CREDIT MANAGEMENT AND PROFITABILITY OF COMMERCIAL BANKS IN NEPAL

A Dissertation submitted to the Office of the Dean, Faculty of Management in partial fulfillment of the requirements for the Master's Degree

by:

Smriti Poudel
Exam Roll No.: 14109/19
Campus Roll No.: 3137/075
T.U. Regd. No.: 7-2-39-624-2014
Shanker Dev Campus

Kathmandu, Nepal
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CERTIFICATION OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled **"Credit Management and Profitability of Commercial Banks in Nepal"**. The work of this dissertation has not been submitted previously for the purpose of conferral of any degrees nor it has been proposed and presented as part of requirements for any other academic purposes.

The assistance and cooperation that I have received during this research work has been acknowledged. In addition, I declare that all information sources and literature used are cited in the reference section of the dissertation.

Smriti Poudel
Signature: ……..
Date: ……

REPORT OF RESEARCH COMMITTEE

Ms. Smriti Poudel has defended research proposal entitled **"Credit Management and Profitability of Commercial Banks in Nepal"** successfully. The research committee has registered the dissertation for further progress. It is recommended to carry out the work as per suggestions and guidance of supervisor Asso. Prof. Dr. Kapil Khanal and submit the thesis for evaluation and viva voce examination.

Asso. Prof. Dr. Kapil Khanal

Dissertation Supervisor

Signature: …….

Dissertation Proposal Defended Date:

……

Dissertation Submitted Date:

……

Asso. Prof. Dr. Sajeeb Kumar Shrestha

Chairperson, Research Committee

Signature: …….

Dissertation Viva Voce Date:

……

APPROVAL SHEET

We, the undersigned, have examined the dissertation entitled **"Credit Management and Profitability of Commercial Banks in Nepal"** presented by Smriti Poudel a candidate for the degree of master of Business Studies (MBS Semester) and conducted the Viva voce examination of the candidate. We hereby certify that the dissertation is worthy of acceptance.

……
Asso. Prof. Dr. Kapil Khanal
Dissertation Supervisor

……
Internal Examiner

…….
Internal Expert

…….
External Expert

…….
Asso. Prof. Dr. Sajeeb Kumar Shrestha
Chairperson, Research Committee

……
Asso. Prof. Dr. Krishna Prasad Acharya
Campus Chief

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This study entitled **"Credit Management and Profitability of Commercial Banks in Nepal"** has been prepared in partial fulfillment for the Degree of Master of Business Studies (MBS) under the Faculty of Management, Tribhuvan University is based on research models involving the use of quantitative aspect of credit management and profitability of commercial banks in Nepal.

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Smriti Poudel

Date: ……

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ABBREVIATIONS

BS	:	Bikram Sambat
CB	:	Commercial Banks
CDR	:	Credit to Deposit Ratio
CRR	:	Cash Reserve Ratio
EBL	:	Everest Bank Limited
INF	:	Inflation Rate
IT	:	Information Technology
JVBs	:	Joint Venture Banks
L & A	:	Loan and Advance
LEV	:	Leverage Ratio
LSIZE	:	Log of Total Assets
Ltd.	:	Limited
NABIL	:	Nabil Bank Limited
NBL	:	Nepal Bank Limited
NPL	:	Non – performing Loan
NPLR	:	Non – performing Loan Ratio
NRB	:	Nepal Rastra Bank
ROA	:	Return on Assets
ROE	:	Return on Equity
SBI	:	Nepal SBI Bank Limited
SCB	:	Standard Chartered Bank Nepal Limited
SD	:	Standard Deviation
SIZE	:	Total Assets of Banks
TA	:	Total Assets
TU	:	Tribhuvan University

ABSTRACT

This study investigates the credit management and profitability of commercial banks in Nepal. Secondary data was gathered from commercial banks of Nepal for ten year periods (2013/14-2022/23). This study used correlation and multiple regression analysis to analyze the data. This study shows that the credit risk position in terms of non-performing loan ratio of Nepalese commercial banks performing best or maintaining their NPLs perfectly among them which shows sample banks have low credit risk. Profitability position in terms of ROA and ROE, sample banks could manage their overall operations due to high ratio which means sample banks have generated income and making progressive performance. The correlation analysis concluded that cash reserve ratio has significant positive relation with ROE. Likewise, there is significant positive correlation between credit to deposit ratio with profitability (ROA and ROE). However, non-performing loan ratio has insignificant negative relationship with profitability. Then, leverage ratio has insignificant negative relationship with ROA but significant positive relationship with ROE. Further, bank size has significant negative relationship with profitability of the banks. The multiple regression analysis shows that cash reserve ratio has insignificant negative effect on ROA and significant positive effect on ROE of the banks. Then, credit to deposit ratio has insignificant positive impact on profitability whereas non-performing loan ratio has insignificant negative impact on profitability of the sample banks. Besides these, leverage has significant negative impact on profitability ROA and insignificant positive impact on ROE of the banks. Finally, banks size has significant negative impact on ROA and ROE. Therefore, this study concluded that there is insignificant negative effect on profitability in Nepalese commercial banks.

Keywords: Return on assets, cash reserve ratio, credit to deposit ratio, non-performing loan ratio and leverage ratio.

CHAPTER – I
INTRODUCTION

1.1 Background of the Study

The potential for monetary loss in the event that a counterparty or bank borrower neglects to carry out their obligations in accordance with the terms of the contract. Since credit risk directly threatens the stability of financial institutions, it is the most prestigious risk within financial organizations and has a bigger impact than other risks (Vidyashree & Rathod, 2015). Comparing credit risk to other types of risk, its enormous breadth and magnitude of loss can result in significant loan losses and possibly bank collapse. Even though financial institutions have dealt with problems over the years for a variety of reasons, the main causes of serious banking issues remain to be weak credit standards for borrowers and counterparties, ineffective portfolio risk management, or a failure to pay attention to changes in economic or other conditions that could worsen a bank's counterparties' credit standing (Basel, 1999).

For commercial banks, loans and advances represent the main source of credit risk. However, a bank's operations could also expose it to other types of credit risk, like exposures on and off the balance sheet, in the trading and banking books, and other places. Banks are exposed to credit risk, also known as counterparty risk, in addition to loans and advances when handling acceptances and endorsements, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, commitments and guarantees, and transaction settlement. By keeping credit risk exposure within reasonable bounds, credit risk management seeks to optimize a bank's risk-adjusted rate of return. Banks must manage the credit risk entailed in the overall portfolio in addition to the risk connected with individual loans as transactions (Chhetri, 2021).

Credit risk management should be central to banks' business operations in order to preserve their financial stability and soundness. In rich as well as emerging nations, there have been increasingly significant bank problems throughout time, notwithstanding these facts (Brownbridge & Harvey, 1998). Weaknesses in credit risk

management have long been seen as the primary cause of bank problems (Richard et al., 2008).

The role of credit risk management in the banking industry has changed significantly as a result of the growth of commercial economies and the local and global spread of credit risks in financial institutions. Banks invest a large amount of resources in credit risk management modeling (Shrestha, 2022). The process of continuously developing supervisors' ability entails practicing risk-focused supervision on a regular basis. A risk-focused approach raises awareness of the value of formal, documented risk management frameworks within the banking sector, particularly among small banks. Effective risk management for commercial banks is essentially built on standards of governance and leadership and functions as both an offensive and defensive defense. Since recognized hazards are less dangerous than unidentified ones, risk identification plays a crucial role in bank management.

