance in Kenya.

Meanwhile, Jackson (2011) towed the line of Fredrick (2010) by using CAMEL indicators as independent variables and return on Equity as a proxy for banks performance. His findings were also in line with that of Fredrick who also concluded that CAMEL model can be used as proxy for credit risk management. Musyoki and Kadubo (2011), also found that credit risk management is an important predictor of bank's financial performance; they concluded that banks success depends on credit risk management.

Onaolapo (2012), while analyzing the credit risk management efficiency in Nigerian commercial banking sector from 2004 through 2009 provides some further insight into credit risk as profit enhancing mechanism. They used regression analysis and found rather an interesting result that there is a minimal causation between deposit exposure and bank's performance.

Kithinji (2010) analyzed the effect of credit risk management (measured by the ratio of loans and advances on total assets and the ratio of non-performing loans to total loans and advances on return on total asset in Kenyan banks between 2004 to 2008). The study found that the bulk of the profit of commercial banks is not influenced by the amount of credit and non performing loans.

The implication is that other variables apart from credit and non performing loans impact on banks' profit. Kithinji (2010) result provides the rationale to consider other variables that could impact on bank's performance.

The empirical evidence relating to the impact of bank size on credit risk appears to be mixed. For instance, some studies report a negative association between credit risk and bank size (Saunders et al. (1990), Chen et al. (1998), Cebenoyan et al. (1999) and Megginson (2005); Salas and Saurina, (2002); Hu et al (2006)). According to these studies, the inverse relationship means that large banks have better risk management strategies that usually translate into more superior loan portfolios vis-a-vis their smaller counterparts. There are also studies which provide evidence of a positive association between NPLs and bank size (Rajan and Dhal, 2003). In this study the size

variable is constructed by computing the relative market share of the asset of each commercial bank.

Theoretical arguments suggest 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.

Natural logarithm of total assets have been used as a proxy for measuring bank size in most prior research (Ali, Akhtar and Sadaqat (2011), Ahmed, Akhtar and Usman (2011), Ahmad and Ariff (2007) and Das and Ghosh (2007)).

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

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

Chapter Three: Research Methodology

This section deals with the methods of data collection and the methodology employed in the research analysis.

The intention of the study is to empirically examine the quantitative impact of credit risk on the performance of banks in Ethiopia over the period of 5 years.

The researcher employed Secondary data for the purpose of empirical analysis and regression model to analyze data collected from the annual reports of the sample banks. Based on the regression outputs the researcher has conducted the analyses and answered the research question.

3.1 Sample Selection

The researcher has selected seven commercial banks out of nineteen banks operating in Ethiopia as at December 2013. These banks are major commercial banks in the banking industry of Ethiopia and they are selected by looking over duration of time that they stayed in the industry. Also the research tried to include some commercial banks which have a youngest age as compared to the other banks.

The sample banks were: Commercial Bank of Ethiopia (CBE), Awash International Bank (AIB), Bank of Abyssinia (BOA), Wegagen Bank (WB), United Bank (UB), Oromiya International Bank (OIB) and Dashen Bank (DB).

The Banks were selected based on judgmental sampling technique by looking over their operational duration in the industry & suggestion of bank supervisors for the reason that the banks had had immense banking exposure as compared to that of the newly conquered banks in Ethiopia.

Therefore, there are a total of 35 observations in the regression analysis (7 Banks*5 year of operation = 35 Observations)

3.2 Data Collection

The data source for the study used is secondary data, Annual Reports for 5 years, 2009-2013. The study necessitates looking into financial statements within the annual reports of the sample banks which collected from NBE (National Bank of Ethiopia).

3.3 Data analyzing instruments

The researcher uses multiple regression analysis in the study: the relation of one dependant variable to multiple independent variables. The regression outputs are obtained by using SPSS.

3.4 Limitations of the study

The study includes only seven commercial banks in Ethiopia. Therefore, the results cannot be generalized to all commercial banks. The number of observations is very small as comparing with the total banks in the industry.

