CHAPTER-I

INTRODUCTION

The study's history and main idea have been covered in this chapter. The study background, problem statement (including research questions), study objectives, and study significance are all included. As a result, it gives specific information about the next chapter.

1.1. Background of the study

Risk is an element that is inherent to banking operations. Simply put, risk is the unpredictability of a future circumstance or event, and for banks, it's the uncertainty of the results of business investments. The numerous banking risks can be divided into categories such as operational risk, liquidity risk, market risk, compliance risk, credit risk, cyber security risk, and strategic risk. For commercial banks, Credit Risk stands out among these as the most significant sort of risk. The organized lending system will never run out of dangers. Risk is a given for banks and other financial institutions, whether it be operational, market, liquidity, credit, or interest-related. Therefore, risk profiling is given utmost priority in all financial organizations (Bhattarai, 2019).

Credit risk is one of the constant threats that have consistently cost institutions. The easiest way to describe this risk is the possibility that a loan will not be repaid to the lender according to the terms agreed upon, destroying the lender's investment. Credit risk results from a bank's lending activities. Simply put, credit risk is the risk a bank takes when making a loan to a borrower. They could go into default and fail to make the required payments on schedule, costing the bank money. Loan portfolio management is crucial, but often a bank cannot fully predict whether it will be able to recover the money because even though the borrowers have been making their payments on time, the economy may change and make things differently than they have in the past. What do banks do as a result? Their credit risks must be managed (Chhetri, 2021).

The practice of credit risk management involves minimizing losses by determining if a bank's capital and loan loss reserve are enough at any particular time. Maintaining credit risk exposure within appropriate and acceptable bounds is the aim of credit risk management in banks. Banks must manage both the entire portfolio and specific credits in order to control credit risk. The executive management team can identify which

prospective customers may pose risks that are above their predetermined risk threshold by monitoring credit risk (Abiola, 2011).

A bank's profitability is decreased, its assets' quality is affected, and the amount of loan losses and non-performing loans increases due to improper credit risk management, all of which can eventually cause financial difficulty. Additionally, better credit risk management offers the chance to significantly boost overall performance and gain a competitive edge. Gaining a thorough grasp of the bank's overall credit risk by looking at risk at the individual, customer, and portfolio levels is the first stage in successful credit risk management.

A bank's performance is gauged by its profitability. Banks turn a profit when they generate or create more money than they spend on expenses. A bank's primary sources of income are the service fees it charges for its products and the interest it earns on its assets. Interest on its liabilities is one of its primary costs (Shrestha, 2020).

Banks are currently the biggest financial organizations in the world, having locations and affiliates in every aspect of a person's life (Pandey, 2005). Commercial banks must deal with hazards when they are in operation, though. Given that issuing credit is one of the primary sources of income in commercial banks, credit risk is one of the most serious hazards that banks face. Therefore, how the risk associated with that credit is managed determines how profitable the banks are. The research's objective is to accurately inform stakeholders about the commercial banks' credit risk management practices and how they affect their financial performance.

1.2. Statement of the problems

New patterns in banking and financial institution growth, operation, and establishment support the development of the banking sector in Nepal. In order to expand the financial sectors, the regulator has incorporated certain revisions to its laws that address concerns about mergers and acquisitions, upgrades, and creating branches in distant locations. Various locations and activities that banks engage in on a daily basis are distinctive. Some banks are working hard to introduce new deposit options with high interest rates, while others are attempting to attract clients by lowering loan interest rates. Therefore, there is fierce competition throughout Nepal's banking sector.

Because customer deposits account for more than 85% of a bank's liability, most of its activity is extremely delicate (Saunders and Cornett, 2011). Loans are the main source of

income for banks because they are made from deposits provided by customers. The measure, however, carries a significant risk for both banks and customers. Banks give loans and advances that cannot be repaid because to vastly rising non-performing loans in an effort to boost income and increase their market position. The bank and other stakeholders are under stress because of this. The regulating body of the bank and financial institution (Nepal Rastra Bank) has ordered the credit loss provision in order to control this kind of circumstance. The study's goal is to answer the following research question in regard to the chosen banks in order to identify these issues.

i. What is the present condition of ROA, CAR, NPLR, CDR and MQR of commercial bank in Nepal?
ii. What is the relationship of CAR, NPLR, CDR and MQR with ROA of commercial bank in Nepal?
iii. Is there effect of CAR, NPLR, CDR and MQR on profitability (ROA) of commercial bank in Nepal?

1.3. Objectives of the study

The evaluation of Nepalese commercial banks' credit risk management procedures is the primary objective of this study. This study looked at the sample banks' overall approach to managing credit risk. The study has specific aims as well as a general objective.

i. To assess the present condition of ROA, CAR, NPLR, CDR and MQR of commercial bank in Nepal.
ii. To analyze relationship of CAR, NPLR, CDR and MQR with ROA of commercial bank in Nepal.
iii. To examine the effect of CAR, NPLR, CDR and MQR on the profitability (ROA) of commercial bank in Nepal.

1.4. Rationale of the study

Credit risk management is crucial for banks and other financial institutions to maintain operations and protect the interests of all stakeholders. The suggested study will be extremely helpful to commercial bank executives and relationship managers in terms of how they should manage loan portfolios and what crucial financial criteria must be followed when managing credit risk (Li and Zou, 2014).

Through the effective credit risk management the business is able to greatly improve the overall performance and secure a competitive advantage. The goal of the credit risk

management in banks is to maintain credit risk exposure within the proper and acceptable parameters.

The study itself is crucial since it tries to apply theory and knowledge in real-world situations. The major goal of this study is to examine credit risk management and how it affects the financial success of Nepalese commercial banks. In order to complete the necessary academic work, the researcher needs to conduct research. For the Nepalese banking industry, the study is essential to ensuring that the riskiest strategies are being implemented to optimize financial returns and expansion markets. To comprehend the condition of their own bank, each sample bank must carry out the research. To understand the state of Nepalese commercial banks, this study is crucial for all stakeholders, including clients, staff, shareholders, society, and regulars. Additionally, it aids in the formulation of regulatory measures.

1.5. Limitation of the study

This study has some limitations, some of which are as follows.

Limitation in research area: The commercial bank, development bank, finance company, and micro-finance financial institution are the four categories under which Nepal Rastra Bank has divided banks and financial institutions. However, this study is only able to examine Nepal's commercial banks; it ignores all other forms of financial institutions.

Time period: This study used information from Nepalese commercial banks for the seven-year financial period from 2072/73 to 2078/79. Therefore, the information from this seven-year financial era does not reflect the outcomes from the past.

Sample size: The five commercial banks in Nepal were used as a sample in this study. The performance of the five Nepalese commercial banks used as a sample may not be accurate.

1.6. Organization of the study

The five chapters that make up the study structure are as follows:

Chapter –I: Introduction

The study's history and main idea have been covered in this chapter. The study background, problem statement (including research questions), study objectives, and study significance are all included. As a result, it gives specific information about the next chapter.

Chapter –II: Literature review

The study has been linked in a chain of research that is advancing and emerging knowledge in the relevant domains, and it identifies the research gap through a review of the literature.

Chapter –III: Methodology

The techniques for determining the connection between credit risk management and commercial bank performance have been covered in this chapter. The descriptive statistics for the numerous variables used in the study conclude this chapter.

Chapter –IV: Results and discussion

This chapter has presented the empirical findings of the study and discussion.

Chapter –V: Summary and Conclusion

The study's findings are presented in this chapter. It began with an overview of the findings and concludes with recommendations and a description of the direction and scope of additional research.

CHAPTER –II

LITERATURE REVIEW

This chapter contains the relevant literature on the subject. It has discussed the theory of credit risk management and profitability along with actual studies pertaining to credit risk management and its effect on the profitability of Nepalese banks and banks in other countries. The conceptual framework is then included to help understand the elements that could impact the financial performance of the bank. The portions after this one are further broken down into conceptual and empirical review.

2.1. Conceptual review of the literature

The conceptual review of the study is described below as.

2.1.1 Concept of credit

Credit is money that a bank or other organization allows a person or corporation to use now and then repay later. Credit is defined as funds that are lent by the creditor (bank) to the borrower (customers), either with or without security. A bank's total quantity of credit is how much money it lends.

A significant line item on the asset side of a commercial bank's balance sheet is credit and advances. One of the main sources of income for banks is interest earned on credits and advances. If the bank does not prepare its credit portfolio, bad debts will simply increase and negatively impact profits.

Credit is a legal arrangement whereby a borrower (customer/client) borrows money from a lender (usually a bank) with the promise to pay back the money within the specified time frame and on the specified conditions, together with interest.

2.1.2 Types of credit

There are many types of credits. Some of them are given below.

i) Overdraft

A bank account deficit results from taking out more money than is available in the account. It speaks of a surplus of withdrawals compared to deposits. If there has been a prior agreement with the account provider for an overdraft and the amount overdrawn is within the permitted overdraft limit, interest is frequently assessed at the agreed rate. The

negative balance may be subject to additional fees and/or higher interest rates if it exceeds the terms set forth in the agreement.

ii) Term credit

It refers to cash given to debtors in a single lump payment. word credit is the word used to describe bank loans having maturities longer than one year. The company undertakes to repay the principal in the scheduled installments and to pay interest at the prime rate set by the bank. To suit the unique requirements of the company, unique main payment schedules might be negotiated.

iii) Working capital credit

The difference between current assets and current liabilities is known as working capital. The customers receive it in order to fill their working capital gap and support the production process.

iv) Real estate credit

Customers of financial organizations can also obtain real estate credit. There are various real estate financing options, including those for the development of warehouses, commercial complexes, and residential buildings. It is offered to people who have a steady source of income or who can profit from real estate projects themselves.

v) Project credit

Customers are given project credit based on how viable the project is. The borrowers must provide a specific amount of their own equity to the project, and the remaining funds will be provided as project credit. Short-term credits created with the intention of completing proposed projects are known as construction credits.

vi) Bank guarantee

Up to the allowed limit, it is utilized for the benefit of the customer in favor of the other party (beneficiary). Typically, a set percentage of the customer's purchase price is deducted as margin and credited to the customer's margin account.

vii) Letter of the credit (L/C)

A letter of credit, often referred to as a documentary credit or banker's commercial credit,

is a payment method used in international trade to carry out the same economic task as a guarantee by allocating risk taken on by contractual parties.

2.1.3 Credit classification on the basis of Loan loss provision

The Nepal Rastra Bank (NRB) has adopted a provision on the classification of loans from banks and financial institutions in accordance with the Unified Directive 2079. According to the length of the credit's overdue term, the BFIs must divide the loan into two primary categories.

1) Performing Loan

- **Pass Loan:** When a loan's balance is neither past due nor past due by more than one month, it is classified as a pass loan. Loan made with a fixed deposit receipt as security. Loan made with bonds, government securities, and debentures of Nepal Rastra Bank as security. Up to 10 lakhs in credit may be obtained with gold and silver as security.
- **Watch list:** Loans that are more than three months past due are listed on the watch list. Not renewed in a month or having a short-term loan with a 90-day grace period. Loans are given to people who are listed as defaulting on their obligations by other BFIs.

2) Non-Performing Loan

- **Sub Standard:** Up to six months late, or 3-6 months.
- **Doubtful:** Up to a year late, or 6 to 12 months.
- **Loss:** more than a year overdue.

Loan Loss Provision in Nepal

To reduce potential losses, banks must retain loan loss provisions based on the types of loans. The provisioning amount is deducted from the bank's profit. The bank is required to sustain the loss from the provisioning reserve if the debtor refuses to repay the money. Following are the minimum loan loss provisions that the NRB has mandated for certain loans (Unified Directive 2079).

Table No. 2.1

Loan Loss Provision in Nepal

Loan Classification	**Meaning**	**Min. Provision**
Pass Loan	Not any overdue/Overdue up to 1 month	1.3 % of the loan.
Watch list	Overdue up to 3 month i.e 1-3 months.	5% of the loan.
Sub-standard	Up to six months late, or 3-6 months.	25% of the loan.
Doubtful	Up to a year late, or 6 to 12 months.	50% of the loan.
Loss	More than a year overdue.	100% of the loan.
Restructuring and Rescheduling	An alterations made to the terms and conditions (other structure) and timing of the loan (credit period) between is restructuring and rescheduling.	12.5 % for the pass loan 25% for the substandard 50% for the doubtful and 100% for loss.