Banks place a great importance on credit risk management since it is an essential stage in the loan application process. It maximizes bank risk and adjusted risk rate of return by maintaining credit risk exposure with the goal of shielding the bank from credit risk's detrimental effects. Banks are investing a lot of money on credit risk. Another definition of credit risk is "the possibility that a contractual party will neglect to fulfill its obligations in line with the agreed terms." Credit risk is also known as counterparty risk, default risk, and performance risk. Risk management techniques encompass several approaches such as assigning the risk to a different entity, steering clear of the risk, mitigating its adverse impact, and embracing some or all of the outcomes associated with a certain risk (Vaidya, 2014).

The term "profitability" describes the positive return on an investment or commercial venture after all costs have been deducted. A company's profitability is determined by subtracting all of its expenses from its total revenue. A company's whole operations depend on its ability to turn a profit, so if it fails it may have an impact on suppliers, workers, and the community. A company's profitability serves as a gauge of its overall success. For life, this synchronization is essential. Investors could want a single profitability metric that makes sense in every circumstance. The goal of the test of profitability is to determine if income is sufficient by contrasting it with one or

more major activities that are reported in the financial statements (Garrinson & Norren, 2005).

The potential of a country to grow and prosper is determined by the strength of its financial institutions. However, there are several hazards connected to starting company that keep people from reaching their goals. The possibility that a borrower won't return all or part of the money borrowed, plus interest, is known as credit risk. One of the most crucial roles in a company that helps to lessen the negative effects of credit risks is credit management (Bikker & Metzmakers 2005). The ability of any business, but financial institutions in particular, to manage credit risk is essential to its success and profitability. Despite their best efforts, commercial banks nevertheless carry credit risk, as seen by the small losses they sustain from failed borrowers. Banks handle a variety of challenges, but the primary one they handle, either directly or indirectly, is controlling credit risk. The goal of credit risk management is to increase a company's risk-adjusted rate of return by keeping risk exposures at reasonable levels. Banks are required to manage both the credit risk associated with the portfolio as a whole and the credit risk arising from individual transactions or credits (Haneef et al., 2012). Nonetheless, among other things, there have been grievances raised over a high percentage of defaulters, insufficient monitoring, and noncompliance with duties. To identify a way to increase business profitability through efficient credit risk management procedures, it is critical to evaluate how different aspects of credit risk management affect the profitability of financial information.

Commercial banks in Nepal have been overcoming a number of obstacles, particularly those related to lending and credit. Lending is becoming more of an issue due to the nation's economic situation, evolving legal regulations, and defaulting borrowers. One of the largest hazards banks face is credit risk. Credit risk arises when a borrower defaults. It could result from unwillingness or incapacity to carry out the mutually agreed-upon follow-through. A bank's book value is also impacted by its credit risk. A bank's likelihood of going bankrupt increases with the quantity of credit that is at risk. Therefore, there is a chance that a depositor's standing in the bank would deteriorate and their money will lose value. Therefore, the purpose of this study is to examine how credit management affects bank profitability in Nepal.

1.2 Problem Statement

Among the phases in the credit risk management process are target market identification, credit extending, credit monitoring, and proceeds calculation. The procedures, guidelines, and standards that control how bank employees approve loans and manage the loan portfolio in compliance with banking regulations are included in the credit management policy. It is a system of rules intended to optimize credit's advantages while lowering its drawbacks. Noman et al. (2015) discovered the significant and adverse impact of CAR on ROAE. Furthermore, Basel II showed a substantial negative ROAE but a significant positive NIM.

Alshatti (2015) stated that NPLR significantly increases ROA and ROE, while CAR had a negligible negative impact on both. Gijaw et al. (2015) shown that capital sufficiency and non-performing loans have a major effect on Ethiopian banks' profitability. Annor and Obeng (2017) mentioned that there was a positive correlation between a bank's capital adequacy ratio and profitability, although a statistically significant negative correlation exists between non-performing loans and profitability. Ifeanyi and Francis (2017) found that non-performing loans had a negative and insignificant impact on profitability, while loans and advances and loan loss provision had a positive and insignificant effect.

Singh and Sharma (2018) showed that there was a negative correlation between ROA and NPLR and a strong and positive correlation between ROA and CAR and LPNPL. Al-Eitan and Bani-Khalid (2019) showed that whereas bank size had a favorable and substantial influence on the financial performance of these Jordanian commercial banks, CR had a negative and significant association with profitability. According to Olaoye and Fajuyagbe (2020) revealed non-performing loans have a detrimental effect on profitability. Munangi and Sibindi (2020) found NPLR had a no significant beneficial impact on ROE but a considerable negative impact on ROA. On the other hand, CAR significantly improved ROA while having a negligible detrimental impact on ROE.

Nelson (2020) asserted that both the non-performing loan ratio and the loan loss provision ratio have a negative effect on ROE. Biswas et al. (2021) revealed that there was a statistically significant positive correlation between return on assets (ROA) and

the capital adequacy ratio (CAR), and a substantial negative correlation between ROA and non-performing loans (NPL) and bank size. Dunyoh et al. (2022) revealed that NPLR significantly decrease profitability (ROA and ROE). Yeasin (2022) showed the considerable detrimental impact non-performing loans have on financial performance. The capital adequacy ratio, meantime, had a negligible detrimental impact on ROA (financial performance). Butola et al. (2023) stated that NPLR had a negative correlation with ROA, whereas the credit to deposit ratio and CAR had a strong correlation with ROA.

In Nepalese context, Bhattarai (2016) found that there was a negative correlation between the non-performing loan ratio and bank performance, but a positive correlation between bank size and performance. Shrestha (2017) found that debt and NPLR significantly decreased ROE and ROA. However, the cash reserve ratio had a very little negative impact on ROE and ROA. Poudel (2018) found that the profitability of Nepalese commercial banks is significantly harmed by inflation and credit risk. However, the profitability of Nepal's commercial banks was greatly boosted by the capital adequacy ratio and total assets.

Shrestha and Nirouala (2021) concluded that NPLR and CDR significantly decreased ROA. Conversely, ROA gains from the predictors IRS and CAR. Chhetri (2021) mentioned that non-performing loans significantly reduce profitability (ROA). Bank size and CAR have insignificant negative impacts on ROA. Lastly, ROA was somewhat positively impacted by the capital adequacy ratio. Shrestha (2022) observed that TL/TD had a major positive influence on the profitability of Nepalese commercial banks, but NPL/TL and LLP/TL had a negative impact. Empirical data had shown that there is a conflicting link between Nepalese commercial banks' profitability and credit risk. Therefore, the purpose of this study is to determine how credit risk affects the profitability of Nepalese commercial banks. This research specifically relates to the investigation and resolution of the following queries about the chosen commercial banks.

- What is the credit risk and profitability position of commercial banks in Nepal?

- Is there any relationship between credit risk management and profitability of commercial banks in Nepal?
- Do credit risk factors (cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio and bank size) effect on profitability of commercial banks in Nepal?

1.3 Objectives of the Study

The main purpose of the study is to evaluate the credit management and profitability of commercial banks in Nepal. The other specific objectives are as follows;

- To assess the position of credit risk and profitability position of commercial banks in Nepal.
- To examine the relationship between credit risk management and profitability of commercial banks in Nepal.
- To analyze the impact of credit risk factors (cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio and bank size) on profitability of commercial banks in Nepal.

1.4 Research Hypothesis

Credit risk plays an important role on banks' profitability since a large chunk of banks' revenue accrues from loans from which interest margin is derived. Based on the information we have studied in the previous part; we have realized that it is of great interest to study the relationship between credit risk management and profitability of commercial banks.

H_1: Cash reserve ratio has significant impact on profitability of commercial banks in Nepal.

H_2: Credit to deposit ratio has significant impact on profitability of commercial banks in Nepal.