3.5 Applied regression Model

This study is modeled according to the work of Hosna, Manzura and Juanjuan (2009), Kithinji (2010), Poundel (2012), which studied the effect of credit risk and commercial bank performance. Specifically, the authors adopted the model of Poundel (2012), and specifies that commercial bank's performance (Return on Equity) is influenced by credit risk management (ratio of non-performing loan to loans and advances, ratio of loan loss provision to classified loans and ratio of loans and advances to total deposit).

However, the researcher used CAD (Capital Adequacy) and dropped NPL (Non Performing Loan) from the model in this research. This is because of the NPL data is considered to be confidential by NBE & never be disclosed on commercial banks audited financial statement. Instead the researcher uses LLP (Loan Loss Provision), which has a positive correlation with that of NPL.

Hence, Credit risk can be affected by many factors; the researcher also incorporated some variables like bank liquidity, operating inefficiency & loan growth ratio on the model.

The researcher has employed multivariate regression model which is presented as follow:

ROE= F (Loan loss provision Ratio, liquidity Ratio, operating Inefficiency, loan growth, Capital Adequacy Ratio)

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \dots + \beta_n X_n + \epsilon$$

Standard	The researcher's application
<p>Y – the value of dependent variable; α – the constant term; β – the coefficient of the function; X – the value of independent variables:</p>	<p>Y: ROE (Return on equity)- profitability indicator</p> <p>X1: LLP - credit risk management indicator</p> <p>X2: LR (Liquidity Ratio)- credit risk management indicator</p>

ϵ – the disturbance or error term	<p>X3: OPINF (Operating Inefficiency)- credit risk management indicator</p> <p>X4: LG (Loan Growth)- Credit Risk Management indicator</p> <p>X5:CAR - credit risk management indicator</p>
--------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Where;

ROE = NI/SE= Net Income/Stockholders equity

LLP= LLP/TL = Loan loss Provision/Total Loans

LR = TD/LA =Total Deposit/Total loan

OPINF = TOPE/TA= Total Operating Expense/Total Assets

LG= (current year loan – previous year loan)/previous year loan

CAR =CR/TA= Total Capital/Total assets

It is the regression function which determines the relation of X (LLP, LR, OPINF and CAR) to Y (ROE).

α is the constant term and β is the coefficient of the function, it is the value for the regression equation to predict the variances in dependent variable from the independent variables. This means that if β coefficient is negative, the predictor or independent variable affects dependent variable negatively: one unit increase in independent variable will decrease the dependent variable by the coefficient amount. In the same way, if the β coefficient is positive, the dependent variable increases by the coefficient amount. α is the constant value which dependent variable predicted to have when independent variables equal to zero (if $X_1, X_2, X_3, X_4, X_5=0$ then $\alpha=Y$).

Finally, ϵ is the disturbance or error term, which expresses the effect of all other variables except for the independent variables on the dependent variable that we use in the function.

The ‘a priori expectation’ in the model is that;

Variables	Symbols	Expected sign
ROE	Return on Equity	
LLP	Loan Loss Provision	+Ve
LR	Liquidity Ratio	+/-Ve
OPINF	Operating Inefficiency	+Ve
LG	Loan Growth	+Ve
CAR	Capital Adequacy Ratio	- Ve

Regression analysis output contains values which we discuss below:

R^2 is the proportion of variance in the dependent variable that can be predicted from independent variables. There is also adjusted R^2 which gives more accurate value by avoiding overestimation effect of adding more variables to the function. So, high R^2 value indicates that prediction power of dependent variable by independent variables is also high. Adjusted R^2 is calculated using the formula $1 - ((1 - R^2) * ((N - 1) / (N - k - 1)))$. The formula shows that if the number of observations is small the difference between R^2 and adjusted R^2 is greater than 1 since the denominator is much smaller than numerator. Adjusted R^2 sometimes gives negative value. Since R^2 is adjusted to find out how much fit probably happen just by luck: the difference is amount of fit by chance. Also, negative values of adjusted R^2 occur if the model contains conditions that do not help to predict the response (ROE) or the predictors (LLP, LR, OPINF, LG and CAR) chosen are wrong to predict ROE. R^2 is generally considered to be secondary importance, unless the primary concern is of using regression equation to make accurate predictions. R^2 is an overall measurement of the strength of association, and does not reflect how any independent variable is associated with the dependent variable.