The bar for provisioning for loan loss on loans given by BFIs taking into account firms affected by COVID has been raised to up to 5% by Nepal Rastra Bank. The central bank revised the Unified Directive and increased the loan loss provision on all "pass loans" issued by all A, B, and C class financial institutions by 0.3%. BFIs now have to keep the loan loss provision on such credits at 1.3% instead of the previous 1% while drafting their annual financial statement.

2.1.4 Concept of risk

By acting as a financial middleman, financial institutions assist in transferring money deposited by diverse surplus units to deficit units. Risk, one of the contemporary financial studies' pertinent topics that have drawn particular attention from academics and professionals, is something they encounter when executing this position. Any banking institution's success is largely influenced by how well it manages its risks. The ability of a bank to produce profit and maximize the wealth of its shareholders is dependent on its attitude toward risk and risk management, according to Boahene et al. (2012). The

banking industry is risky; hence a bank's ability to do so depends on how it manages risk.

Risk is the likelihood that the outcome will differ from what was anticipated. Thus, there is a chance that the actual outcome will differ from what was anticipated. Risk is defined in the banking industry as the total of dangers that are likely to materialize before the borrower pays back the loan and any other obligations.

Financial institutions frequently engage in actions that subject them to a variety of risks in their effort to maximize shareholder wealth and turn a profit. Five distinct categories of risk associated with the operation of any financial institutions are listed by Lidgerwood (1993). These include the risks associated with credit, interest rates, foreign exchange, and capital adequacy.

The Basel Committee categorized bank risk into three main categories in 2001. credit risk, operational risk, and market risk, to name a few. This committee defines credit risk as a borrower's inability to fulfill their debt obligations.

2.1.5 Bank risk

Risks are managerial uncertainties that might cause a bank to lose money and go out of business. Risk is the likelihood that the outcome will differ from what is anticipated. The Basel Accord states that the banks must deal with credit risk, market risk, and operational risk. The danger of losing money if a borrower doesn't make their payments on time for a loan or other line of credit. Aggressive lending, poor portfolio management, and a lax monitoring system, among other factors, may put banks at danger. Credit risk is the unfavorable shock that the bank can experience as a result of the causes mentioned above. Market risk is the possibility of losses in both on and off balance sheet positions as a result of changes in market pricing.

Interest risk and foreign exchange risk are addressed through the capital treatment for market risk. Operational risk is described as the possibility of a bank experiencing negative consequences as a result of inadequate management of its people, processes, and technology. It could also be impacted by the surroundings outside. The dangers are listed below.

2.1.5.1 Credit risk

Credit risk is the possibility of a debt default brought on by a borrower or counterparty

failing to make payments in accordance with the terms and circumstances set forth in the contract. The Basel Accord states that the purpose of credit risk management is to increase the risk-adjusted rate of return for banks while keeping credit risk exposure within reasonable bounds. The likelihood that a borrower would default on a loan or fail to uphold a contractual obligation is known as credit risk. It usually refers to the possibility that a lender won't get their own principal and interest, which would disrupt their cash flow and increase their collection costs.

The majority of the banking industry's activities, lending, is correlated with credit risk. As a result, the likelihood threat in commercial banks is hazardous. The uncertain possibility that a bank loan will lose all of its value and become worthless in the end is known as credit risk. For the bank to be in excellent shape, credit risk management is crucial. A provision for loan loss must be made in the bank's accounts when it issues a loan, per instructions from the Nepal Rastra Bank.

Credit risk is the possibility of suffering a loss if the debtor fails to pay the bank's obligations in full when due and according to the terms negotiated (Raghavan 2003). Han (2015) defines credit as the potential losses to banks from borrowers who are unable to make their payments. Insufficient institutional capacity, inappropriate loan guidelines, fluctuating interest rates, ineffective management, inappropriate regulations, an increase in bank negligence in credit valuation, ineffective lending method, government interference, and insufficient central bank oversight are some of the major causes of credit risk identified by Alkhouri (2010). According to the definitions and research views presented above, credit risk is a serious illness that, if improperly managed, can result in serious financial issues.

2.1.6 Concept of risk management

There are several factors that contribute to bank collapse, according to many academics. One of these credit risk management practices has been found to be the main cause of the banking issues. Loans make up the majority of a bank's equity (Kitua 1996). This refers to any deterioration in loan quality brought on by significant issues in the banking industry.

It is difficult to distinguish between good and poor borrowers if there are information irregularities between banks and financial organizations. Therefore, the bank must implement a system to assess and evaluate the credit worthiness of borrowers in order to prevent moral hazard and adverse selection, which result in a significant buildup of

nonperforming loans in their records.

Two models are used to determine the characteristics of borrowers. The qualitative and the quantitative are them. Credit scoring model is the name given to the qualitative (Hefferman, 1996). On the other hand, the quantitative model aids in statistically bringing to bear the factors that affect credit risk and evaluating the strength of these elements. The quantity of risks is monitored by credit risk management in order to reduce credit risk. A successful credit risk management system is employed by the majority of banks in their day-to-day operations, which has led to their success.

Paudel (2012) asserts that good and efficient credit risk management is crucial to bank performance. Therefore, credit risk management is a crucial component of a bank's financial health.

2.1.7 Credit policies

The foundation of loan management is credit policy, and it delegated the creation of credit policy to the board of directors and high level management. It serves as a basis for deciding what sort of credit facilities should be offered to customers.

A technique known as a credit policy directs bank employees on how to handle credit applications. According to Nwankwo (1980), the purpose of credit policy is to give businesses direction by providing a very good and standard system that is typically derived from the bank's operational significance and by satisfying the customer's credit-related needs while fully comprehending the government's prohibited fiscal and monetary instructions. Three basic categories of credit policy were identified by Adekanye (2010). The first is a severe credit policy, the second is a lax credit policy, and the third is a moderate credit policy. Banks with no development plans to grow at a pace greater than the minimum one implement a conservative credit strategy. Such a bank does not want to take more risk than is necessary and prefers to do business with clients whose installment payment practices never deviate from the law. Due to the likelihood of a bigger loss of receivables, the liberal credit policy is classified as having a higher risk. The liberal and restrictive policies are combined to form the moderate credit policy. In this policy, lending is increased and risk is minimized.

2.1.8 Mitigation of credit risk

Banks must work to reduce their credit risk in order to manage credit risk. Here are a few

of the common methods for reaching those goals:

i) Risk- based pricing

It is a method that is used to determine the interest rate for loans supplied depending on the risk or likelihood of default.

ii) Covenant

Banks typically demand the debtor to meet certain conditions in their deal contracts, such as maintaining a specified capital level.

iii) Credit insurance

Any losses incurred as a result of uncollectible receivables are covered by credit insurance. In addition to late payments, it also covers bankruptcy.

iv) Collaterals

The counterparty carries the credit risk in a transaction and requests collateral from the opposing counterparty to lower the credit risk for banks.

2.1.9 Credit risk management strategies

The bank uses credit risk management techniques to reduce the impact of credit risk. A thorough credit risk management structure is crucial for growing income. The following are the primary philosophies behind credit risk management strategies, according to Lindergren (1987). They include the creation of a clear structure, the distribution of authority, discipline, and effective communication at all levels. The following strategies are some that can be used to reduce credit risk.

i) Selection

Gestel et al. (2009) claim that a good CRM starts with carefully selecting the borrowers and goods that are best for them. Competent loan officers and functional methods for measuring risk must be in place for this to be achievable. Decisions are made by every committee member at this point, making it extremely important. Here, default-prone borrowers are either rejected or asked to put up extra collateral to secure the loan, limiting the impact of default.

ii) Limitation

This strategy benefits the bank by lessening the loss brought on by a borrower. It avoids the scenario in which the counterparty's failure to fulfill his or her commitment negatively impacts the bank's financial performance. A modest amount of hazardous transactions are made (Gest el et al 2009).

iii) Diversification

Gestel et al. (2009) state that banks should conduct business with both individual and institutional counterparties. This lessens the impact of a loss by distributing the risk among several borrowers. For big, worldwide banks, it is considerably more doable.

iv) Credit enhancement

According to Gestel et al. (2009), a bank overcomes the problem by buying an insurance policy to cover any potential losses when it realizes that working with a certain type of borrower exposes it to undue risk. The process of raising the standard of the lending facility is referred to as credit risk mitigation.

v) Compliance to Basel Accord

The Basel Committee expands the banking techniques available to banks for managing their exposure to credit risk. One of the guiding principles is to periodically evaluate and modify their credit risk measures to reflect the state of the economy in the country. New products and services can be introduced to achieve this. Second, banks need to thoroughly scrutinize their clients. The consumer they are working with will be better understood as a result (Basel Committee on Banking Supervision, 1999). These tactics can lower the amount of credit risk the bank is exposed to, but they can not completely prevent credit risk. And this will improve the bank's profitability results.

2.1.10 Profitability of commercial bank

In the banking sector, profitability refers to a bank's capacity to produce profits relative to its outlays and incurred costs over a given time frame. It demonstrates the bank's ability to manage associated risk while raising capital. Additionally, it shows how well management is performing and how fiercely banks compete. A few metrics used to assess a bank's profitability include return on capital employed, return on asset, return on equity, net profit margin, cost of income ratio, and net interest margin. Other metrics include

risk-adjusted return on capital, price-earnings ratio, total share return, return on invested equity, and cash flow to assets. The key indicators of bank profitability, according to Brealey (2012), should be return on assets (ROA), return on equity (ROE), and net profit margin.

As one of the main objectives of commercial banks is to raise their profitability, profitability is a crucial aspect for commercial banks (Duffie, 2012). Every action a bank takes seems to have an impact on its profitability, either directly or indirectly. In the literature, there are various categories to evaluate bank profitability. Internal and external determinants can be roughly divided into these two divisions, nevertheless, according to Staikouras (2011). Decisions made by the bank management and the management-controlled policy objectives have an impact on internal determinants. It displays the sources and uses of capital within the bank as well as the control over expenses and liquidity. External determinants are variables outside the bank that are out of management's control. However, because the primary goal of this study is to analyze how credit risk management affects a bank's profitability, it will mostly concentrate on internal factors. However, some credit-related variables, such as the total number of non-performing loans, are outside bank management's control. A few external factors are also included in the model design because some management decisions are also influenced by outside rules.

2.1.10.1 Determinants of Profitability of Commercial Banks

The elements that affect a bank's performance can be divided into macroeconomic (external) and bank-specific (internal) components. These stochastic variables control the outcome. Internal factors are unique qualities of the bank that have an impact on its performance. Internal decisions made by management and the board have a significant impact on these variables. The external factors are those that affect the profitability of banks on a national or even sectoral level and are out of the company's control.

Non- performing Loan

The non-productive assets of banks are known as non-performing loans, or NPLs. In other words, the debt that isn't paid back on time is a loan or other problematic and dubious obligations. Nonperforming loans are often those that are not repaid within three months. Even if the debtor has not yet made up all of the missed payments, the loan will

become performing if the debtor resumes making payments on it. In order to get rid of risky assets and improve their balance sheets, institutions that have non-performing loans in their portfolios may decide to sell them to other investors. Sales on non-performing loans must be carefully considered since they can have numerous financial implications, including affecting the company's profit and loss, and tax situations (Dahal, 2002).

Capital adequacy ratio

One of the bank-specific characteristics that affects the degree of bank profitability is capital. Capital is the amount of own funds that are available to support the bank's operations and serve as a safety net in case of adversity. Deposits are the most fragile and susceptible to bank runs, hence bank capital generates liquidity for the bank. In addition, lower bank capital lowers the likelihood of trouble. The poor demand it creates for liabilities, the least expensive kinds of funding, is not without disadvantages though. The amount of capital that banks must have in order to be able to resist risks including credit, market, and operational risks they are exposed to in order to absorb potential losses and safeguard the bank's debtors is known as capital adequacy. The capital adequacy ratio demonstrates the bank's internal resilience to losses during a crisis. The bank's resistance to crises is directly correlated with its capital adequacy ratio. Additionally, it directly affects how profitable banks are (Dahal, 2002).

Loan and advance to deposit ratio

Banks offer loans and advances that can be established in accordance with the flexibility of business operations. Traders can use the cash credit, bank overdraft, and bill discounting facilities to borrow money for their daily financial needs. According to the borrower's convenience, the loan amount may be repaid in a short length of time. The working capital requirements are used to pay for current liabilities, employee wages and salaries, and the business's tax liability, allowing for the efficient operation of a business with borrowed cash from banks to finance its loan and advances. Loan and advances from banks are found to be economical for traders and businessmen, because banks charge a reasonable rate of interest on such loans/advances (Dahal, 2002).