H_3: Non performing loan has significant impact on profitability of commercial banks in Nepal.

H_4: Leverage ratio has significant impact on profitability of commercial banks in Nepal.

H_5: Bank size has significant impact on profitability of commercial banks in Nepal.

1.5 Rational of the Study

The results of the study help the management of Nepalese various banks to effectively manage risk and understand how credit risk and bank profitability are related, which helps them to lower losses and raise profitability. It can also serve as a literature source for other academics who want to do more study on how risk management affects profitability with a focus on financial organizations. It was anticipated that the main findings of the study would highlight possible directions for improving strategic interventions. In addition, the study was an academic experience for the researcher and a resource for other scholars and researchers in related subjects. Furthermore, since this type of research has policy consequences, the study's findings could be used as a basis for rules governing the credit risk management systems used by Nepalese banks.

1.6 Limitations of the Study

The study has some limitations. The main limitations of the study are as follows:

- There are 20 commercial banks operating in Nepal (Up to July, 2023), but only five commercial banks NABIL, SBI, EBL, SCB and NBL are taken for this study.
- This study concentrates only credit risk management and profitability of commercial banks in Nepal and ignores the other financial aspects.
- The study is based on secondary data such as financial annual reports, financial statement, books, journals and articles etc.
- The period of the study is limited from fiscal year 2013/14 to 2022/23.
- This study used descriptive statistic, correlation and multiple regression analysis to analyze the data.

CHAPTER - II
LITERATURE REVIEW

This chapter provided a survey of the literature written by other scholars that was pertinent to the study's objective. The chapter was organized in accordance with the specific goals to ensure relevance to the components of credit management and profitability of commercial banks in Nepal and overseas. Books, journals, theses, and dissertations were among the credible primary sources that served as the foundation for the literature evaluation. It specifically looked at the theoretical and practical literature on credit management approaches.

2.1 Theoretical Review

2.1.1 Theories of Credit Risk

In this section, literature is reviewed guided by six theories; credit market theory, loan pricing theory, adverse selection theory, information asymmetry theory, finance distress theory and portfolio theory.

2.1.1.1 Credit Market Theory

Ewert (2000) argued a neoclassical credit market model is predicated on the idea that loan terms clear the market. The interest rate is the sole pricing mechanism in the event that collateral and other covenants stay the same. The interest rate rises in response to a certain customer supply and an increase in credit demand, and vice versa. It follows that the interest premium will rise in direct proportion to the likelihood of the borrower failing. Ugbede et al. (2012) argued for a modified theoretical framework that takes economic openness into consideration when analyzing how internal and external variables affect interest rate activities in a semi-open country like Nigeria. Assume that we live in a closed economy, where the demand for money is equal to the supply of actual money and there is no net capital inflow or outflow. In an economy like this, the only purposes of the money held by the economic units are to fund transactions and raise the money demand in proportion to actual output. It is important to remember that owning money has an opportunity cost, which is determined by the nominal rate of interest. Higher interest rates make it less desirable to store wealth in the form of cash.

2.1.1.2 Loan Pricing Theory

Stiglitz and Weiss (1981) assert that banks do not always have the capacity to establish high interest rates. Due to the extreme difficulty of anticipating the kind of borrower at the outset of the banking relationship, moral hazard and adverse selection are factors that banks should consider. Banks that set interest rates too high run the danger of causing adverse selection problems because high-risk borrowers are prepared to pay these high rates. These borrowers may engage in moral hazard conduct, sometimes referred to as borrower moral hazard, as they are likely to embark on exceedingly hazardous projects or investments after being granted the loans (Chodecai, 2004). Stiglitz and Weiss' logic suggests that we might not always conclude that bank interest rates are appropriate given the risk incurred by borrowers.

2.1.1.3 Adverse Selection Theory

Jappelli and Pagano (1993) proposed the adverse selection model hypothesis, which states that information sharing lowers interest rates, broadens the pool of potential borrowers, and lowers default rates. Furthermore, it can result in the granting of further loans. However, in some cases, when banks have a monopoly in a particular field, lending declines. This is due to the fact that lending to the former does not offset the latter's decline in lending, and information sharing increases the likelihood that banks may differentiate their lending rates for riskier and safer customers. Lending activity tends to boost competition when credit markets are contestable, which restricts the banks' capacity to charge their clients rent. Information sharing also tends to increase banking rivalry (Jappelli & Pagano, 2002).

Based on this theory, information sharing ought to increase lending while decreasing interest rates and default rates as credit bureaus either penalize defaulters or encourage competition by reducing informational rents. In extreme situations, lending in places where credit would not typically be accessible might be made possible via information sharing. These models suggest that banks that choose to communicate boost their customer welfare as well as their own profitability, producing a Pareto improvement (Jappelli & Pagano, 2002).

2.1.1.4 Information Asymmetry Theory

The global banking sector is currently confronted with a number of problems and obstacles that, if not successfully resolved, may slow down Basel II's adoption and implementation. Bergh et al. (2019) argued these comprise accurate and trustworthy data and information. Banks must be provided with enough data to allow them to fully evaluate the borrower's or counterparty's actual risk profile. Stiglitz and Weiss (1981) have identified the following as the causes of information asymmetry: workers know more about their skills than the employer; insurance customers know more about their health, including whether or not they smoke and drink excessively; car owners know more about their vehicles than potential buyers; business owners know more about their companies than possible investors; and borrowers know more about their risk tolerance than the lender. The degree to which management possess greater knowledge about the company than do investors overall might serve as a proxy for information asymmetry. A secondary attribute to consider is the degree to which investors' knowledge of the company differs from one investor group to the next (Watts & Zimmerman, 1990). Information asymmetry between lenders and borrowers is expected in the financial markets due to the availability of both ignorant lenders and knowledgeable borrowers, whose personal information the lender uses to determine whether to lend money.

2.1.1.5 Finance Distress Theory

Baldwin and Mason (1983) purported that a company is considered to be in financial distress when its operations become so unviable that it is unable to pay its debts. Violating loan repayment terms and ceasing or reducing dividend payments are the first signs of financial trouble. Whitaker (1999) defined financial hardship as beginning in the first year in which cash flows are less than the long-term debt of current maturities. The corporation has enough money to pay its creditors as long as cash flows exceed current debt commitments. The main factor influencing businesses experiencing a financial crisis is their inability to satisfy debt-related contractual commitments. However, the financial crisis has significant aftereffects that manifest well in advance of default. Wruck (1990) asserted that a number of reasons, such as deteriorating performance, inadequate risk management, and economic crises, can cause organizations to encounter financial trouble. Boritz (1991) depicted According to Boritz (1991), a financial crisis process starts with an incubation stage marked by

unfavorable economic conditions and incompetent management that makes expensive errors. The financial distress theory is still relevant today because of the credit risk and liquidity that a company faces. A liquidity crisis may arise in the case of commercial banks due to their inability to lend money to borrowers and give cash to depositors when needed. It is imperative for enterprises to consider other creditors when implementing risk management strategies. Since credit risks in banks have the potential to cause financial hardship, they must also be handled. The management of the loan portfolio has a significant impact on the firm's liquidity. To keep themselves out of financial trouble, banks need to control their exposure to credit and liquidity risk. The subject of how credit risks affect financial performance was raised by the aforementioned.