The Probability value (P-value) is used to measure how reliably the independent variables can predict the dependent variable. It is compared to the significance level which is typically 0.05. If the P-value is greater than 0.05, it can be said that the independent variable does not show a statistically significant relationship with the dependent variable.

The F-value calculated as $(R^2/1)/((1-R^2/n-2))$ and associated P-value shall be looked at to measure the effect of the group of independent variables on dependent variable. The resulted F-value should be compared to the critical F-value (F_{V_1, V_2}) which is taken from the F distribution table. Both V_1 and V_2 are called as degrees of freedom. V_1 is number of independent variables and

V_2 is number of observations minus number of independent variable minus 1. For instance, in this research case, we have five independent variables and 35 observations, then $V_1=5$, and $V_2=n-k-1=35-5-1=29$. Thus the critical value of F (5, 29)

If the resulted F-value exceeds the critical F-value, it can be said that the regression as a whole insignificant.

In the regression model, the researcher considered the following:

3.5.1 Dependent variable

The researcher has decided to use ROE as the indicator of the profitability in the regression analysis because ROE along with ROA has been widely used in earlier research. Initially, it is considered the ratios ROE and RORAC (Profit after Tax/Risk Adjusted Capital). RORAC (Return on Risk Adjusted Capital) is a measure for relative performance of the banks and could have been used in our regression analysis. However, the researcher have not used RORAC because it is usually used by the banks with internally available information, for example, risk-adjusted capital, for this matter the researcher do not have access to such required information. Therefore, the researcher has decided to use ROE as the indicator of profitability.

3.5.2 Independent variables

The researcher has chosen five independent variables namely Loan Loss Provision, Liquidity Ratio, Operating Inefficiency, Loan Growth and Capital Adequacy Ratio because these variables are the indicators of risk management which affect the profitability of banks. The researcher have collected there consecutive amounts from the balance sheet of the banks in their annual reports.

Chapter Four: Empirical Findings and Analysis

In this chapter, the researcher presents the results of the research regression model. The researcher has analyzed the results and describes the impact of credit risk management on profitability.

Result of inferential statistics

Before running regression analysis, formal statistical procedures employed in order to examine whether assumptions held for the multiple linear regressions were fulfilled or not. In line with this, detail assessments were carried on with respect to assumptions presented in chapter 3. Results of evaluations conducted through adopting different statistical tools indicated that, normality, constant variance, Multicollinearity, no auto-correlation of errors and no outliers influence are fulfilled in this study (See the outputs displayed in appendix).

Measure of goodness of fit

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.648	.420	.320	15.32198	.902

The above table implies that the model is significance. That means the explanatory variables included (ROE, LLP, LR, LG, OPINF & CAD) in the model explains the dependent variable that is the amount of variation of dependent variable explained by 42%.

ANOVA

Model		Sum of Squares	Df	Mean Square	F	P value.
1	Regression	4938.581	5	987.716	4.207	.005
	Residual	6808.126	29	234.763		
	Total	11746.707	34			

From the above table the overall test of the model is statistically significant (since P value <0.05). This indicates that at least one of coefficients of independent variables is differ from zero. Therefore, the model is useful that means dependent variable (return on equity) explained by at least one of the explanatory variables.

Coefficients

Model	Un-standardized Coefficients		Standardized Coefficients		P Value	Co-linearity Statistics	
	B	Std. Error	Beta	t		Tolerance	VIF
(Constant)	81.917	17.759		4.613	.000		
Loan loss provision	2.830	0.627	.294	4.519	.013	.700	1.429
Liquidity ratio	-.468	.123	-.393	-3.804	.014	.478	2.092
Operating inefficiency	15.491	7.188	.423	2.155	.040	.519	1.928
Loan growth	.184	.044	.172	4.113	.015	.833	1.200
Capital adequacy ratio	-1.095	.605	-.308	-3.590	.021	.688	1.454