Loan loss Provision ratio

The bank's forecast of potential loan losses is reflected in the loan loss provisions. It is a contra income account that enables banks to account for the anticipated loss from a

certain loan portfolio in their profit and loss statement. Through the capital adequacy reserve and the loan loss provision reserve, depositors are protected from both unexpected loss and anticipated loss. The fundamental premise of LLP is that bank managers reflect their perception of the quality of the bank's assets. The quality of the assets will decline as the loan loss provision amount rises and vice versa (Dahal, 2002).

2.1.11 Du Pont analysis

The DuPont analysis, often referred to as the DuPont identity, DuPont equation, DuPont framework, DuPont model, or DuPont technique, is a methodology for financial analysis that divides return on assets, or ROA, into its component parts.

This "decomposition" of ROA enables management to concentrate separately on the important financial performance parameters and so identify the company's strengths and shortcomings that need to be addressed. Investors can also compare the operational effectiveness of two similar companies.

The DuPont firm, which started employing this recipe in the 1920s, gave it its name. The formula was created by Donaldson Brown, a salesman for DuPont explosives, in a 1912 internal efficiency report.

Many businesses now assess how well assets are used using the return on assets (ROA) ratio that DuPont created for its own usage. It calculates the effects of asset turnover and profit margins taken together.

$$\text{ROA} = \frac{\text{Net Income}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average Total Assets}} = \frac{\text{Net income}}{\text{Average Total Assets}}$$

2.2. Review of articles and journals

Recent research has focused on the connection between credit risk management and its impact on profitability in both developed and developing countries. The review mainly concentrated on research related to the analysis of credit risk management and its impact on the performance or profitability of the bank in the context of various nations. This study is focused on credit risk management in banking. Authors that have looked into the factors and methodology employed in their empirical investigation of the variables and link between credit risk management and bank profitability.

Poudel (2018) aimed at investigating the effect of credit risk on Nepal's commercial banks' profits. The study used the one-way Fixed Effect Model (FEM) of panel data analysis. According to the study, whereas solvency ratio, interest spread rate, and inflation have negligible negative effects on profitability; credit risk has a large adverse effect. The factors that have the biggest beneficial effects on profitability are the capital-to-asset ratio, total assets, and GDP expansion.

Kishori and Sheeba (2017) aimed at investigating various researching the factors that affect credit risk as well as how credit risk affects the bank's profitability. The secondary data came from the State Bank of India's annual reports from 1996–1997 to 2015–2016, which span a 20-year period. In order to analyze the data, several regressions were used. The outcome demonstrated that profitability is significantly negatively impacted by credit risk. Moreover, due to ineffective credit risk management, State Bank of India has been exposed to credit risk. Improvements to credit risk management procedures were therefore advised. The State Bank of India can reduce credit risk by managing leverage effectively and reducing non-performing assets.

Malla (2017) has analyzed Credit Portfolio Management in Nepalese Commercial Banks aiming to know loan portfolio management of Nepalese BAFIA, to examine the effect of the loan portfolio management in bank's performance and also to examine the factors influencing loan portfolio management using both qualitative and quantitative methods. This study found that selected commercial banks have managed their loan portfolio as per the standard parameter of NRB directives 2073.

Ebenezer and Omar (2016) investigated the effect of credit risk on profitability of commercial banks in Nigeria. From the years 2011 to 2014, a total of 8 commercial banks were chosen for the investigation. The primary instrument for the data analysis was a panel data analysis. The findings showed a negative and significant correlation between the non-performing loan ratio and profitability, a negative and insignificant correlation between the debt-to-total-assets ratio and profitability, and a positive and insignificant correlation between the debt-to-equity ratio and profitability of banks during the study period.

Gizaw (2015) has examined the impact of credit risk on profitability performance of commercial banks in Ethiopia using descriptive statistics and panel data regression model.

The results showed that credit risk measures: non-performing loan, loan loss provision and capital adequacy have significant impact on profitability performance.

Alshatti (2015) has examined the effect of credit risk management on financial performance of the Jordanian commercial banks during the period 2005-2013 using capital adequacy ratio, credit interest/credit facilities ratio, provision for facilities loss/ net facilities ratio, leverage ratio and non-performing loans/gross loans ratio as independent variables. The measurable profitability by ROA and ROE is represented by the dependent variables. The author draws the conclusion that the financial performance of the Jordanian commercial banks is significantly impacted by all of the credit risk management indicators included in the study.

Bhattarai (2014) examined the impact of credit risk on the performance of Nepalese commercial banks utilizing combined information from 14 of those banks from 2010 to 2015, totaling 77 observations. The 77 observations comprise the following variables: bank size, return on assets, capital adequacy ratio, non-performing loan ratio, cost per loan assets, cash reserve ratio, and cost per loan assets. Data analysis was done using regression analysis. The study's conclusions demonstrated that the commercial banks under examination had subpar credit risk management procedures. This was further supported by the fact that the cost per loan asset had a favorable impact on bank performance while the non-performing loan ratio had a negative impact. The author discovered that the capital adequacy ratio and cash reserve have no impact on bank performance, in contrast to prior studies. The author advises banks to implement effective credit risk management strategies by completing good credit evaluation procedures before giving loans to consumers because there is a considerable correlation between credit risk and bank performance.

Kaaya (2013) has analyzed the relationship between credit risk and bank performance of commercial banks in Tanzania with an objective to examine the relationship between credit risk and bank performance. Regression analysis was main tool for data analysis. The overall findings of this study showed that credit risk indicators used in this study have a negative correlation with bank performance.

Haneef et al. (2012) conducted an empirical study in Pakistan, which was published in the International Journal of Business and Social Science by the Centre for Promoting Ideas in the United States. In this study, the researchers looked at how risk management affected

non-performing loans and profitability in Pakistan's banking industry. The study made extensive use of secondary data. In this study, the authors argued that Pakistan's banking sector lacked effective risk management practices. They came to the conclusion that poor risk management was to blame for the rise in non-performing loans, which threatened bank profitability. They recommended that the banking industry adopt the strategies put forward by the State Bank of Pakistan to prevent nonperforming loans. One of the study's biggest flaws was that its authors neglected to provide any empirical support for their findings.

Poudel (2012) tried to look into a number of credit risk management issues that affect how banks make money. The study examined variables such the capital-to-loan asset ratio, the cost per loan asset, and the default rate. Financial records from 31 banks were utilized to examine the data over an eleven-year period (2001–2011), comparing the profitability ratio to the default rate, cost of each loan asset, and capital adequacy ratio. The results were given in descriptive, correlational, and regression formats. The study found that each of these variables had a negative correlation with bank financial performance; however, the default rate was found to be the most accurate predictor of bank financial performance. It is advised that banks develop and put into action solutions that would both lessen their exposure to credit risk and boost their profitability.

Maerinskienė, Ivaškevičiūtė, & Railienė (2014) Lithuanian researchers conducted their research. They determined that the root reasons of the most recent financial crisis not only point to systemic or structural imbalances, but also to the necessity of upholding and strengthening the principles of credit risk management. They also learned that there are four main categories into which the recent financial crisis may be divided: Excessive borrowing by financial institutions and the private sector, financial disequilibria and asset price bubbles, information asymmetry and lack of transparency, global imbalances (current account), excessive elasticity in the international monetary and financial system, labor supply shock Low bank capital, an inadequate amount of liquid assets, a departure from the principles of credit risk management; c) regulatory: fragmented regulation/inadequate supervision, a regulator's inability to keep up with changes in the financial industry, a lack of systemic risk legislation. Rating agencies and financial instrument issuers are in conflict of interest; d) Behavioral: Short-term and excessive risk-taking incentives skewed system of rewards, Communicational and human/cultural shortcomings. They suggested that the first step in improving credit risk management is to

adhere to and integrate credit risk management principles into strategic management and daily operations. They also suggested emphasizing the value of liquidity, enhancing risk cultures, managing risk levels, redesigning compensation plans, strengthening internal controls, and learning from experiences outside the financial services industry.

Lalon (2015) conducted research in Bangladesh and published his findings in the International Journal of Economics, Finance, and Management Sciences. The researcher covered the theoretical underpinnings, significance, procedure, advantages, and difficulties of CRM in this study. Additionally, he asserts that CRM performance and usage. Finally, he looks into the relationship between bank profitability and CRM performance. The researcher gathered secondary data and used MS Excel and SPSS tools to examine it. The results of this study suggest that managing credit risk include identifying, measuring, matching mitigations, keeping an eye on, and controlling credit risk hotspots. According to the study's findings, CRM practices and banks' profitability (ROA) are positively correlated. This proved that Credit Risk Management may boost banks' profits when it is effective and efficient. His research indicates that employee motivation and increased training expenditures are the two biggest obstacles to CRM practices. He thought that a section dedicated to credit risk management would improve credit risk management procedures, guarantee the speedy recovery of classified debts, and increase bank profitability.

Han (2015) emphasized that credit risk has always been the primary risk of the banking industry, and it is also the primary object and core content of financial institutions and regulatory departments to prevent and control. Domestic commercial banks will be more susceptible to domestic and foreign factors as the global financial industry continues to develop, increasing their exposure to both internal and external risk. Therefore, there is theoretical as well as practical significance in research on commercial bank credit risk prevention. This study looks at the causes of credit risk in Chinese commercial banks, assesses their credit management practices and shortcomings, and suggests some remedial actions to manage credit risk in Chinese commercial banks under the changing circumstances.

Bhattarai (2015) examined the effect of credit risk on performance of Nepalese commercial banks. For the study, descriptive and causal comparative research designs were used. From 2010 to 2015, the regression model was utilized to examine the combined data of 14 commercial banks. According to the regression analysis, the "cost

per loan asset" has a favorable impact on bank performance while the "non-performing loan ratio" has a negative impact. Indicators of credit risk as well as bank size have a favorable impact on bank performance. Both the cash reserve and the capital adequacy ratio are not thought to have an impact on a bank's performance. The results of this study indicate that there is a strong correlation between bank performance and credit risk indicators.

Ahemed & Malik (2015) conducted empirical study in Pakistan and it was published in the International Journal of Economics and Financial Issues. The impact of credit risk management (CRM) techniques on loan performance (LP) in Pakistan's microfinance banking sector was the main subject of this study. For this study, the researchers obtained information from top-level, middle-level, and lower-level managers. He employed a variety of variables, including: a) Loan Performance (LP), which is a dependent variable and actually stands in for CRM; and b) four independent variables, including Credit Terms (CTP), Client Appraisal (LCA), Collection Policy (CP), and Credit Risk Control (CRC). He also performed statistical analyses of the data using descriptive and inferential methods. The study's findings showed that, at a 1% significant level, the credit conditions and client appraisal have a positive and significant impact on the LP, whereas the CP and CRC have a positive but minor impact. The researcher intended that by focusing on the explanatory variables of credit conditions and client evaluation, the study's findings would aid management in properly managing credit risk and improving loan performance.

Kodithuwakku (2015) conducted empirical study in Sri Lanka and it was published in the International Journal of Scientific Research and Innovative Technology. In this study, the authors concentrated on the effect of credit risk management on the operation of commercial banks. Panel data was gathered from 2009 to 2013 from primary and secondary sources from banks that were chosen for their high performance and data accessibility. Loan Provision to Total (LP/TL), Loan Provision to Non-Performing Loans (LP/NPL), Loan Provision to Total Assets (LP/TA), and Non-Performing Loans/ Total Loans (NPL/TL) all credit risk indicators—were the independent variables. The dependent variable (performance indicator) utilized in the analysis was called ROA (Return on Assets). Empirical evidence suggested that non-performing loans and provisions significantly impacted profitability. As a result, the study encouraged banks to implement effective tools and techniques for credit risk management.

Kipngetich and Muturi (2015) conducted an empirical study in Kenya, and their findings were published in the Strategic Journal of Business and Change Management. The study's main focus was on how credit risk management affected the financial performance of savings and credit cooperative societies. Capital sufficiency and managerial effectiveness were employed as two independent factors, and financial performance was used as one dependent variable. They evaluated the outcomes utilizing secondary source data and a cross-sectional descriptive research approach. To evaluate the data and build a regression model, they employed the SPSS application. A favorable and statistically significant association between capital adequacy, management effectiveness, and financial performance was found in the empirical research. This showed that greater capital sufficiency and managerial effectiveness result in greater profitability.