2.1.1.6 Portfolio Theory

Banks have successfully used modern portfolio theory (MPT) to manage market risk since the 1980s. Value at risk (VAR) and earnings at risk (EAR) models are now widely used by banks to control their exposure to interest rate and market risk. Regretfully, though, the application of MPT to credit risk has fallen behind, despite the fact that credit risk continues to be the biggest risk that most banks face (Margrabe, 2007). According to the portfolio theory, banks have often managed credit risk asset-by-asset. Although every bank has a different process, generally speaking, this strategy entails applying a credit risk rating, analyzing the credit quality of loans and other credit exposures on a regular basis, and summing the findings to determine the projected losses for a portfolio (Gakure et al., 2012). Gakure et al. (2012) stated an internal credit risk rating system and a thorough loan evaluation form the basis of the asset-by-asset method. Using this method, managers may quickly spot changes in individual loans or portfolio trends thanks to a loan review and credit risk rating system (Gakure et al., 2012). Management may quickly adjust portfolio strategies or step up credit monitoring based on the findings of its problem loan detection, loan review, and credit risk rating system.

The asset-by-asset method is a vital tool for controlling credit risk, but it only offers a partial picture of portfolio credit risk, which is defined as the chance that actual losses would surpass projected losses. Consequently, banks are looking more and more to supplement the asset-by-asset approach with a quantitative portfolio assessment

utilizing a credit model in order to obtain a deeper understanding of credit risk. Banks are exploring a portfolio strategy in an effort to solve the asset-by-asset method's inability to adequately evaluate unexpected losses. The portfolio offers a framework for defining and quantifying investment risk as well as for creating linkages between risk and projected returns. It is based on the fundamental premise that investors frequently seek to optimize returns from their assets for a given amount of risk. The asset-by-asset approach's inability to accurately identify and quantify concentration is one of its weaknesses. Concentration risk is the term for extra portfolio risk brought on by a greater degree of exposure to a borrower or to a collection of related borrowers (Margrabe, 2007).

2.1.2 Meaning of Credit Risk

Credit risk is the likelihood that a borrower won't carry out its obligations in accordance with the specified terms and conditions. Exposures to loan activities, interbank transactions, and off-balance sheet activity are all considered forms of credit risk. CRM aims to maximize the bank risk adjusted rate of return by maintaining the CRE within permitted limits. For most banks, loans are the most important and least known source of credit. All facets of a bank's business, including its trading and banking books, as well as its on and off balance sheet activities, could nevertheless carry significant credit risk (Michel et al., 2001).

Banks are more susceptible to credit risk and counterpart risk in financial instruments other than loans, like acceptance, interbank transactions, trade financing, foreign currency transaction and guarantee, and transaction settlement. Credit is generally regarded as the asset that yields the most income, especially for commercial banks. Credit is seen as the commercial bank's lifeblood because of the volume of transactions it handles. It encompasses the vast portion of the capital. It is the main component that determines profitability and produces profit. It has an overall effect on the economy (Horcher, 2005).

In the present scenario, it also has some impact on the national economy since it elevates the standing of the client if the bank extends credit to a store. In a similar vein, it also supplies industry and trade with currency. They will pay taxes to the government, which will support growth in the overall economy. It serves as a

safeguard against depositors as well. From the outset, it is assumed that Credit is the derivative of wealth maximization. While there are other elements that might impact profitability and wealth maximization, credit risk is thought to be the most influential. Since it is the foundation of commercial banking, it is the most difficult task (Vaidya, 2014).

2.1.3 Classification of Credit

Credit categorization is the process by which banks examine their loan portfolio and assign loans to groups or grades in accordance with central bank criteria and other pertinent loan characteristics and perceived risk. Banks are able to keep an eye on the quality of their loan portfolios and take remedial action to lower risk thanks to the ongoing loan review and classification process. To reduce potential risk in bank lending, Nepal Rastra Bank has issued the following guidelines for classifying loans and advances and providing for losses. These guidelines are based on the authority granted by subsection 1 of section 23 of the NRB Act 2012 (revised) and section 19(ka) of the Commercial Bank Act (revised). The NRB classifies loans into the following five categories:

- Pass loan
- Watch List
- Substandard loan
- Doubtful loan
- Bad Loan

Pass Loan

Pass loans are those advances and loans whose installments (repayments) are either not due at all or are due within a month. We refer to these loans as performing loans.

Watch List

The loans and advances that fall under the pass loan category and have the aforementioned characteristics need to be added to a watch list.

- Payments for principal and interest are past due by longer than three months.
- Working capital loan and short term maturity period were temporarily extended, but not renewed on time.

- A loan from another bank or financial institution has been labeled as non-performing. (For the same Debtor)
- Regular loans (such as working capital or short-term loans) given to businesses and corporate entities that have had a consistent net worth decline over the previous two years.
- Projects that benefit from multibank financing but are not converted to consortium financing in accordance with Directive No. 2's Section 33.
- Loans and advances that show inadequate cash flow upon bank scrutiny and are placed on a watch list.

Sub-Standard Loan

Sub-standard loans are defined as loans and advances with installment (repayment) terms longer than three months but shorter than six months.

Doubtful Loan

Doubtful loans are those advances and loans whose installments (repayment) are due in less than a year but more than six months.

Bad Loan (Loss)

If the installment (repayment) on a loan or advance is not due for over a year, the loan or advance must be deemed a poor loan (loss).

2.1.4 Credit Risk Management Framework

Interest rate, currency rate, commodity, and real estate price fluctuations are nothing new. However, the corporate strategy and performance of the banks and their client clients were unstable due to fluctuations in economic and financial variables. As a result, it is essential that those banks establish a structure for marketing their clients their services. One way to manage risk in a bank is either on the balance sheet through portfolio composition adjustments or off the balance sheet using a variety of weaponry derived from financial engineering technology. These off-balance sheet weaponry are referred to as derivatives contracts of activities, or simply "derivatives" (John, 1998).

The risk management framework rests on three pillars are summarized as follows.

- For traditional banks, this means making good locus and investments.
- Additionally, for traditional banks, it means making good investment decisions regarding their non-traditional activities, such as investment banking, mutual funds, and insurance derivatives. Sound investment decisions generate corporate value.
- The secret to making wise investments is to generate adequate cash flows domestically.
- Banks that don't produce cash flow internally typically make larger investment cuts than their rivals. In the banking industry, preserving a firm's capital adequacy depends critically on producing enough cash flow internally. In turn, having enough capital is necessary for growth and wise investment decisions. In terms of expenses and management, banks with insufficient capital are vulnerable to increased deposit insurance premiums, heightened regulatory oversight, and potential acquisition by third parties.
- A bank should carefully and prudently examine significant market indicators.
- Since unfavorable changes in external variables like interest rates and commodity prices might impair a company's capacity to invest and cause cash flow problems.

2.1.5 Systems and Procedures of Credit Policy

A strong credit policy interacts with all lending areas in an efficient manner, which eventually aids in the smooth operation of the business. In terms of credit policy, a bank must essentially adhere to the following processes and practices.

a) Credit Origination

Banks must adhere to fair and unambiguous rules for both new loan applications and loan extensions. The institution's target markets and lending strategy must be followed while awarding the loans. Before approving a lending facility, the banks must assess the client transaction's risk profile. This could include:

i. The borrower's industry's credit evaluation, taking into account macroeconomic variables.
ii. The loan's objective and the source of repayment.

iii. The borrower's credit history and repayment record.
iv. Determine the borrower's ability to repay the loan;
v. Examine the suggested terms, conditions, and covenants.
vi. Equivalency and enforceability of security.
vii. Accepted by the proper authorities

When entering into a new connection, the borrowers' or counterparty's reputation, legal capability to undertake liability, and honesty should all be taken into account. The bank must familiarize itself with the borrower or counter party before beginning any new credit relationship in order to ensure that it is working with a reputable and creditworthy person or company. Nonetheless, a bank cannot approve credit merely because the applicant is thought to be very trustworthy; name lending must to be avoided (Koch & Macdonald, 2004).