a. Dependent Variable: Return on Equity

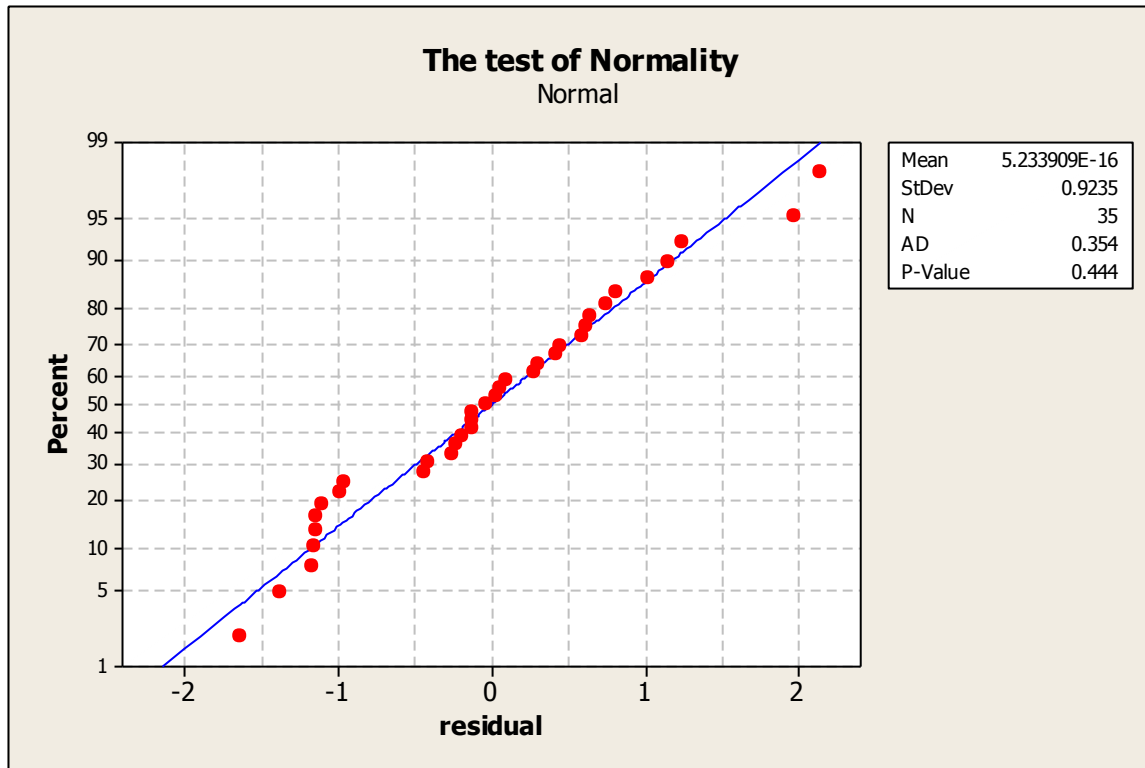
From the above table the intercept of return on equity is statistically significant (since P-value $0.000 < 0.05$). It indicates that the value of dependent variable is 81.917 when all independent variables coefficients are zero.

The loan loss provision, operating inefficiency and loan growth exhibited positive & statistically significant effect on the return on equity. The coefficient of loan loss provision is 2.830 indicated there is direct relationship between loan loss provision & return on equity. Since P-value is 0.013 which is less than 0.05 which implies that loan loss provision has significant effect on return on equity. Hence, as loan loss provision increases by one unit return on equity increase by 2.830 assuming the effect of other explanatory variables held constant.

The operating inefficiency has given a positive & statistically significant effect on the return on equity. Its coefficient is 15.491 which indicate that there is a direct relationship between operating inefficiency & return on equity. Since its P-value is 0.040 which is less than 0.05, implies that operating inefficiency has significant effect on return on equity. Hence, as operating inefficiency increases by one unit return on equity increase by 15.491 assuming the effect of other explanatory variables held constant.