Veizi (2015) found banks are defined as financial intermediation institutions because they receive and manage various risks. Among the numerous banking risks, most researchers identify credit risk as the most significant risk affecting bank performance. On the other hand, the banking industry's profitability has drawn a lot of attention in recent years. This essay aims to introduce readers to the theoretical and empirical literature on the connection between credit management risk and banking profitability metrics. The majority of these research have come to the conclusion that the main driver of commercial bank profitability is credit risk management. Studies, however, indicate that there is little effect of credit risk management on banks profitability.

Siekelova, Kollar and Weissova (2015) explained the Credit risk management was not so necessary, while sales of deferred payment has begun to dominate the prompt payment. The existence of receivables has become a necessity in the area of functional and effective market economy. The majority of the company's receivables are in the form of trade credit. Credit management has therefore become crucial in managing trade credit. Four out of every ten businesses in the Slovak Republic go bankrupt because of the failure to pay their receivables on time or at all. During the course of their daily duties, credit managers deal with a number of crucial issues, including: the level of indebtedness enterprises have incurred as a result of the sale of invoices; whether or not the increase in debt should be supported; whether or not customers are able and willing to fulfill their obligations in a proper and timely manner; whether it is necessary to decide whether or not to use an efficient tool for debt recovery. The article emphasizes the relationship between a company's volume of receivables and its solvency and emphasizes the

significance of credit management and its key functions. We'll employ formal logical techniques like analysis, synthesis, and interpretation. The goal is to develop fundamental theoretical guidelines for calculating each customer's credit limit within the business.

Alshatti (2019) explained the effect of credit risk management on financial performance of the Jordanian commercial banks during the period (2005-2013), thirteen commercial banks have been chosen to express on the whole Jordanian commercial banks. The relationship between credit risk management and the financial performance of Jordanian commercial banks as assessed by ROA and ROE was quantified using two mathematical models. The study also comes to the conclusion that the financial performance of Jordanian commercial banks is significantly impacted by the credit risk management indicators looked at in this study. The study proposes that banks enhance their credit risk management in order to boost revenues in light of the findings. The indicators of non-performing loans/gross loans, provision for facility loss/net facilities, and leverage ratio, which were shown to be important in assessing credit risk management, should be taken into account by banks.

Additionally, banks should establish adequate credit risk management policies by imposing strict credit estimation before granting loans to clients. Additionally, banks should design an effective credit risk management system by creating a suitable credit risk environment, operating under a sound credit granting process, maintaining an appropriate credit administration that includes monitoring, processing, and enough controls over credit risk, and banks should put it in right way.

Bhattarai (2020) investigated the effect of credit risk on the financial performance of commercial banks in Nepal. 160 observations from ten commercial banks' balance panels covering the years 2001 to 2016 were used for the analysis. The results of the regression analysis showed that the financial performance (ROA) of commercial banks in Nepal is significantly influenced by their capital adequacy ratio (CAR), non-performing loan ratio (NPLR), and management quality ratio (MQR). Similarly, neither the credit to deposit ratio (CDR) nor risk sensitivity (RS) significantly affect the financial performance of Nepal's commercial banks.

Chhetri (2021) examined the effect of credit risk on the financial performance of commercial banks in Nepal. 85 observations from panel data from seventeen commercial banks were examined between 2015 and 2020. Non-performing loans (NPLR) have a

detrimental and statistically significant influence on financial performance (ROA), according to the regression model. Financial performance (ROA) is negatively and statistically insignificantly impacted by both the capital adequacy ratio (CAR) and bank size (BS). The study found that management quality ratio (MQR) has a positive and statistically significant association with financial performance (ROA) of commercial banks in Nepal. Credit to deposit (CDR) has a positive but not statistically significant relationship with financial performance (ROA). In order to protect their assets to the greatest extent possible, Nepalese commercial banks are advised to practice scientific credit risk management, enhance the effectiveness of their credit analysis, and manage their loans more effectively. This will help to reduce the high incidence of non-performing loans and their detrimental effects on financial performance.

Butola, Dube & Jain (2022) conducted the study is to find a statistical association between credit risk management (CRM) and profitability within Indian banks. For the years 2005 through 2019, secondary data from 38 Indian scheduled commercial banks were gathered and subjected to a panel data regression analysis. For the purposes of this study, the following variables are considered independent: credit to deposit ratio (CDR), net interest margin (NIM), operating profits to total assets (OPA), capital adequacy ratio (CAR), provision coverage ratio (PCR), and net non-performing assets to net advances (NNPA). These variables are regarded as the determinants of CRM. An indicator of profitability and a dependent variable, return on assets (ROA) is. Statistics demonstrate that CDR, OPA, and CAR are all favorably correlated with profit rate (ROA), while NIM, NNPA, and PCR are all shown to be negatively correlated with profit rate (ROA) and statistically show a significant association with the exception of PCR.

2.3. Review of the thesis

Although multiple studies have made admirable efforts to evaluate the risk management procedures used by various banks in Nepal and overseas, no study akin to this has been done especially on the credit risk procedures used by banks in Nepal. The credit risk management techniques of commercial banks in Nepal have a substantial impact on the scope and objectives of the current study, despite the fact that none of the studies exactly fit inside the framework of this study, according to a review of the literature on the topic.

Awoke (2014) has conducted the general objective of the study to measure the impact of credit risk on the financial performance of Banks. The following are the study's key

findings. The ratio of provision to total loans (PRTL), a variable in the regression model that reflects the degree of credit risk, has a negative impact on profitability. Additionally, the variable plays a crucial role in illuminating how credit risk affects the return on assets for commercial banks in Ethiopia. The variable is utilized in the model to contrast the effect of provisional costs on bank profitability in comparison to non-provisional costs. Surprisingly, this factor seems to have a considerable effect on the performance of banks. Studies on the provision to loans ratio, loan to total asset ratio, cost to total loans ratio, and natural logarithm of total assets all have a big impact on how well a bank performs. However, a certain variation in the magnitude and direction of their effect on the selected profitability measure, Return on Asset. .

Rai (2019) has conducted study about a part of credit risk associated with those banks. The study's goal was to examine and analyze how the selected banks have managed credit risk in Nepal's competitive banking industry. The main conclusions drawn from these investigations are listed below. It has been observed that commercial bank advances and loans are gradually rising as interest rates decline. The loan to deposit ratio is a measure of how effectively resources are used, and it helps determine appropriate interest rate structures. Since the interest rate structures of most banks are comparable, interest rate liberalization is not as important. In his thesis, he advocated the following. Interest rates' significance in lending. the effects of banking deregulation, notably on interest rates, on bank performance.

Shrestha (2020) examined the impact of credit risk management on the profitability of Nepalese commercial banks. Four commercial banks' financial statements from 2010 to 2017 were used for analysis. The profitability of Nepalese commercial banks was evaluated using the non-performing loans ratio and credit risk management, while return on equity (ROE) and return on asset (ROA) were employed as profitability indicators. Four commercial banks' financial statements from 2010 to 2017 were used for analysis. While non-performing loans ratio (NPLR) and capital adequacy ratio (CAR) were employed as credit risk management indicators, return on equity (ROE) and return on asset (ROA) were utilized as profitability indicators. The results show a strong positive correlation between non-performing loans and commercial banks' profitability, showing that even when there are more loan losses, banks are still profitable. Small businesses are unable to receive loans because of the higher interest margin that banks charge on their

loans as a result of poor credit risk management procedures. The commercial banks of Nepal have managed superfluous expense areas in terms of policy directions.

Bhattarai (2022) analyzed the impact of credit risk on the performance of Nepalese commercial banks using aggregated data from 14 of those banks from 2015 to 2020, totaling 80 observations. The 80 observations comprise bank size as an independent variable; capital adequacy ratio, non-performing loan ratio, cost per loan assets, cash reserve ratio, and return on assets as a dependent variable. Data analysis was done using regression analysis. The study's conclusions demonstrated that the commercial bank under review had insufficient credit risk management procedures. This was further supported by the fact that the cost per loan asset had a favorable impact on bank performance while the nonperforming loan ratio had a negative impact. In contrast to findings from earlier research, the author found that the capital adequacy ratio and cash reserve have no effect on bank performance. Since there is a strong correlation between credit risk and bank performance, the author advises banks to implement solid credit risk management techniques by carrying out thorough credit evaluations prior to making loans to clients.

2.4. Research gap

A number of tasks are carried out by banks and financial institutions for the management of credit risk, including market research, periodic credit calls, periodic plant visits, building MIS, risk scoring, and annual account reviews. There is always a chance that the borrower would break their agreements for one reason or another, increasing the bank's credit risk. These losses may take the form of a complete default or losses from changes in portfolio value brought on by a real or perceived decline in credit quality that is less severe than default (Chhetri, 2021).

The study of the major credit risk indicators of banks, including the Capital Adequacy Ratio (CAR), Non-Performing Loan Ratio (NPLR), Credit to Deposit Ratio (CDR), and Management Quality Ratio (MQR), and whether or not they have a direct impact on profitability is the focus of this researcher's work, as opposed to a review of the relevant literature (Bhattarai, 2019); (Bhatta, 2017), etc. There hasn't been a research that outlines how credit risk is now structured in the banking sector of Nepal, along with the current tactics commercial banks there employ to manage, mitigate, and reduce credit risk (Pandey, 2005).

The study conducted by (Lalon, (2015); (Pandey, 2005); (Bhatta, 2017) etc. have used descriptive research design only but this study had used descriptive as well as correlational research design.

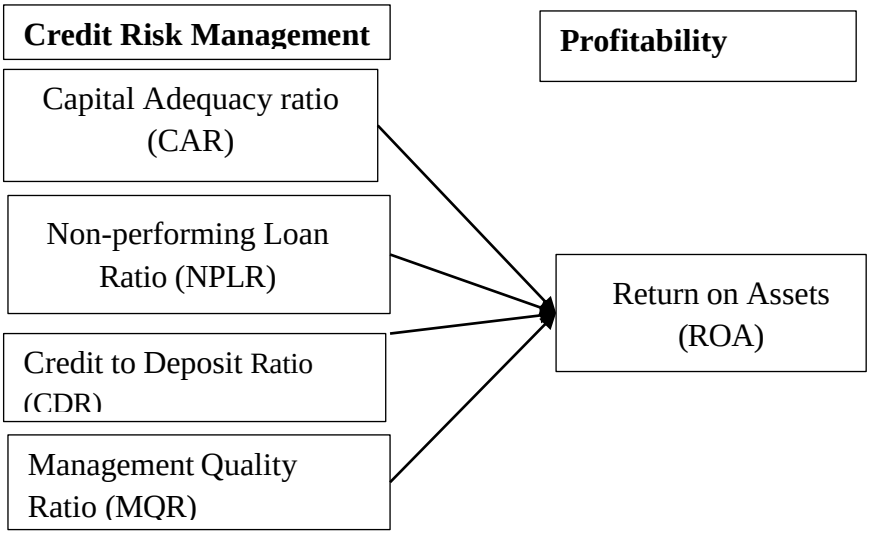
In the research study researcher has used different sample than (Bhattarai, 2015), (Adhikari, 2011) which makes this study different.

2.5. Conceptual framework and variables definitions

The purpose of this conceptual framework is to aid commercial banks in comprehending how credit risk management affects their financial performance. According to theory and major empirical evidence, commercial banks' financial performance may be influenced by the Capital Adequacy Ratio (CAR), Non-performing Loan Ratio (NPLR), Credit to Deposit Ratio (CDR), and Management Quality Ratio (MQR) (MQR). Figure 2.1 depicts the theoretical framework developed in this study to test the effect of independent variables on the profitability of Nepalese commercial banks.

Figure 2.1

Conceptual framework



Source: *Siekelova & Boris (2015). Impact of credit risk management. procedia Economic & Finance, 4(2), 410-425.*

The above framework shows CAR, NPLA, CDR and MQR as independent variable to measure the impact on Return on Assets. ROA is used as the dependent variable.