Institutions should consider the borrower's financial situation, the anticipated use of the money, and the quantity and timing of the cash flows when designing lending facilities. When issuing a credit facility, it is crucial to carefully weigh the risk-reward trade-off and price credit to account for all associated expenses. It is important to establish pertinent terms and conditions to safeguard the institution's interests (Joseph, 1998).

Institutions are required to ensure that loans are utilized for the intended purpose. When an obligor uses funds for uses not specified in the original proposal, institutions need to investigate the potential effects on creditworthiness. This kind of scrutiny is especially crucial when it comes to corporate loans where the borrower owns a group of companies. Organizations ought to categorize these affiliated businesses and evaluate their credit collectively. The lead institution typically handles the majority of the credit analysis and evaluation in loan syndication. Although this kind of information is valuable, institutions shouldn't rely too much on it. It is recommended that each syndicate member conduct their own independent analysis.

An institution shouldn't rely too much on covenants or collaterals. Although collateral held against a loan is unquestionably important, its capacity to service debt and its standing in the market should take precedence over collateral as a buffer that protects

the lender in the event of failure (Reed et al., 1980).

b) Limit Setting

Setting exposure limits for individual borrowers and groups of related borrowers is a crucial part of credit risk management. According to Nepal Rastra Bank, "institutions are expected to develop their own limit structure while remaining within the exposure limits set by the central bank." The obligor's creditworthiness, the actual need for credit, the state of the economy, and the institution's risk tolerance should all be taken into consideration when determining the amount of the limitations. Limits appropriate to the relevant products and activities should be established. To reduce the risk of concentration, institutions may set restrictions for a particular industry, economic sector, or geographic area (Vaidya, 2014).

The obligor may occasionally choose to disclose the facility restrictions to its affiliated businesses. If the transactions are substantial and regular, institutions ought to examine these agreements and set the appropriate restrictions. Credit limitations ought to be checked on a yearly basis, or more often if the credit quality of the obligor starts to decline. Every request for a rise in credit limits needs to be supported.

c) Loan Administration

A crucial step in the lending process is the ongoing management of the loan portfolio. The loan administration role is essentially a back office task that oversees and supports loan maintenance and extension. An average loan administration unit carries out the following duties (Reed et al., 1980):

i) Documentation

Ensuring the correctness of documents (loan agreements, guarantees, title transfers of collateral, etc.) in compliance with authorized terms and conditions is the duty of loan administration. To guarantee execution and reception, outstanding papers should be monitored and followed up on.

ii) Loan Disbursement

Before inserting facility restrictions into computer systems, the loan administration function should make sure the loan application has received the appropriate

permission. Only when covenants are fulfilled and collateral holdings are received should payments be made. In the event of an exception, the relevant authorities' consent should be sought.

iii) Credit Monitoring

Following approval and authorization for drawdown, the loan has to be closely monitored. These include monitoring timely repayments, completing periodic collateral valuations, spotting early indications of irregularity, and tracking borrower compliance with lending conditions.

iv) Loan Repayment

When the main or markup installment is due, the obligors should be informed in advance. Any deviations, including non-payment or payment after the due date, must to be noted and reported to management. Following reception, accurate documentation and revisions must also be made.

v) Maintenance of Loan Files

Establishing standards and procedural guidelines for loan file maintenance is something that institutions should do. In addition to containing all contact with the borrower, the loan files should include enough information to evaluate the borrower's financial situation and repayment history. It goes without saying that data should be arranged such that NRB inspectors, internal and external auditors, may evaluate it with ease.

vi) Collateral and Security Documents

Institutions need to make sure that every security document is stored in a dual-control, fireproof safe. To monitor the movement of documents, registers need to be kept. Additionally, protocols for tracking and reviewing pertinent insurance coverage for particular facilities and collateral should be established. Regular physical inspections of security documents are necessary (Reed et al., 1980).

2.1.6 Factors Affecting Credit of a Bank

2.1.6.1 Deposit

In addition to accepting deposits and providing checking account services, commercial banks also make personal, business, and mortgage loans in addition to providing savings accounts and certificates of deposit (CDs) to people and small businesses. The majority of individuals do their banking business with commercial banks rather than investment banks (Crosse, 1963).

The way commercial banks generate revenue is through lending money and collecting interest on such loans. A commercial bank may grant a variety of loans, such as personal, business, auto, and home loans. A commercial bank may focus on one or a few lending categories.

2.1.6.2 Non-performing Loan

NPL is another important credit factor. One of the main issues facing the banking system in Nepal is non-performing loans, or NPLs. NPLs are giving the banking industry greater issues in the current banking environment. In general, advances that don't produce revenue are what are referred to as non-performing assets. Put differently, it describes any company's idle assets that are unable to be turned into cash within a specified period of time. NPL is created if credit extended by banks and other financial institutions defaults. NPL proportion in the asset portfolio demonstrates the bank's health. The amount of non-performing assets (NPA) in a given financial institution is a key indicator of its performance. Since loans and advances are the bank's main sources of revenue, a rise in non-performing loans could put the institution in danger of failing (Shrestha, 2022).

Non-performing loans are advances for which there is a 90-day or longer grace period before interest or principal repayment is required. When an advance or loan doesn't meet its payback terms, it's considered non-performing. As a result, non-performing loans are those that might default. The amount of non-performing loans (NPLs) is a measure of how well bankers manage credit and allocate resources to profitable industries. Credit risk is defined by the Basel Committee on Banking Supervision as the possibility that a borrower won't fulfill their commitment according to the

conditions that were agreed upon. A greater number of bank failures were caused by non-performing loans (Ifeanyi & Francis, 2017).

2.1.6.3 Liquidity

How simple it is to turn assets into cash is referred to as liquidity. The status and a portion of the assets are what the commercial banks can utilize to satisfy their obligations. Both the liquidity found on the balance sheet and the liquidity made accessible by funds that have been purchased can be used to define liquidity (Nelson, 2020).

A bank is said to have a suitable liquidity situation if its pool of liquid assets is large enough to meet its liabilities. There isn't enough money available right now to fulfill its obligations, which indicates a comfortable liquidity situation. Operating risk may perform poorly as a result of limited liquidity. Therefore, the banking industry as a whole may function inefficiently and with low profitability as a result of the excessive liquidity. Long-term banking performance failure might result from it. Both a high liquidity crisis and excessive liquidity are bad for commercial banks. The level of liquidity in the economy at any given time is determined by the actions taken by the government, commercial banks, regular citizens, and the central bank. the central bank's instructions to maintain the money standard. How much cash should a commercial bank invest, how much should it keep in liquid assets, and how much should it lend out? (Bhattarai, 2016).

The conversion of assets into cash is referred to as liquidity. A sufficient amount of liquid assets that are readily sold at market value with minimal transaction costs must be maintained by commercial banks. Currency, bank balances, marketable securities, and other assets that may be quickly turned into cash are examples of liquid assets held by commercial banks. However, investing these for a while might provide interest more quickly than keeping a cash balance that is inactive. A commercial bank must assess the costs and benefits of retaining these different liquidity assets in order to decide on an optional liquid assets balance, which represents the traditional risk-return trade-off that the commercial bank must make. A careful balance between the risk and return components of cash management is necessary for effective cash management (Bhattarai, 2016).

2.1.6.4 Inflation

Bank lending has an impact on the money supply, and as a result, bank lending should have an impact on inflation. As a result, a rise in the money supply likewise raises prices and production. Although there is a relationship, it is not a direct or reciprocal one between inflation and the money supply (Poudel, 2018).