In other hand the loan growth has also resulted with a positive & statistically significant effect on the dependent variable, return on equity. Its coefficient is .184 which indicates that there is a direct relationship between loan growth & return on equity. Since its P-value is .015 which is less than 0.05, implies that it has significant effect on return on equity. Hence, as loan growth increases by one unit return on equity increases by .184 assuming the effect of other explanatory variables held constant.

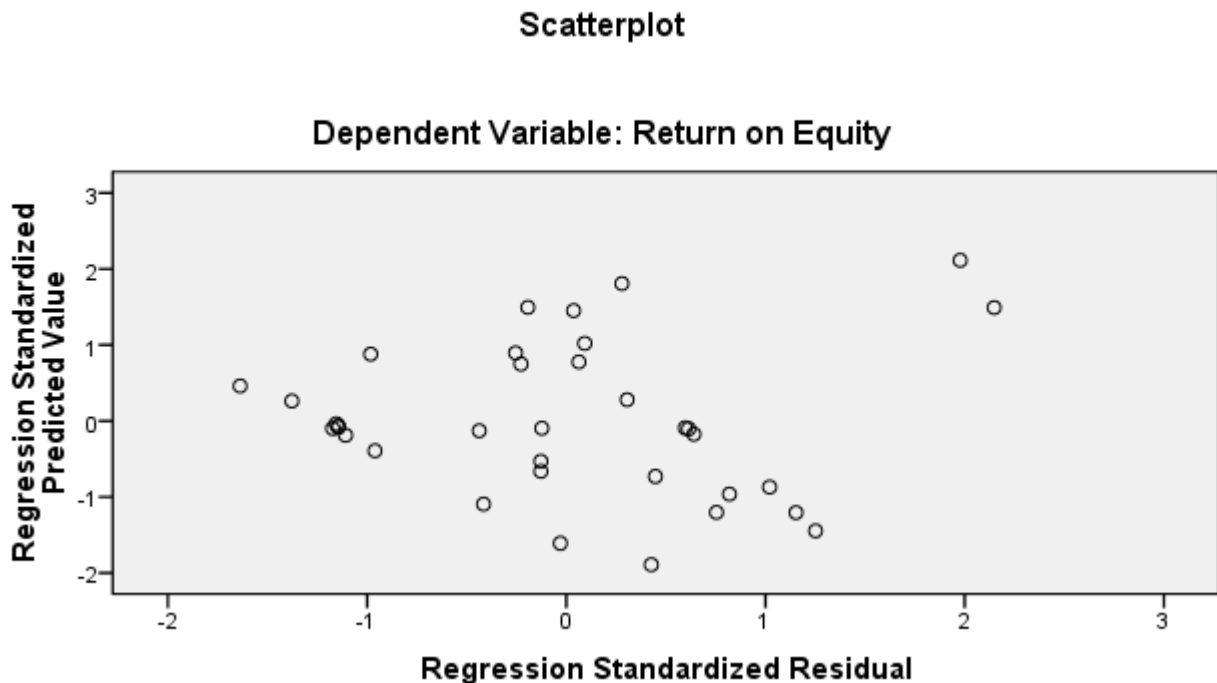
Finally, the findings revealed that liquidity and capital adequacy have a negative but statistically significant relationship with return on equity. Both of them have a coefficient of -.468 and -1.095 respectively.



The P-value is 0.444 > than 0.05, these indicate that don't reject the null hypothesis. The null hypothesis says the data comes from normal population. Therefore the assumption of normality fulfills.

Test of constant variance

Plots of residual against predicted were used to examine the variance of the error term were constant or not. As shown in below Figure, the spread of the residual does not follow an increasing or decreasing pattern, thus we can say the residuals are homoscedastic.



Test of Multi co-linearity

To check whether these correlations create the so called multi co-linearity problem, a formal assessment is done using variance inflation factors.

In this assessment, first VIF is applied to detect multi co-linearity in the model. It has been noted that if any of the VIF is greater than 10, those variables are highly related to the other regressors. But in all cases as shown in above Table, it is found that none of the variance inflation factor is greater than 10. Therefore this implies that there is no problem of co-linearity between the independent variables used on this research.