Variables definition:

For this research, the study variables are defined as follows;

A) Return on assets (ROA)

The return on assets (ROA) indicator shows how well bank management utilises the bank's real investment resources to produce profits. It measures the profit made per dollar of assets. ROA is a helpful measure for assessing bank profitability for banks with comparable business risk profiles since it prevents distortions brought about by variations in financial leverage. From an accounting standpoint, return on assets (ROA) is a thorough measure of a bank's entire performance. Compared to other performance metrics, it seems more appropriate for comparing banks in the same industry. As a result, return on assets (ROA) is the performance metric selected for this study. It demonstrates the efficiency with which management uses a commercial bank's assets. Since it eliminates distortions brought on by variations in financial leverage, ROA is a helpful indicator for evaluating bank profitability for banks with similar risk profiles.

B) Credit risk management indicators

On the basis of how crucial it is to control credit risk, more credit risk management indicator variables were selected for the study. The significance of the earlier studies is used to select some of the indicators.

Capital adequacy ratio (CAR)

In order to absorb future losses and safeguard the debt holders of the financial institution, capital adequacy is the capital that is anticipated to maintain pace with the risk exposures of the financial institution, such as credit risk, market risk, and operational risk. Another independent variable, the capital adequacy ratio (CAR), was chosen because it is the regulator's primary indicator of a bank's financial health. The most dependable and liquid forms of financial capital, namely shareholders' equity, are included in the capital adequacy ratio. Profitable banks have high capital adequacy ratios. Due to their strong capital requirements, commercial banks are able to absorb problematic loans (Abiola & Olausi, 2014). In addition to these benefits, a bank with adequate capital is able to absorb potential loan losses, avoiding bank run, insolvency, and failure.

A bank's capital quantity is expressed as a proportion of its risk-weighted exposure via the capital adequacy ratio. It is primarily composed of shareholder equity, one of the most

dependable forms of financial capital. Theoretically, profitable banks should have a high capital adequacy ratio. In addition to being able to absorb potential loan losses, a bank with sufficient capital can avoid bank runs, insolvency, and failure (Bhattarai, 2016).

Non- Performing loans ratio (NPLR)

Frost (2004) asserts that non-performing loan ratios (NPLR), which serve as a proxy for asset quality, and the allowance or provision for loan losses reserve, are key asset quality indicators. The standard classification system divides loans into five categories: standard, special mention, substandard, dubious, and loss. Poor asset quality is the primary factor in the majority of bank failures, according to Grier (2007). The danger of loan losses brought on by unpaid loans is the biggest threat a bank faces (Chowdhury, 2013). The relationship between the volume of non-performing loans and the total number of loans is directly represented by the NPL to Total Loans Ratio. It indicates how many loans in the portfolio are non-performing. A lower ratio indicates that the loan portfolio is of higher quality.

According to Karki (2011) and Kodithuwakku (2015), non-performing loans have a detrimental effect on profitability. The majority of commercial banks' profits, however, are unaffected by the volume of non-performing loans, according to Kithinji (2010). A negative correlation between non-performing loans and bank performance is predicted by theory and the majority of empirical research, notwithstanding some contradictory findings. NPLs have a detrimental and statistically significant influence on the financial performance of commercial banks in Nepal (Bhattarai, 2016). The non-performing loans ratio serves as a gauge of how well the bank manages credit risk and represents the bank's credit quality. The NPLR in particular shows how commercial banks manage credit risk in Nepal because it specifies the percentage of non-performing loans in relation to total loans.

Credit to deposit ratio (CDR)

A crucial instrument for evaluating a bank's liquidity is the credit to deposit ratio (CDR), which compares the amount of money used for credit to the total amount of deposits received. The bank is better at using the money it has raised when the CDR is greater (Jha & Hui, 2012). This ratio evaluates the management's capacity to lend money while using assets profitably (Ibrahim, 2014). This ratio demonstrates the connection between the total amounts of deposits the bank has received and the loans and advances it has

provided. A high ratio suggests that the deposit that has been collected is being mobilized more successfully, and vice versa. It is important to remember that a high ratio cannot be better for liquidity. This ratio is calculated dividing loan and advances by total deposits.

Management quality ratio (MQR)

The board of directors' ability to govern the bank's resources in order to advance the interests of its shareholders is expressed through the qualitative variable known as management soundness. It is calculated using the ratio of total operational income to total assets.

Table 2.2

Measurement of dependent and independent variables

Variables	Measurement
CAR	Capital adequacy ratio (CAR) is the proportion of a bank's own Equity in relation to its risk exposures.
CDR	The credit to deposit ratio is the ratio of total loans to total deposits. This ratio assesses the management's ability to use assets to make loans, resulting in high profitability.
NPLR	Non-Performing loan ratio (NPLR) is the percentage of non-Performing loans to total loans and advances.
MQR	Total Operating income to total Assets as a measure of Management quality.
ROA	Return on Assets (ROA) is the ratio of a bank's net profits to total assets.

2.6. Research Hypothesis

For this study following hypotheses are formulated.

H1: There is positive impact of capital adequacy ratio (CAR) on profitability.

H2: There is positive impact of Non-performing loan ratio (NPLR) on profitability.

H3: There is positive impact of credit to deposit ratio (CDR) on profitability.

H4: There is positive impact of management quality ratio (MQR) on profitability.

CHAPTER –III

RESEARCH METHODOLOGY

The methodologies for evaluating the connection between credit risk management and commercial banks' profitability are covered in this chapter. It entails using particular methods for data collection and analysis during the research process. It describes the methods and apparatus utilized to compile pertinent data for a particular research project. This chapter covers a study framework that includes the research design, sample size, data gathering process, and tools and procedures for data processing.

3.1. Research design

This study based on the descriptive and correlational research design to assess the relationship between independent variables and dependent variables. Descriptive research design is used to explain fundamental characteristics of variables. Correlational research design is employed to investigate the relationship between credit risk management and profitability.

3.2. Population and sample

There are twenty commercial banks as total population, which is licensed by Nepal Rastra Bank (Mid July, 2023). Regarding the previous thesis, the previous researcher has taken three or five as the sample size. So out of 20 commercial banks, five commercial banks have been selected as sample. The selected banks are:

Table 3.1

Sample banks

S.N.	Sample Banks
1	Siddhartha Bank Limited(SBL)
2	Rastriya Banijya Bank (RBBL)
3	Himalayan Bank Limited (HBL)
4	NIC ASIA Bank Limited (NICA)
5	Nabil Bank Limited (NABIL)

Adhikari, (2020); Joshi, (2018); Chand, (2016) etc. has taken same sample size as taken

in this study for same size of population. Above five sample commercial banks have good organizational performance (Profitability) also, so these samples can represents the whole population. So, five sample size for ten population is sufficient.

3.3. Source of data

The secondary data used in this study is taken from public sources. Data for the fiscal years 2072–2073 through 2078–2079 have been gathered from the Nepal Rastra Bank website and the audited annual report of a sample bank. There are just five commercial banks in the research.

3.4. Collection of data

This study's data came from secondary sources. The information was gathered from the commercial banks' annual reports, which were available online.

3.5. Data analysis tools and techniques

Financial and statistical approaches have been used to evaluate the effect of credit risk management on profitability. The computation and analysis of data have been performed using SPSS and Microsoft Excel. Assessment of the effect of credit risk management on profitability has been done using the regression model.

3.5.1 Financial tools

Followings are the financial tools that will be used to achieve the purpose of the study.

Dependent variable

Profitability ratio

$$\textbf{Return on Assets (ROA)} = \frac{\textbf{Net Income}}{\textbf{Total Assets}}$$

Independent variables

Credit risk management indicator

$$\textbf{Non-performing loan ratio (NPLR)} = \frac{\textbf{Non performing Loan}}{\textbf{Total Loan}}$$

$$\textbf{Capital Adequacy Ratio} = \frac{\textbf{Total Capital}}{\textbf{Risk weighted Assets}}$$

$$\textbf{Credit to Deposit Ratio (CDR)} = \frac{\textbf{Total credit}}{\textbf{Total deposit}}$$

$$\textbf{Management quality ratio (MQR)} = \frac{\textbf{Total operating income}}{\textbf{Total assets}}$$

3.5.2. Statistical tools

i) Arithmetic mean

The arithmetic mean is the average of a group of numerical values determined by adding them all up and dividing by the number of terms in the group. Average is another name for a mean. The mathematical formula for the arithmetic mean is:

$$\text{Mean} = \frac{\sum X}{n}$$

Where,

X = Number in X-series

n = Number of observations in a sample

ii) Standard deviation

The positive square root of the arithmetic mean of the arithmetic mean of the squares of deviations of a given observation from their arithmetic mean is used to express standard deviation. It is represented by the Greek letter ". A low standard deviation denotes a high level of observational uniformity. Standard deviation is defined mathematically as:

$$\sigma = \sqrt{\frac{\sum (X - \overline{X})^2}{n}}$$

Where,

σ=Standard deviation

X =Number in X-series

$\overline{X}$=Mean

n=Number of observations in a sample

iii) Coefficient of variation

The other helpful risk indicator is the coefficient variation (CV). Risk per unit of return is calculated as the standard deviation divided by the expected return. When the predicted returns on two alternatives are not the same, it provides a more valid basis for comparison. The coefficient of variation is a concise explanation of the relative trade-off between expected return and risk if investors think that the rate of return should rise as risk rises.

$$CV = \frac{\sigma}{\bar{X}}$$

Where,

CV = Coefficient of Variation

$\bar{X}$ = Mean

σ = Standard Deviation

iv) Correlation coefficient

The degree of linear link between two or more variables that exists is known as correlation. When one variable changes in tandem with another, two variables are said to be correlated. A positive association is stated to exist if the average change in one variable's value is correlated with the average change in another variable's value. If the value of one variable decreases or increases while the value of another variable remains constant, the connection will be negative. However, the correlation coefficient consistently stays between +1 and -1. According to Karl Pearson, the straightforward correlation coefficient (between, say, X and Y) is calculated as follows:

$$r = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{N\sum X^2 - (\sum X)^2}\sqrt{N\sum Y^2 - (\sum Y)^2}}$$

Where,

r : Correlation between X and Y

n : Number of observations in series X and Y

$\sum X$: Sum of observations in series X

$\sum Y$: Sum of observations in series Y

$\sum X^2$: Sum of square observations in series X

$\sum Y^2$: Sum of squared observations in series Y

$\sum XY$: Sum of product of observations in series X and Y

v) Regression model analysis

To estimate the unknown values of a dependent variable, two or more independent variables are used instead of a single independent variable. A statistical technique called multiple regression uses the known values of two or more independent variables to estimate (or predict) the value of a dependent variable that is most likely to occur. We look at the multiple regression equation below.

Multiple Regression Model

$ROA = \beta 0 + \beta 1CAR + \beta 2NPLR + \beta 3CDR + \beta 4MQR + ei.$

Where,

ROA = Return on assets, (dependent variable)

CAR = Capital adequacy ratio

NPLR = Non-performing loan Ratio

CDR = Credit to deposit Ratio

MQR = Management quality Ratio

$\beta 0$ = Constant

βi = Beta Coefficient of slope of regression model and

ei = Error term

CHAPTER –IV

RESULTS AND DISCUSSION

This chapter summarizes the study's results and deals with how to present, analyze, and interpret the pertinent information from the gathered sample banks in order to achieve the study's goals. To get the best results, the data has been examined using the research procedures that are discussed in the third chapter.

The result is the end product of the data analysis. One technique to learn about a company's financial plans and policies is to use the financial indicators to evaluate their strengths and shortcomings. With the aid of these methods, it is possible to assess the state of the various aspects of credit risk management and how they affect the financial success of Nepalese commercial banks. The profitability of commercial banks is evaluated in this study using returns on assets.

4.1. Descriptive analysis of the study

To find out the present condition of CAR, CDR, NPLR, MQR and ROA following descriptive analysis has been conducted.

4.1.1. Analysis of capital adequacy ratio

Capital adequacy is the capital that is expected to maintain balance with the risks exposure of the financial institution, such as credit risk, market risk, and operational risk, in order to absorb potential losses and protect the debt holder of the financial institution. The choice of the capital adequacy ratio (CAR), another independent variable, was made because it is the main indicator of a bank's financial health in the eyes of regulators. Below is a list of sample commercial banks' capital adequacy ratios (CAR) for the research period.