The pace at which the average price level of a chosen basket of goods and services in an economy rises over time is called inflation, and it may be quantified. Inflation, which is frequently reported as a percentage, is a measure of how much a country's currency has lost purchasing power. As prices rise, they begin to affect the average person's overall cost of living. The nation's relevant monetary authority, such as the central bank, then takes the required actions to keep inflation within acceptable bounds and maintain a healthy economy. The opposite of deflation, which denotes a general decrease in prices for goods and services when the inflation rate goes below zero percent, is inflation, which is quantified in a variety of ways depending on the sorts of products and services studied.

A steady rise in price is known as inflation. Inflation helps to some extent to encourage economic expansion. However, excessive inflation poses a threat to the economy's stability, growth, and overall health if it exceeds a certain threshold. Excessive inflation, among other things, reduces domestic financial savings, impairs external competitiveness, and skews the best use of resources and growth.

The causes of rising inflation are multifaceted. They fall into two categories: supply-side and demand-side elements. The main demand-side variables are the excessive flow of bank credit (private sector lending) to unproductive sectors, the expansion of the money supply, net foreign assets, and banking sector liquidity. From the perspective of supply, the main variables influencing inflation include changes in currency rates, structural rigidities, cartelization, syndicating, power shortages, exchange rate regimes, poor output, etc. The case in question focuses on bank lending, or credit to the private sector. The impact of bank loans on inflation is significant. There are two outcomes if private sector credit from commercial banks increases. Excessive loan flows are absorbed by production if they may be used in productive sectors like tourism, hydroelectricity, agriculture, and other industries and

productivity rises. In this instance, inflation stays the same. The price will rise if banks provide excessive credit to unproductive industries like real estate, shares, gold, and other personal spending. It is only natural for prices to rise as more people compete for limited supplies. Price increases worsen export competitiveness and reduce terms of trade, which leads to instability in the external sector (Olaoye & Fajuyagbe, 2020).

2.1.6.5 Loan Interest Rate

The amount that a lender charges a borrower for the use of assets is known as the interest rate, and it is represented as a percentage of principle. Annual percentage rates, or APRs, are commonly used to indicate interest rates. The assets that are borrowed may consist of money, consumer products, and big assets like a car or building.

Interest serves as the borrower's equivalent of a rental or leasing fee for the use of an item. The interest rate is sometimes referred to as the lease rate when it comes to a significant asset, such as a car or building. Generally, a low interest rate is applied to a borrower who is deemed low risk; a higher interest rate is applied to a borrower who is deemed high risk ((Poudel, 2018).

When it comes to loans, the principal the total amount borrowed is usually subject to the interest rate. The cost of debt for the borrower and the rate of return for the lender are represented by the interest rate. Interest rates are used in many contexts involving lending and borrowing. People take out loans to establish businesses, buy houses, finance projects, pay for college, and other purposes. Companies use loans to finance capital projects and grow by acquiring long-term and fixed assets like vehicles, buildings, machinery, and land. The borrowed funds must be returned, either in the form of monthly instalments or as a lump sum at a prearranged date. Since lenders want to be reimbursed for the time they lose out on using the money while it is being lent out they could have invested the money instead of lending it out the amount owing is typically more than the amount borrowed. If the lender had chosen to employ the enormous asset they had lent, they might have been able to make money off of it. The interest charged is the difference between the total amount repaid and

the original loan. The interest rate that is applied to the principal amount is known as the interest charged.

2.1.6.6 Deposit Interest Rate

Financial institutions pay deposit account holders the deposit interest rate. Certificates of deposit, savings accounts, and retirement accounts with self-directed deposits are examples of deposit accounts. Higher balance accounts usually get better rates from financial organizations. This serves as a lure for valuable customers with substantial assets. Naturally, the more money deposited over time will result in a larger return because to the higher interest rate. These types of accounts can provide greater stability than more volatile, high-risk financial products, even if they may still be perceived as a slower growth way to earning profits (Vaidya, 2014).

When weighed against the more erratic returns of alternative financial instruments, the fixed interest rates offered by some bank accounts are typically lower. There is a trade-off between the possibility of unexpected gains or even losses at even greater scales and the account holder's guaranteed steady growth of their deposit. For example, when an account matures, a certificate of deposit with a fixed rate is guaranteed to provide the specified return. Variable rate CD accounts are also available, but they are usually no-risk investments. Real estate, mutual funds, stocks, bonds, and notes are some of the investment options available in some self-directed retirement plans.

2.2 Empirical Review

Noman et al. (2015) examined the effect of credit risk on the banking profitability: A case on Bangladesh. The purpose of the study was to determine how credit risk affected Bangladesh's banking industry's profitability. The research employs 172 observations from 18 private commercial banks between 2003 and 2013 along with an imbalanced panel data set. The research employs ROAA, ROAE, NIM, and LLRGL as profitability indicators and NPLGL, LLRGL, LLRNPL, and CAR as credit risk indicators. The study demonstrates the significant negative and substantial impact of NPLGL and LLRGL on all profitability metrics using the OLS random effect model, GLS, and system GMM. Additionally, the data revealed that CAR had significant

adverse effects on ROAE. According to a further investigation, Basel II's adoption has a considerably beneficial impact on NIM but a significantly negative impact on ROAE. Some important policy implications for boosting profitability and safeguarding banks against crises are shown by the research.

Gijaw et al. (2015) examined the impact of credit risk on profitability performance of commercial banks in Ethiopia. The main objective of the study was to examine how credit risk affected the profitability of Ethiopian commercial banks. For this aim, secondary data from eight sample commercial banks during a 12-year period (2003–2004) were obtained from the National Bank of Ethiopia as well as the annual reports of the individual banks. Credit risk indicators including non-performing loans, loan loss provisions, and capital sufficiency have a major influence on the profitability of Ethiopian commercial banks, according to the results of an analysis of the data using a descriptive statistics and panel data regression model. The report concludes that maintaining Ethiopia's present level of profitability in commercial banks will need better credit risk management.

Alshatti (2015) analyzed the effect of credit risk management on financial performance of the Jordanian commercial banks. The main objective of the study was to examine the effect of credit risk management on financial performance of the Jordanian commercial banks. This study used correlation and multiple regression analysis to analyze the data. This study found that CAR had insignificant negative effect on ROA and ROE. Then, CICF had positive insignificant effect on ROA and ROE. Provision for facilities loss to net facilities had significant negative effect on ROA and ROE. At the meantime, Leverage ratio had significant negative effect on ROA but insignificant positive effect on ROE. Finally, NPLR had significant positive effect on ROA & ROE.

Bhattarai (2016) analyzed effect of credit risk on the performance of Nepalese commercial banks. This study has examined the effect of credit risk on performance of Nepalese commercial banks. The descriptive and causal comparative research designs have been adopted for the study. The pooled data of 14 commercial banks for the period 2010 to 2015 have been analyzed using regression model. This study revealed that capital adequacy ratio and cash reserve ratio had insignificant positive

effect on performance (ROA) whereas non-performing loan had significant negative effect on ROA. Finally, cost per loan and bank size had significant positive effect on ROA. Hence, this study concluded that there was significant relationship between credit risk indicators and bank performance.

Annor and Obeng (2017) assessed impact of credit risk management on the profitability of selected commercial banks listed on the Ghana stock exchange. The main purpose of study was to examine the impact of credit risk on profitability of commercial banks listed on the Ghana Stock exchange. Secondary data was gathered from the annual reports of the six selected banks and Ghana banking survey for the years under consideration. The study adopted the Random Effect Model within the panel estimation technique framework. This study found that NPLR and CAR had significant positive effect on ROE. At the same time, LLPR has significant negative impact on ROE. Finally, loan to assets ratio had insignificant negative impact on ROE of the banks.