Testing the residuals for Autocorrelation

Formal test of residuals for autocorrelation

1. One can use the Durbin-Watson d test, to test for first-order autocorrelation, that is

$$H_0: \rho=0; H_1: \rho \neq 0 \text{ at } \alpha = 0.05$$

Note that under the null the errors at $t-1$ and t are independent or the observations are not serially dependent. The Durbin-Watson d statistic is obtained as 0.902. This indicate don't reject the null hypothesis. Therefore the errors aren't correlated.

Chapter Five: CONCLUSION & RECOMMENDATION

5.1 Conclusion

This study is modeled according to the work of Hosna, Manzura and Juanjuan (2009), Kithinji (2010), Poundel (2012), which studied the effect of credit risk and commercial bank performance. Specifically, the authors adopted the model of Poundel (2012), and specifies that commercial bank's performance (Return on Equity) is influenced by credit risk management (ratio of non-performing loan to loans and advances, ratio of loan loss provision to classified loans and ratio of loans and advances to total deposit).

However, the researcher tried to encompass other credit risk determinant variable which enables to meet the aim of the research (i.e., to describe the impact level of credit risk management on profitability in seven commercial banks in Ethiopia for the period 2009 to 2013). A balanced panel data of seven commercial banks and 35 observations have been used for the analysis.

The regression results revealed that the loan loss provision, operating inefficiency and loan growth exhibited positive & statistically significant effect on return on equity and there coefficient indicates that there is direct relationship between them & return on equity.

Based on this implication the researcher concludes that, for instance, the higher the loan provision becomes, relative to the size of total loans, the riskier a bank becomes. An increase in the value of the provision for loan losses relative to total loans is an indication that the bank's assets are becoming more difficult to collect (Tshore, Aboagy and Koyerhoah Coleman).

Concerning about operating efficiency, Ali, Akhtar and Sadaqat (2011) found a negative but insignificant relationship with credit risk of Pakistan commercial banks. Inefficient managers will not cope successfully with the process of granting and monitoring loans that will lower the banks' credit quality and bring about a growth in problem loans (Salas and Saurina, 2002). Inefficient banks hold riskier portfolio (Lis, Pages and Saurina, 2000). As studied by Berger and De Young (1997), poor management in the banking institutions results in bad quality loans, and therefore, escalates the level of non-performing loans. They argue that bad management of the banking firms will result in banks inefficiency and affects the process of bank's basic function, granting loans. This basically implies that it will affect banks profitability as long as banks' are relying on the income generated from granted loans. This is also could be resulted for the reason that banks' management might not thoroughly evaluate their customers' credit application due to their poor evaluation skills. Therefore, banks' inefficiencies might lead to higher non-performing loans.

Regarding about loan growth implies credit expansions of commercial banks. Excessive rapid loan growth, as well as sharp declines in bank capital levels are useful pointers to the deterioration in the financial health of banks and can be employed as early warning indicators of future problem loans (Das and Ghosh, 2007). Previous literature shows growth in loan is a cause for credit risk. A strong loan growth translates into significantly higher credit losses with a lag of 2-4 years (Hess, Grims and Holmes, 2009) as a result, based on the implication of the regression result, the researcher concludes this kind of loan growth affects the profitability of commercial banks.

Also, the results indicate that liquidity & capital adequacy has a negative but statistically significant relationship with return on equity. The researcher believes that the regulatory requirements of NBE for these two determinants are fulfilled by the banks & these enables the banks to mitigate the credit risk which the banking industry could face with which having a negative impact on their profitability (return on equity).

Finally, the researcher concludes that there is a significant relationship between Ethiopian commercial banks' performance and credit risk management similar result with that of other authors mentioned on this research literature review part.

5.2 Recommendation

As stated in the literature review part of this study & based on the results obtained from the research, commercial banks of Ethiopia have been positively affected their profitability due to credit risks.

The research findings clearly show that the commercial banks had much emphasis on the legally inspected credit risk factors, like that of liquidity & maintain CAD during there establishment.