Table 4.1

Capital Adequacy Ratio (CAR) of Sample commercial banks (In percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	12.89	10.40	20.39	13.79	12.65
2073/74	12.90	10.39	19.41	13.83	12.66
2074/75	13.10	11.46	20.33	12.24	13.26
2075/76	12.52	13.39	20.37	13.32	13.54
2076/77	13.18	11.64	19.18	13.50	14.72
2077/78	12.78	13.48	16.95	11.57	14.95
2078/79	12.77	13.46	16.95	12.55	15.96
Average	**12.85**	**12.30**	**19.45**	**19.50**	**14.30**
S.D.	**0.235**	**1.325**	**1.455**	**0.685**	**1.305**
C.V.	**0.020**	**0.185**	**0.075**	**0.049**	**0.095**

Source: Appendix A and Annual Reports of Respective Banks

Table 4.1 represents the capital adequacy ratio of sample banks for seven years of study period. The average ratio for capital adequacy is 12.85%, 12.30%, 19.45%, 13.07% and 14.30% for NABIL, RBB, HBL, NICA and SBL respectively. This indicates that the capital adequacy ratio for the bank is satisfactory because all sample banks have maintained CAR above as per NRB directives over the study period. Likewise, Standard deviation for the NABIL, RBB, HBL, NICA and SBL are 0.235, 1.325, 1.455, 0.685 and 1.305 respectively. The capital adequacy ratio for HBL, which is 19.45%, is higher than that of RBB, which is 12.30%, SBL, which averages 14.30%, and NABIL, which averages 12.85%, according to the seven years' analysis, which covers the fiscal years 2072/73 to 2078/79. The capital adequacy ratio for the sample banks also exhibits a trend of fluctuation. NABIL is more consistent than other sample banks, according to CV

research, having a lower CV of 1.8%. It demonstrates that every sample bank complies with NRB guidelines regarding the capital adequacy ratio.

4.1.2. Analysis of non- performing loan ratio

Ratio of non-performing loans to total loans and advances This study's ratio is one of its independent factors. All commercial banks must set up loan loss provisions for suspect and bad loans, according to a directive from the NRB. In their balance sheets or profit and loss accounts, the impacted banks have not, however, revealed information about non-performing loans. Using the sample banks' main indicator, the amount of non-performing assets as a proportion of all loans was computed. The non-recovery loan share of total loans is shown by this ratio.

Table 4.2

Non-performing Loan Ratio (NPLR) of Sample commercial banks (In percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	2.79	3.45	4.56	3.95	1.29
2073/74	2.80	3.44	4.60	4.00	1.36
2074/75	3.45	4.75	3.51	1.10	2.77
2075/76	4.74	4.59	3.29	23.00	2.93
2076/77	3.98	4.48	2.84	17.00	2.46
2077/78	2.85	3.25	1.78	24.10	1.49
2078/79	2.82	3.21	1.85	21.35	2.55
Average	**3.555**	**4.265**	**3.325**	**12.560**	**2.365**
S.D.	**0.8260**	**0.6525**	**0.9950**	**10.7542**	**0.7275**
C.V.	**0.2480**	**0.1575**	**0.3075**	**0.7565**	**0.3354**

Source: Appendix A and Annual Reports of Respective Banks

Table 4.2 shows the non-performing loan to total loan and advance over the seven-year study period. The average ratio Non-performing loan to total loan and advance is 3.555%, 4.265%, 3.325%, 12.560% and 2.365% for NABIL, RBB, HBL, NICA and SBL respectively. This indicates that the Non-performing loan to total loan and advance ratio for the bank is satisfactory besides NICA because it has average NPLR 12.560% which is more than NRB standard. Likewise, Standard deviation for the NABIL, RBB, HBL, NICA and SBL are 0.8260, 0.6525, 0.9950, 10.7542 and 0.7275 respectively. From the seven years' analysis i.e., fiscal year 2072/73 to 2078/79 credit to total deposit ratio is greater for NICA which is 12.560% than RBB with an average of 4.265%, NABIL with an average of 3.555% and HBL with an average of 3.325%. In same way, credit to deposit ratio for sample banks is fluctuating trend. RBB is more consistent than other sample banks having a lower CV, or 16.74%, according to CV analysis. Non-performing assets have a significant impact on the banking industry. This previous fact is not far from sample banks. The broader banking industry will be impacted if non-performing loans rise. As a result, earnings will drop and provision amount will rise. Therefore, it is advised that all of the sample banks extend loans honestly and implement efficient follow-up for the recovery of non-performing assets.

4.1.3. Analysis of credit to deposit ratio (CDR)

A crucial instrument for evaluating a bank's liquidity is the credit to deposit ratio (CDR), which compares the amount of money used for credit to the total amount of deposits received. The bank is better at using the money it has acquired when the CDR is greater. This ratio evaluates the management's capacity to lend money while using assets profitably. The credit to deposit ratio (CDR) of the sample commercial banks during the study period is displayed below.

Table 4.3

Credit to Deposit Ratio (CDR) of Sample commercial banks (In percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	64.62	68.52	91.35	82.48	73.95
2073/74	65.38	69.30	92.90	83.70	74.7
2074/75	82.65	72.38	95.65	86.32	71.80
2075/76	81.95	77.15	92.64	84.55	72.93
2076/77	79.73	67.16	85.84	85.75	75.12
2077/78	89.84	73.82	91.94	90.66	85.10
2078/79	89.93	76.35	92.34	90.36	85.95
Average	**80915**	**72.752**	**92.185**	**85.40**	**76.845**
S.D.	**8.9555**	**3.8940**	**3.7280**	**3.1107**	**5.3546**
C.V.	**0.1225**	**0.0543**	**0.0405**	**0.0650**	**0.0698**

Source: Appendix A and Annual Reports of Respective Banks

Table 4.3 shows the credit to total deposit over the seven-year study period, which shows the use of credit out of total deposit. The average ratio for credit to total deposit is 80915%, 72.752%, 92.185%, 85.40% and 76.845% for NABIL, RBB, HBL, NICA and SBL respectively. This indicates that the credit to deposit ratio for the bank is satisfactory. Likewise, Standard deviation for the NABIL, RBB, HBL, NICA and SBL are 8.9555, 3.8940, 3.7280, 3.1107 and 5.3546 respectively. From the seven years' analysis i.e., fiscal year 2072/73 to 2078/79 credit to total deposit ratio is greater for HBL which is 92.18% than NICA with an average of 85.40%, NABIL with an average of 80915% and SBL with an average of 75.92%. In same way, credit to deposit ratio for sample banks is fluctuating trend. CV analysis shows NICA is more consistent than other sample banks with a lower CV i.e., 3.60%.

4.1.4. Analysis of management quality ratio (MQR)

The analysis of the Management Quality Ratio (MQR), which is the most popular technique for managing credit risk in commercial banks, is one of the independent variables in this study. The board of directors' ability to govern the bank's resources in order to advance the interests of its shareholders is expressed through the qualitative variable known as management soundness. It is calculated using the ratio of total operational income to total assets.

Below is an analysis of the management quality ratio for a sample of commercial banks over the study period.

Table 4.4

Management Quality Ratio (MQR) of Sample commercial banks (In percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	3.26	2.80	2.65	3.62	3.59
2073/74	3.28	2.85	2.68	3.65	3.65
2074/75	4.67	3.64	3.55	2.56	2.89
2075/76	4.85	3.75	5.75	4.25	3.26
2076/77	4.65	4.34	4.65	5.44	4.12
2077/78	5.50	4.95	4.58	6.24	4.65
2078/79	5.48	4.99	4.55	6.53	4.50
Average	**4.805**	**3.824**	**4.252**	**4.422**	**3.725**
S.D.	**0.9954**	**0.7888**	**1.1680**	**1.4415**	**0.7123**
C.V.	**0.2060**	**0.2016**	**0.2755**	**0.3235**	**0.1855**

Source: Appendix A and Annual Reports of Respective Banks

Table 4.4 shows the operating income to total assets over the seven-year study period, which shows the management quality ratio. The average ratio for management quality

is 4.805%, 3.824%, 4.252%, 4.422% and 3.725% for NABIL, RBB, HBL, NICA and SBL respectively. This indicates that the management quality ratio for the bank is satisfactory. Likewise, Standard deviation for the NABIL, RBB, HBL, NICA and SBL are 0.9954, 0.7888, 1.1680, 1.4415 and 0.7123 respectively. From the seven years' analysis i.e., fiscal year 2072/73 to 2078/79 management quality ratio is greater for NABIL which is 4.805% than NICA with an average of 4.422%, HBL with an average of 4.252% and SBL with an average of 3.725%. In same way, management quality ratio for sample banks is fluctuating trend. CV analysis shows SBL is more consistent than other sample banks with a lower CV i.e., 18.94%.

4.1.5. Analysis of Profitability (ROA)

A crucial measure for determining a company's profitability is the Return on Assets (ROA) ratio. To evaluate the bank's operational effectiveness and earnings performance, it computes. In order for a bank to be able to pay operational costs and interest rates, it must be able to make a sufficient profit on every rupee invested. The profitability of the bank should also be assessed in terms of capital provided by creditors' contributions and asset investment. If the bank can't get a good return on its investment, its ability to survive is threatened.

This ratio is based on total assets and net income. This ratio is computed by dividing net income by the total assets of the company to see how effectively the assets of the company can increase profit. This ratio offers the framework required for a business to generate a good return on equity. The Table 4.5 shows the return on total assets ratio for sample commercial banks for the years 2072/73 to 2078/79.

Table 4.5

Return on Assets (ROA) of Sample commercial bank (in percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	1.89	1.05	1.95	2.56	1.68
2073/74	2.69	1.60	2.15	1.64	2.13
2074/75	2.62	1.42	2.72	0.98	1.80
2075/76	2.12	2.23	2.77	1.56	1.19
2076/77	1.58	1.65	1.86	1.32	1.56
2077/78	2.72	1.10	1.60	1.90	1.50
2078/79	1.90	1.25	1.56	1.15	1.46
Average	**2.15**	**1.60**	**2.25**	**1.35**	**1.65**
S.D.	**0.5156**	**0.4225**	**0.5285**	**0.2895**	**0.3562**
C.V.	**0.2264**	**0.2683**	**0.2439**	**0.2310**	**0.2106**

Source: Appendix A and Annual Reports of Respective Banks

Table 4.5 shows the result of net income to total assets ratio or return on assets of the sample banks. The average ratio for return on assets is 2.15%, 1.60%, 2.25%, 1.35% and 1.67% for NABIL, RBB, HBL, NICA and SBL respectively. This indicates that the return on assets for the bank is satisfactory. Likewise, Standard deviation for the NABIL, RBB, HBL, NICA and SBL are 0.5156, 0.4225, 0.5285, 0.2895 and 0.3562 respectively. From the seven years' analysis i.e., fiscal year 2072/73 to 2078/79 return on assets is greater for HBL which is 2.21% than NABIL with an average of 2.15%, SBL with an average of 1.64% and RBB with an average of 1.59%. In same way, financial surplus to assets ratio for sample banks are fluctuating trend. CV analysis shows SBL is more consistent than other sample banks with a lower CV i.e., 21.06%.

4.1.6. Analysis of descriptive statistics

The descriptive statistics for each variable used in the study are summarized in Table 4.6. The table includes four measures of credit risk: the capital adequacy ratio (CAR), the non-performing loan ratio (NPLR), the management quality ratio (MQR), which is the ratio of total operating income to total assets, and the credit to deposit. The return on assets (ROA), a single indicator of bank profitability, is also shown in the table. Statisticians that use descriptive statistics show the mean and SD.

Table 4.6

Descriptive Statistics of Study Variables

Variables	N	Mean	Std. Deviation
CAR	35	14.5020	3.87750
NPLR	35	4.5418	6.82045
CDR	35	81.6390	9.489534
MQR	35	4.3090	1.32124
ROA	35	1.8050	0.45158

Sources: SPSS results

Table 4.6 shows the CAR, NPLR, CDR, and MQR of the sample commercial banks over a seven-year period. The table displays descriptive data, including the mean and standard deviation, for characteristics related to five commercial banks from 2072/73 to 2078/79. The average ROA of the sample commercial banks is 1.8050%, with a standard deviation of 0.45158, ranging from 0.97% to 2.78%. With a CAR range of 10.39% to 20.41%, an average of 14.492 and a standard deviation of 3.87750 are produced. The range of the NPLR is 1% to 24%, with a mean of 4.5418% and a standard deviation of 6.82045.

The CDR ranges from 65.38% to 95.64, with an average of 80.629% and a standard deviation of 8.379, and the MQR ranges from 2.58% to 6.20, with an average of 4.209 and a standard deviation of 1.020. For independent variable CDR and dependent variable ROA, respectively, the standard deviation indicates the greatest variation and the lowest variation.