Ifeanyi and Francis (2017) investigated effect of credit management on profitability of deposit money banks in Nigeria. This study investigated the relationship between Deposit Money Banks' (DMBs') profitability (ROA) and credit management in the Nigerian setting from 2006 to 2015. The Central Bank of Nigeria's Statistical Bulletins and the Annual Reports of every DMB that is currently in operation were the sources of secondary data. The multiple regression approach was used in the investigation. The analysis showed that non-performing loans had a negative and insignificant impact on profitability, while loans, advances, and loan loss provisions had a positive and small impact. Overall, the two regressions' estimates fit well and are statistically sufficient.

Shrestha (2017) examined the impact of credit risk management on profitability: Evidence from Nepalese Commercial Banks. The main objective of the study was to investigate the impact of credit risk management on profitability of Nepalese commercial banks. This study used descriptive statistics, correlation analysis some diagnostic tests for the linear regression model assumption to analyze the data. This study found that capital adequacy and assets growth ratio had significant positive effect on ROA and ROE. This study also found that NPLR and Leverage had

significant negative impact on ROA and ROE. However, cash reserve ratio had insignificant negative impact on ROA and ROE. Finally, cost per loan assets ratio had insignificant positive effect on ROA and significant positive impact on ROE.

Singh and Sharma (2018) investigated impact of credit risk on profitability: a study of Indian public sector banks. The objective of the current study was to determine how credit risk affected the bottom line of 26 public sector banks. Secondary data were gathered during a six-year period, from 2011 to 2016, including journals, websites, Reserve Bank of India reports, and Indian Banks' Association reports. The program PASW 18.0 is used to analyze data and carry out multiple regression. The findings indicate that while ROA and NPLR have a negative association, there is a strong and positive relationship between ROA and CAR, LPNPL. Return on Assets (ROA) is predicted by credit risk to be 55.7%, suggesting that CAR, NPLR, and LPNPL have a major influence on ROA. While CAR and LPNPL are not significant predictors of a bank's profitability, NPLR is the most significant credit risk indicator when it comes to predicting the profitability of the bank. For this reason, in order to minimize non-performing loans and achieve maximum profitability, banks should concentrate on credit risk management.

Poudel (2018) investigated impact of credit risk on profitability of commercial banks in Nepal. The main purpose of the study was to examine the impact of credit risk on profitability of the commercial banks in Nepal. Data were gathered from a sample of fifteen commercial banks that were active in the Nepali economy between 2002–2003 and 2014–2015. A key analytical method in panel data analysis is the one-way Fixed Effect Model (FEM). Return on equity, a metric used to assess the profitability of commercial banks, is regressed against both macroeconomic and bank-specific variables. The findings demonstrated that credit risk significantly lowers the profitability of Nepal's commercial banks. Furthermore, inflation, interest spread rates, and solvency ratios have a negligible detrimental effect on profitability. On the other hand, the GDP growth, total assets, and capital adequacy ratio significantly boost the profitability of Nepal's commercial banks. Lastly, the profitability of interbank interest rates is slightly positively impacted.

Al-Eitan and Bani-Khalid (2019) in their article entitled “Credit risk and financial performance of the Jordanian commercial banks: a panel data analysis”. This study observed the effects of credit risk (CR) from 2008 to 2017 on the financial performance of Jordanian commercial banks that are listed on the Amman Stock Exchange. The influence of CR on the performance of sixteen listed banks in Jordan is ascertained through the use of the GLS method in conjunction with a panel data analysis of both fixed and random-effect models. The findings indicated that return on equity (ROE) and return on assets (ROA) are significantly and negatively impacted by CR. Furthermore, the results showed that while total deposits and bank size have a positive and significant impact on the financial performance of these Jordanian commercial banks, CR (measured by the ratio of doubtful debts to total loans, non-performing loans, and loan losses to total loans) has a negative and significant impact on ROA and ROE.

Olaoye and Fajuyagbe (2020) assessed credit risk management and profitability of selected deposit money banks in Nigeria: panel data approach. The main objective of the study was to look at how credit risk management affected the profitability of specific Nigerian deposit money institutions. To capture the relationship between the profitability of deposit money institutions and credit risk management, the study used a single panel based model. Analytical methods for both descriptive and inferential analysis were applied to the collected data. This study found that while provision for questionable debts had a favorable and large influence on the profitability of deposit money banks in Nigeria, risk management as measured by non-performing loans had a minor negative impact.

Munangi and Sibindi (2020) analyzed the impact of credit risk on the financial performance of 18 South African banks for the period 2008 to 2018. The primary goal of the research was to assess how credit risk management affected the bottom line of particular Nigerian deposit money institutions. The study specifically examined the effects of provision for doubtful debts and non-performance loans on the return on assets of the chosen deposit money banks in Nigeria. For this investigation, panel data approaches were used, specifically the fixed effects, random effects, and pooled ordinary least squares (pooled OLS) estimators. This study found that NPLR has significant negative effect on ROA but insignificant positive effect ROE. Then, NPL

to equity ratio has insignificant positive effect on ROA but significant negative effect on ROE. Likewise, SIZE and leverage have insignificant positive effect on ROA and ROE. Finally, CAR has significant positive effect on ROA but it has insignificant negative effect on ROE.

Nelson (2020) investigated the impact of credit risk management on the profitability of BGFI Bank Congo. The main objective of the study was to look at how credit risk management affected the commercial banks' profitability in Cong.We will use MS Excel 2016 to handle the data and then go back to Eviews 9 to perform a descriptive analysis of the variables. It will be able to clarify the relationship between the credit risk and profitability metrics as a result. This study found that CAR had insignificant negative effect on ROE but significant positive effect on ROA. Then, NPLR had insignificant negative impact on ROA and ROE. At the meantime, LLPR had significant negative effect on ROE but it has insignificant negative effect on ROA. Finally, RCLSTF had insignificant positive effect on ROE but insignificant negative effect on ROA.

Al Zaidanin and Al Zaidanin (2021) in their article entitled “Impact of credit risk management on the financial performance of United Arab Emirates commercial banks” has investigate up to what extent the independent factors defined by capital adequacy ratio, non-performing loans ratio, cost-income ratio, liquidity ratio, and loans-to deposits ratio impact the financial performance of sixteen commercial banks operating in the United Arab Emirates using panel data for the period of 2013-2019. The secondary data was gathered from banks and subjected to routine descriptive statistics analysis, along with hypothesis testing using the random effect model. The results of the regression analysis indicate that the ratio of non-performing loans and the cost-income ratio significantly lower the profitability of commercial banks in the United Arab Emirates. On the other hand, the capital adequacy, liquidity, and loans-to-deposits ratios all show a weakly positive relationship with the return on assets, but their statistical impact on the ratio is insignificant, making them not significant predictors of bank profitability.

Biswas et al. (2021) analyzed effect of credit risk on commercial banks’ profitability: a case study of Bangladesh. The study examined the impact of the credit risk on the

profitability of the public and private sector banks in Bangladesh. To carry out the analysis, secondary data from the annual reports was employed. In this inquiry, multiple regression analysis was carried out. The study found a statistically significant positive link between return on assets (ROA), the cost to loan assets ratio, and the capital adequacy ratio (CAR). On the other hand, a significant negative correlation was discovered between non-performing loans (NPL), ROA, and bank size. However, there was no statistically significant association found between the cash reserve ratio and ROA. Consequently, the study concluded that bank size, non-performing loans (NPLs), and capital adequacy ratio (CAR) were the most important predictors of CB profitability among the five credit risk indicators.