However the commercial bank's should also give due attention to that of the mentioned independent variables & other variables which could have the possibility to affect the profitability of commercial banks just for the sake of obtaining good profitability even though they are not legally forced by NBE.

Chapter Six- REFERENCES

Akhavain, J.D., Berger, A.N., Humphrey, D.B., (1997). "The effects of mergers on efficiency and prices: evidence from a bank profit function" Finance and Economic Discussion Series 9, Board of Governors of the Federal Reserve System

Ali, K., Akhtar, M., & Sadaqat, S. (2011), Financial and Non-Financial Business Risk Perspective—emperical Evidence from Commercial Banks, Euro journal Publishing.

Anthony M. Santomero (1997), Commercial Bank Risk Management: an Analysis of the Process, Wharton Financial Institution Center.

Athanasoglou, P., Brissimis, S N., and Delis, M D. (2005),"Bank-specific, industry specific and macroeconomic determinants of bank profitability". MPRA Paper No.153

Basel Committee on Banking Supervision (2001).Risk Management Practices and Regulatory Capital: Cross Sectional Comparison (available at www.bis.org).

Boahene, S. H. Dasah, J and Agyei S. K. (2012),"Credit risk and profitability of selected banksin Ghana" Research Journal of finance and accounting.

Demirguc-Kunt, A., Huizinga, H., (1998)."Determinants of commercial bank interest margins and profitability: some international evidence". World Bank Economic Review 13.

Epure, M. and Lafuente,I (2012). Monitoring Bank Performance in the Presence of Risk, Barcelona GSE Working Paper Series No. 61

Fredrick O. (2010), "The impact of credit risk management on financial performance ofcommercial banks in Kenya". DBA African Management Review

Haslam,. and John A., (1968), .A statistical analysis of the relative profitability of commercial banks., Journal of Finance,

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

Hunter, J. (2002),"Improving organizational performance through the use of effective elements of organizational structure", International Journal of Health Care Quality Assurance incorporating Leadership in Health Services, Vol. 15(3).

Jackson O. (2011),"The impact of credit risk management on financial performance ofcommercial banks in Kenya". University of Nairobi

Kargi, H. S. (2011), "Credit risk and the Performance of Nigeria banks" Ahmadu Bello University Zaria.

Kinthinji, A. M. (2010), "Credit risk management and profitability of commercial banks in Kenya".

kolapo, T. F, Ayeni R. K. and Oke, O. (2012), "Credit Risk Management and Banks Performance" Australian Journal of Business and Management Research.

L.Clerc (2004), Credit Risk Management & Financial Stability, Economic Analysis and Research Directorate, Monetary and Financial Policy Research Division

Liyuqi (2007), "Determinants of Banks profitability and its implication on Risk management practices: Panel Evidence from the UK". University of Nottingham.

Mishkin, (2004), Introduction to Money and Banking 4th ed.

Muhammed et al (2012), "Credit risk and the performance of Nigerian banks" interdisciplinary Journal of contemporary research in business.

Musyoki, D and Kadubo, A. S. (2011), "The impact of credit risk management on the financial performance in Kenya". International Journal of Business and Public Management

Onaolapo, A. R. (2012), "Analysis of credit risk management efficiency in Nigerian commercial banking sector" Far East Journal of Marketing and Management.

Poudel, R. P. S. (2012), "The impact of credit risk management in financial performance of commercial banks in Nepal". International Journal of arts and commerce

R.S. Raghavan(2003), Risk Management in Banks.

Short, B.K., (1979), .The relation between commercial bank profit rate and banking Concentration in Canada, Western Europe and Japan, Journal of Banking & Finance 3.

Takang Felix Achou and Ntui Claudine Tenguh (2008), Bank performance and credit risk management. University of Skoved: School of technology and society

Yuqi Li , Determinants of Banks. Profitability and its Implication on Risk Management Practices: Panel Evidence from the UK in the Period 1999-2006

Zribi, N. and Younes, B. (2011), the factors influencing bank credit risk: The case of Tunisia. Journal of accounting and taxation Vol.3(4) PP. 70-78.