4.1.7. Correlation analysis

The correlation analysis determines how closely the independent variables and dependent variable are related. To ascertain the relationship between independent variables ie. CAR, NPLR, CDR, MQR and dependent variable ROA, a correlation analysis of the total data is conducted.

Table 4.7

Relationship of ROA with CAR, NPLR, CDR and MQR

Variables		Return on Assets **(ROA)**
CAR:	Pearson Correlation	.598*
	Sig. (2-tailed)	.003
	N	35
NPLR:	Pearson Correlation	-.456*
	Sig. (2-tailed)	.025
	N	35
CDR:	Pearson Correlation	.515**
	Sig. (2-tailed)	.009
	N	35
MQR:	Pearson Correlation	.578**
	Sig. (2-tailed)	.006
	N	35
ROA:	Pearson Correlation	1
	Sig. (2-tailed)	
	N	35

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

Sources: SPSS results

According to table 4.7, the link between ROA and other metrics such as the capital adequacy ratio, which is 0.598, the non-performing loan ratio, which is 0.456, the credit to deposit ratio, which is 0.515, and the management quality ratio, which is 0.578, is all significantly favorable. At the 1% and 5% levels of significance, the correlation between ROA and CAR, NPLR, CDR, and MQR is substantial. The

correlation result shows that an increase in independent factors improves the dependent variable, which is return on assets, and vice versa, with the exception of the non-performing loan ratio, which has a negative connection with return on assets.

The capital adequacy ratio (CAR), the credit to deposit ratio (CDR), and the management quality ratio (MQR) all have a positive link with return on assets. Consequently, all of these independent variables have a favorable effect on the profitability (ROA) of Nepalese commercial banks.

4.1.8. Impact analysis

Regression analysis can be used to examine how independent variables affect the profitability (Return on Asset) of Nepalese commercial banks. To understand the link between a number of independent or predictor variables and a dependent or criterion variable, multiple regressions are used. To assess the associations between variables in statistical modeling, regression analysis is a statistical technique. The only thing that a correlation analysis can tell you is whether or not there is a significant link between two variables. Even while a correlation coefficient shows a high association between two variables, it is impossible to pinpoint the precise nature of that relationship.

The effect of independent variables on the profitability (Return on Assets) of Nepalese commercial banks is forecast using multiple linear regression analysis. The effect of independent variables on Return on Assets (ROA) is expressed in the following equation:

$$ROA = \beta 0 + \beta 1CAR + \beta 2NPLR + \beta 3CDR + \beta 4MQR + ei.$$

Where,

ROA	=	Return on assets (dependent variable)
CAR	=	Capital adequacy ratio
NPLR	=	Non-performing loan Ratio
CDR	=	Credit to deposit Ratio
MQR	=	Management quality Ratio
$\beta 0$	=	Constant
$\beta 1, \beta 2 \ldots \beta 4$	=	Regression coefficients of Factor 1 to Factor 4

respectively

ei = Error term

The following tables, respectively, provide the model summary results and beta coefficients of independent variables' effects on Return on Assets (ROA):

$$\mathbf{ROA} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\,\mathbf{CAR} + \boldsymbol{\beta_2}\mathbf{NPLR} + \boldsymbol{\beta_3}\,\mathbf{CDR} + \boldsymbol{\beta_4}\,\mathbf{MQR} + \mathbf{e}_i$$

Table 4.8

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.646a	.60	.590	235.451	1.670

a. Predictors: (Constant), MQR, CAR, NPLR, CDR

b. Dependent Variable: ROA

Sources: SPSS result

The R-square, sometimes referred to as the coefficient of determination, is shown in the results table above and can be used to explain variance. The value of R-square is 0.60, which suggests that CAR, NPLR, CDR, and MQR account for 60% of the variation in the return on assets of Nepalese commercial banks. However, other factors that have not been discussed in this study account for the remaining 40% (100% - 60%).

Similar to this, after controlling for degree of freedom (df), the adjusted R-square of 0.590 indicates that CAR, NPLR, CDR, and MQR account for 59% of the variation in return on assets of Nepalese commercial banks. All independent factors and dependent variables have a strong link, as seen by this. As a result, the return on assets in profitability (ROA) of commercial banks in Nepal is significantly impacted by CAR, NPLR, CDR, and MQR.

Impact of independent variables of credit risk management on ROA using ANOVA

Table 4.9

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14038517.534	4	3509629.384	23.308	.000[b]
	Residual	1663116.637	30	55437.221		
	Total	15701634.171	34			

a. Dependent Variable: ROA

b. Predictors: (Constant), MQR, CAR, NPLR, CDR

Sources: SPSS result, 2023

The p-value is 0.000, which is less than the alpha value of 0.01 according to ANOVA. As a result, the connection between the dependent and independent variables can be accurately predicted by the model. Because of this, the independent variables (MQR, CAR, NPLR, and CDR) have a substantial role in predicting the variation in ROA. Therefore, at least one of the four independent factors contributes significantly to ROA.

Table 4.10

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1343.047	241.446		5.563	.000		
	CAR	31.658	3.487	.640	9.452	.000	.553	1.810
	NPLR	-9.369	3.503	-.251	2.674	.002	.711	1.407
	CDR	.087	.643	.008	.136	.893	.511	1.957
	MQR	44.901	4.344	.920	10.336	.000	.804	1.244

a. Dependent Variable: ROA

Sources: SPSS result

The results presented in Table 4.10 also summarizes the values of standardized beta coefficients (β_1, β_2… β_4) and the constant α with which the estimated equation for impact of independent variables on ROA can be written. Using the values of standardized beta coefficients and constant, we can write the estimated equation as follows:

$$\hat{Y} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_{4\,+}\, e_i$$

Based on the coefficients, the regression equation for the Return on Assets (ROA) of Nepalese commercial banks can be written as:

$ROA = 1343.047 + 31.658X_1 - 9.369X_2 + 0.087X_3 + 44.9016X_4 + ei$

Regression coefficient based on CAR, NPLR, CDR and MQR are 33.658, -9.369, 44.901 and 0.087 respectively.

The beta coefficients are used in regression analysis to explain the relative contribution of the independent variables to the variance of the dependent variable. As shown in Table 4.8, all independent variables have results that are significant since their p-values are less than the level of significance (i.e., p 0.01). However, as the independent variable CDR's p-value is greater than 0, the results for this variable are not significant. This demonstrates how a 1 unit increase in CAR, CDR, and MQR results in increases in ROA of 31.658, 0.087, and 44.901 respectively. However, NPLR has a detrimental effect on Nepalese commercial banks' ROA.

Testing of hypothesis

S.N	Alternative hypothesis	Result/ Finding
H1	There is positive impact of capital adequacy ratio on profitability.	0.000<0.01, H1 is accepted.
H2	There is positive impact of Non-performing loan ratio on profitability.	0.002<0.01, H2 is accepted.
H3	There is no impact of credit to deposit on profitability.	0.893>0.01, H3 is rejected.
H4	There is positive impact of management quality ratio on profitability.	0.000<0.01, H4 is accepted

4.1.9. Major findings of the study

The purpose of this study is to determine the impact credit risk management has on the financial performance and profitability of Nepalese commercial banks. The primary conclusions from descriptive and inferential statistics for dependent and

independent variables are summarized here. The main conclusions or outcomes of the examination of secondary data are as follows:

1. HBL has the highest capital adequacy ratio, at 19.45%, compared to SBL's average of 14.30%, NABIL's average of 12.85%, and RBB's average of 12.30%. The capital adequacy ratio for the sample banks also exhibits a trend of fluctuation. NABIL is more consistent than other sample banks, according to CV research, having a lower CV of 1.8%. It demonstrates that every sample bank complies with NRB guidelines regarding the capital adequacy ratio.
2. The Non-performing loan ratio (NPLR) is maximum for NICA which is 12.560% than RBB with an average of 4.265%, NABIL with an average of 3.555% and HBL with an average of 3.325%. The credit to deposit ratio for the sample institutions also exhibits a trend of fluctuation. RBB is more consistent than other sample banks having a lower CV, or 16.74%, according to CV analysis. Non-performing assets have a significant impact on the banking industry. This previous fact is not far from sample banks. The broader banking industry will be impacted if non-performing loans rise. As a result, earnings will drop and provision amount will rise. Therefore, it is advised that all of the sample banks extend loans honestly and implement efficient follow-up for the recovery of non-performing assets.
3. HBL has the highest credit to total deposit ratio of 92.18%, compared to NICA's average of 85.40%, NABIL's average of 80915%, and SBL's average of 77.6%. The credit to deposit ratio for the sample institutions also exhibits a trend of fluctuation. NICA is more consistent than other sample banks having a lower CV, or 3.60%, according to CV analysis.
4. The NABIL management quality ratio is at its highest, at 4.805%, compared to NICA's average of 4.422%, HBL's average of 4.252%, and SBL's average of 4.184%. The management quality ratio for sample banks exhibits a similar trend of fluctuation. SBL is more consistent than other sample banks having a lower CV, or 18.94%, according to CV analysis.
5. HBL bank has an overall average Return on Assets ratio of 2.21%, while SBL bank has a very low percentage of 1.64%. But compared to the other four sample commercial banks, SBL Bank's coefficient of variation (C.V.) is smaller. This indicates that SBL's profitability position is more stable. In terms of minimal

fluctuation, SBL is therefore in a better position for profitability. SBL's liquidity performance is therefore superior to that of the other four sample banks.

6. According to the findings of the connection between the dependent variable and the independent factors, CAR, CDR, and MQR significantly positively influence ROA. Similar results showed that there is a strong, yet adverse, link between NPLR and ROA.
7. According to the model summary results, CAR, NPLR, CDR, and MQR account for 60% of the change in the profitability (ROA) of Nepalese commercial banks. The remaining 40% of the change is due to other variables that were left out of this study.

4.2. Discussion

The effect of credit risk management on the financial success of Nepalese commercial banks is the subject of the current study. This study in Nepal illustrated the connections between Return on Assets (ROA) and various aspects of credit risk management, including CAR, NPLR, CDR, and MQR.

The analysis generally concludes that Nepal's commercial banks' profitability is adversely impacted by credit risk. As a result, commercial banks in Nepal must improve their ability to control credit risk, manage assets effectively, and stop inefficient management and bureaucratic activities.

The outcome shows that the capital adequacy ratio is statistically significant but favorable. Since the capital adequacy ratio was anticipated to have a positive link with the performance of the commercial banks in theory, the coefficient's sign is as normal. The outcome is consistent with Bhattarai's (2016) findings. The capital adequacy ratio (CAR) has a negative and statistically insignificant impact on profitability (ROA), according to Chhetri (2021).

Non-performing loans have a significant negative impact on commercial banks' profitability, as was predicted. The results support those made by Karki (2011), Kodithuwakku (2015), and Bhattarai (2016), who found a link between non-performing loans and bank performance that was unfavorable. Non-performing loans (NPLR) have been shown by Chhetri (2021) to negatively and statistically significantly affect profitability (ROA). The results go against those of Li and Zou (2014) and Alshatti (2015), who found that the non-performing / gross loans ratio had

a favorable impact on bank profitability. The results demonstrate that the management efficiency ratio is statistically significant and beneficial. Because it was anticipated that the management efficiency ratio would positively correlate with the performance of commercial banks, the coefficient's sign is as expected. The results of this study support the concept that management efficiency ratio has a considerable impact on the profitability of commercial banks in Nepal, according to Bhattarai (2021) and Chhetri (2019).

The results for CDR and ROA are comparable to those of Chhetri (2021), who found that profitability (ROA) and credit to deposit (CDR) had a positive but insignificant association.

The study concludes that scientific credit risk management is essential for Nepalese commercial banks in order to reduce the high frequency of non-performing loans and their detrimental impact on profitability. It also recommends that they increase the effectiveness of their credit analysis and loan management.

CHAPTER –V

SUMMARY AND CONCLUSION

The chapter of this study is broken down into three parts. A succinct description of the study is given in the first part. The study's findings are presented in the second section, and the implications learned from the analysis's context are given in the third portion.

5.1. Summary

Commercial banks act in a way that seeks to increase profits. It appears that banks are attempting to quickly balance their balance sheets. As a result, it is common to observe that almost all banks' total loan amounts are increasing quickly. These banks have also increased their deposit base to offset the rise in assets (due to an increase in loans and advances). There is no question that the expansion in loans and advances is a positive development, but these banks ought to have strong credit control policies and a risk management system in place. Banks must also proceed with extreme prudence in order to maintain a sound asset portfolio. Otherwise, these loans could easily become problematic, affecting the bank in the form of increased non-performing loans.

Credit risk management should be at the core of bank operations to ensure financial stability. The system method and controls put in place by a business to ensure the effective collection of client payments and the risk of non-payment are referred to as credit risk management. To increase the wealth of their owners, banks should properly manage their assets, liabilities, and capital. The bank's lending philosophy, particular procedures, and techniques for activity monitoring should all be outlined in the credit policy (Shakya, 2017).

Examining how credit risk affects the profitability of Nepalese commercial banks is the main objective of this study. Return on assets, which have been selected as dependent variables, as a measure of profitability. The ratios of capital adequacy, non-performing loans, management quality and efficiency, and credit to deposit are employed as independent variables. 35 observations from five commercial banks' balance panel data covering the years 2072/73 to 2078/79 were used in the analysis. The regression results show that there is a relationship between the dependent and independent variables, which makes it possible to forecast how credit risk would affect the profitability of Nepal's commercial banks. The model fits the data well, with a 60% ability to affect the profitability of Nepal's commercial banks. According to the regression model, NPLR has

a detrimental and statistically significant influence on the profitability of Nepal's commercial banks. The profitability of Nepal's commercial banks is positively and statistically significantly impacted by the capital adequacy ratio and managerial efficiency ratio. The study found a substantial association between the CAR, NPLR, and MQR and the profitability (ROA) of Nepal's commercial banks. Similar to this, CDR has no appreciable effect on the financial success of Nepal's commercial banks.

5.2. Conclusion

Using the study's objectives and analysis, the following results were reached from fiscal years 2072/73 to 2078/79:

Regarding the study's primary goal, which was to evaluate the profitability (ROA) of a sample of Nepalese commercial banks as well as the status of key credit risk indicators such NPLR, CAR, CDR, and MQR.

The analysis of bank profitability showed that among the other five sample Nepali commercial banks, HBL had the highest average ROA and SBL had the lowest average ROA. SBL has a lower coefficient of variation (C.V.) than the other five commercial banks. This indicates that SBL's profitability position is more stable. In terms of minimal fluctuation, SBL is therefore in a better position for profitability.

HBL has the highest CAR (i.e. 19.74%) which indicates that bank have enough cushions to absorb a reasonable amount of losses. NABIL has lowest CAR (i.e. 12.85%) which indicates that bank have fewer cushions to absorb a reasonable amount of losses. Therefore, HBL is in better position in terms of CAR.

Similarly, Non-performing loan ratio of SBL is lowest (i.e. 2.365%) which indicates good quality of loan and advances. NICA has the highest NPLR (i.e. 12.560%) which indicates bad quality of loan and advance. Therefore, EBL is better in profitability position in terms of NPLR.

HBL has mobilize its total deposit as loan and advances effectively in comparison to other banks as it has the highest mean (i.e. 92.18%) of loan and advance to deposit ratio. CDR of SBL is lowest (i.e. 75.92%) which indicates SBL hasn’t mobilized its total deposit as loan and advances strongly as compare to other sample banks. Therefore, HBL is in better position in terms of CDR.

Again, EBL has the lowest LLPR (i.e. 1.88%) which indicates less risky assets in total volume of loan and advances. HBL has the highest LLPR (i.e. 3.37%) which indicate riskier assets in total volume of loan and advance. Therefore, EBL is in better position in terms of LLPR.

Management Quality Ratio (MQR) of NABIL is (i.e. 4.79%) which indicates management soundness is good which means the board of directors' control over the bank's resources in order to protect shareholders' interests good. And management Quality Ratio (MQR) of SBL is lower.

The second objective of this study was to look into the connection between bank profitability and aspects of credit risk management such NPLR, CAR, CDR, and MQR. The results show a substantial positive correlation between ROA and the following ratios: capital adequacy ratio (0.598), non-performing loan ratio (-0.456), credit to deposit ratio (0.512), and management quality ratio (0.578). At the 1% and 5% levels of significance, there is a strong correlation between ROA and CRR, NPLR, CDR, and MQR. The correlation result showed that raising the independent variables raises the dependent variable, which is return on assets, with the exception of non-performing loan ratio, which has a negative connection with return on assets.

Other factors including the Capital Adequacy Ratio (CAR), the Credit to Deposit Ratio (CDR), and the Management Quality Ratio (MQR) have a favourable link with return on assets. This indicates that all of these independent variables have a favourable effect on the profitability (ROA) of Nepalese commercial banks. The study's ultimate objective was to determine how several aspects of credit risk management, including NPLR, CAR, CDR, and MQR, affected the profitability (ROA) of Nepal's commercial banks. The independent variables' effects were responsible for 60% of the overall variation in the value of ROA, according to the R-square value of 0.60. The dependent variable ROA was connected to the independent factors overall by 59 percent, according to the adjusted R-square, which was 0.590.

The findings demonstrate that the capital adequacy ratio is statistically significant and positive. Non-performing loans have a significant negative impact on commercial banks' profitability, as was predicted. The results demonstrate that the management efficiency ratio is statistically significant and beneficial. Because it was anticipated that the management efficiency ratio would positively correlate with the performance of

commercial banks, the coefficient's sign is as expected. Similar to the credit to deposit ratio, the study's findings indicate that it has no statistically significant effect on profitability.

5.3. Implications

The following applicable recommendations and implications have been included based on the study's findings and taking into account the pertinent issues:

Implications for the improvements

1. This study has discovered that non-performing loans have a detrimental effect on the commercial banks selected for this study's profitability. This study suggests that bank managers attempt to minimize non-performing loans in order to minimize credit risk and increase profit. When providing loans, the manager must proceed with the utmost care.
2. The capital adequacy ratio and the bank's profitability are positively correlated. Because of this, it is wise for a bank to keep both its core capital and statutory capital at an ideal level in order to increase profitability and guarantee that liabilities are paid when expected.
3. The study's findings indicated that profitability is positively impacted by the credit-to-deposit ratio. In other words, banks are making money off of their assets, and the investments they offer to their clients at commercial banks are growing at the same rate as deposits. This shows that banks are using loans or other investments to invest their assets in the market.
4. Management quality ratio indicates management soundness in which the board of directors' control over the bank's resources in order to protect shareholders' interests. It also should be focusing point for increase the bank's profitability.

Implications for the future researchers

1. This study took into account a few particular independent variables; additional macroeconomic factors, such as interest rates, political issues, economic policies, and so on, can be taken into account for a more solid conclusion.
2. Other factors like return on equity, net asset value per share as profitability and other factors could be included in future research. This subject may be the subject of longer-term investigation.

3. Future academics can study the banking industries by conducting primary questionnaires. Other industries including service, manufacturing, trading, hospitality, and hydro, among others, might all benefit from a similar study.
4. It could be helpful to examine how credit risk affects the profitability of Nepal's commercial banks in future studies. This helps to show how banks are doing in terms of lowering credit risk and how much it has affected their profitability.

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APPENDIXES

Appendix –A

Capital Adequacy ratio (CAR) of Sample commercial banks (In percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	12.89	10.40	20.39	13.79	12.65
2073/74	12.90	10.39	19.41	13.83	12.66
2074/75	13.10	11.46	20.33	12.24	13.26
2075/76	12.52	13.39	20.37	13.32	13.54
2076/77	13.18	11.64	19.18	13.50	14.72
2077/78	12.78	13.48	16.95	11.57	14.95
2078/79	12.77	13.46	16.95	12.55	15.96
Average	12.85	12.30	19.45	19.50	14.30
S.D.	0.235	1.325	1.455	0.685	1.305
C.V.	0.020	0.185	0.075	0.049	0.095

Non-performing Loan Ratio (NPLR) of Sample commercial banks (In percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	2.79	3.45	4.56	3.95	1.29
2073/74	2.80	3.44	4.60	4.00	1.36
2074/75	3.45	4.75	3.51	1.10	2.77
2075/76	4.74	4.59	3.29	23.00	2.93
2076/77	3.98	4.48	2.84	17.00	2.46
2077/78	2.85	3.25	1.78	24.10	1.49
2078/79	2.82	3.21	1.85	21.35	2.55
Average	3.555	4.265	3.325	12.560	2.365
S.D.	0.8260	0.6525	0.9950	10.7542	0.7275
C.V.	0.2480	0.1575	0.3075	0.7565	0.3354

Credit to Deposit Ratio (CDR) of Sample commercial banks (In percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	64.62	68.52	91.35	82.48	73.95
2073/74	65.38	69.30	92.90	83.70	74.7
2074/75	82.65	72.38	95.65	86.32	71.80
2075/76	81.95	77.15	92.64	84.55	72.93
2076/77	79.73	67.16	85.84	85.75	75.12
2077/78	89.84	73.82	91.94	90.66	85.10
2078/79	89.93	76.35	92.34	90.36	85.95
Average	80915	72.752	92.185	85.40	76.845
S.D.	8.9555	3.8940	3.7280	3.1107	5.3546
C.V.	0.1225	0.0543	0.0405	0.0650	0.0698

Management Quality Ratio (MQR) of Sample commercial banks (In percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	3.26	2.80	2.65	3.62	3.59
2073/74	3.28	2.85	2.68	3.65	3.65
2074/75	4.67	3.64	3.55	2.56	2.89
2075/76	4.85	3.75	5.75	4.25	3.26
2076/77	4.65	4.34	4.65	5.44	4.12
2077/78	5.50	4.95	4.58	6.24	4.65
2078/79	5.48	4.99	4.55	6.53	4.50
Average	4.805	3.824	4.252	4.422	3.725
S.D.	0.9954	0.7888	1.1680	1.4415	0.7123
C.V.	0.2060	0.2016	0.2755	0.3235	0.1855

Return on Assets (ROA) of Sample commercial bank (in percentage)

Fiscal Year	NABIL	RBB	HBL	NICA	SBL
2072/73	1.89	1.05	1.95	2.56	1.68
2073/74	2.69	1.60	2.15	1.64	2.13
2074/75	2.62	1.42	2.72	0.98	1.80
2075/76	2.12	2.23	2.77	1.56	1.19
2076/77	1.58	1.65	1.86	1.32	1.56
2077/78	2.72	1.10	1.60	1.90	1.50
2078/79	1.90	1.25	1.56	1.15	1.46
Average	2.15	1.60	2.25	1.35	1.65
S.D.	0.5156	0.4225	0.5285	0.2895	0.3562
C.V.	0.2264	0.2683	0.2439	0.2310	0.2106

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
CAR	35	10.39	20.41	14.5020	3.87750
NPL	35	1.00	24.00	4.5418	6.82045
CDR	35	65.38	95.64	81.6390	9.489534
MQR	35	2.58	6.20	4.3090	1.32124
ROA	35	0.97	2.78	1.8050	0.45158
Valid N (listwise)	35				

Appendix -B
Correlation Analysis

Correlations						
		CAR	NPLR	CDR	MQR	ROA
CAR	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	35				
NPLR	Pearson Correlation	.562**	1			
	Sig. (2-tailed)	.000				
	N	35	35			
CDR	Pearson Correlation	.606**	.334	1		
	Sig. (2-tailed)	.000	.050			
	N	35	35	35		
MQR	Pearson Correlation	.730**	-.024	.690**	1	
	Sig. (2-tailed)	.000	.892	.000		
	N	35	35	35	35	
ROA	Pearson Correlation	.598**	-.456*	.515**	.578**	1
	Sig. (2-tailed)	.003	.025	.009	.006	
	N	35	35	35	35	35
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

(Source: SPSS Version 25)

Appendix-C

Regression Analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.646[a]	.600	.590	235.451	1.670

a. Predictors: (Constant), MQR, CAR, NPLR, CDR

b. Dependent Variable: ROA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1343.047	241.446		5.563	.000		
	CAR	31.658	3.487	.640	9.452	.000	.553	1.810
	NPLR	-9.369	3.503	-.251	2.674	.002	.711	1.407
	CDR	.087	.643	.008	.136	.893	.511	1.957
	MQR	44.901	4.344	.920	10.336	.000	.804	1.244

a. Dependent Variable: ROA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14038517.534	4	3509629.384	23.308	.000[b]
	Residual	1663116.637	30	55437.221		
	Total	15701634.171	34			

a. Dependent Variable: ROA

b. Predictors: (Constant), MQR, CAR, NPLR, CDR