Shrestha and Nirouala (2021) in their article entitled "The consequence of credit performance and capital adequacy: evidence from commercial banks in Nepal" has aimed at examining the consequence of credit performance and capital adequacy of Nepalese commercial banks. To carry out the analysis, secondary data from the annual reports was employed. In this inquiry, multiple regression analysis was carried out. The study found a statistically significant positive link between return on assets (ROA), the cost to loan assets ratio, and the capital adequacy ratio (CAR). On the other hand, a significant negative correlation was discovered between non-performing loans (NPL), ROA, and bank size. However, there was no statistically significant association found between the cash reserve ratio and ROA. Consequently, the study concluded that bank size, non-performing loans (NPLs), and capital adequacy ratio (CAR) were the most important predictors of CB profitability among the five credit risk indicators.

Chhetri (2021) in his article entitled "Effect of credit risk management on financial performance of Nepalese commercial banks" has investigated the effect of credit risk on the financial performance of commercial banks in Nepal. Researchers have examined panel data with eighty-five observations from 2015 to 2020 from seventeen commercial banks. The regression model (ROA) indicates that non-performing loans (NPLR) have a statistically significant negative impact on financial performance.The financial performance (ROA) is negatively and statistically insignificantly impacted by the bank size (BS) and the capital adequacy ratio (CAR). The study discovered that while credit to deposit (CDR) has a positive but no significant link with ROA, the

management quality ratio (MQR) has a positive and significant correlation with the financial performance (ROA) of the commercial banks in Nepal. This will help to reduce the high incidence of non-performing loans and their detrimental effects on financial performance.

Kawor and Atinyo (2022) in their article entitled “The link between credit risk and profitability of universal banks in Ghana” has assessed the relationship between credit risk and profitability of universal banks in Ghana, employing annual data for the period 2011 – 2020 from 22 universal banks selected using the criterion sampling technique. The relationship between credit risk and profitability was estimated using the Ordinary Least Squares (OLS). Return on assets (ROA) was used to assess profitability, while nonperforming loans to loans and advances (NP/LA), loans and advances to total deposits (LA/TD), and provision for loan loss to net loans (PLL/NL) were used as proxies for credit risk. The results showed that whereas NP/LA and LA/TD had significant positive effects on ROA, PLL/NL had a negative connection with ROA. Overall, the findings demonstrated that credit risk affects the profitability of businesses. Because of this, the management of the universal banks in Ghana needs to be proactive in lowering the risks related to credit risk.

Dunyoh et al. (2022) examined the impact of credit risk on financial performance: evidence from rural and community banks in Ghana. The study examined at how credit risk affected Ghanaian community and rural banks' bottom lines. The study used Ghanaian community and rural banks' annual reports from 2014 to 2018. Ten (10) community and rural banks, whose financial records were accessible for the duration of the study, were used in the research. The annual reports of the community and rural banks provided the secondary data for the analysis. STATA version 13 was used to analyze the data. The results indicated a negative correlation between the two credit risk indicators and financial performance metrics. The study came to the conclusion that credit risk was a factor that affected the financial performance of rural and community banks, that credit risk was growing over time, and that credit risk would continue to do so in the future.

Yeasin (2022) investigated impact of credit risk management on financial performance: a study of commercial banks in Bangladesh. The purpose of the study

was to examine how credit risk management affects commercial banks' financial results. The study used a deductive research approach and targeted six commercial banks in Bangladesh. Panel regression analysis was used to analyze secondary data from 2010 to 2019 for all of the data. Panel data regression study revealed that the Capital Adequacy Ratio (CAR) and Non-performing Loan (NPL) had a statistically significant negative influence on the financial performance of commercial banks. On the other hand, the Loan to Deposit Ratio (LDR) positively and statistically significantly affected the commercial banks' financial performance. As a result, credit risk has a detrimental impact on commercial banks' financial performance.

Shrestha (2022) analyzed effect of credit risk on profitability of Nepalese commercial banks. This study examined the effect of credit risk on profitability of Nepalese commercial banks. The ratios of total loan to total deposit (TL/TD), cash reserve ratio (CRR), nonperforming loan to total loan (NPL/TL), and loan loss provision to total loan (LLP/TL) are used to quantify credit risk, while return on assets (ROA) is used to measure profitability. For the analysis, the yearly data of eighteen commercial banks from 2013–14 to 2018–19 were considered. This study indicates that credit risk has a considerable impact on the profitability of Nepalese commercial banks using the Fixed Effect model. Ultimately, it is found that the profitability of Nepalese commercial banks is significantly impacted by TL/TD in a positive way and significantly negatively by NPL/TL and LLP/TL. In order to boost the profitability of Nepalese commercial banks, the bank management should raise the ratio of total loan to total deposit and decrease the ratio of nonperforming loan to total loan and loan loss provision to total loan.

Butola, Dube and Jain (2023) in their article entitled “Impact of credit risk management on the profitability of Indian Banks”. The main objective of this research was to establish a statistical relationship between Indian banks' profitability and credit risk management, or CRM. Researchers gathered secondary data from 38 scheduled commercial banks in India and used panel data regression to analyze it. Return on assets is regarded as a dependent variable and a measure of profitability for the purposes of this study, whereas the credit to deposit ratio, net interest margin, operating profits to total assets, capital adequacy ratio, provision coverage ratio, and net non-performing assets to net advances are categorized as independent variables

and are thought to be the factors that determine CRM. The profit rate (ROA) has a positive association with the CDR, OPA, and CAR, but a negative correlation with NIM, NNPA, and PCR with the exception of PCR, which also exhibits a statistically significant correlation according to the statistical data.

Table 1

Summary of Empirical Review

S. N.	Author/Date	Topic	Objectives	Methodology	Major Findings
1	Noman, Pervin, Chowdhury and Banna (2015)	The effect of credit risk on the banking profitability: A case on Bangladesh.	The study aimed to find the effect of credit risk on profitability of the banking sectors of Bangladesh.	The study used OLS random effect model, GLS, and system GMM.	This study found that NPL to loan had significant positive impact on profitability (ROA & ROE). Then, LLP to loan has insignificant negative effect on ROA but significant negative effect on ROE. At the meantime, LLP to NPL has insignificant positive influence on ROA & ROE. Finally, CAR has insignificant positive impact on ROA but significant negative impact on ROE.
2	Gijaw, Kebede and Selveraj (2015)	The impact of credit risk on profitability performance of commercial banks in Ethiopia.	The main objective of the study to examine the impact of credit risk on profitability of commercial banks in Ethiopia.	The data were analyzed using a descriptive statics and panel data regression model	NPLR has significant negative effect on ROA and ROE and CAR has positive insignificant impact on ROA but significant negative impact on ROE. Then, loan and advance ratio has insignificant positive impact on ROA and ROE. Finally, LLPR has significant positive impact on ROA and ROE.
3	Alshatti (2015)	The Effect of Credit Risk Management on Financial Performance of the Jordanian Commercial Banks.	To examine the effect of credit risk management on financial performance of the Jordanian commercial banks.	This study used correlation and multiple regression analysis to analyze the data.	This study found that CAR has insignificant negative effect on ROA and ROE. Then, CICF has positive insignificant effect on ROA and ROE. Provision for facilities loss to net facilities has significant negative effect on ROA and ROE. At the meantime, Leverage ratio significant negative effect on ROA but insignificant positive effect on ROE. Finally, NPLR has significant positive effect on ROA & ROE.
4	Bhattarai (2016)	Effect of credit risk on	This study has examined	This study used correlation and	This study revealed that capital adequacy ratio and cash

		the performance of Nepalese commercial banks.	the effect of credit risk on performance of Nepalese commercial banks.	multiple regression analysis to analyze the data.	reserve ratio had insignificant positive effect on performance (ROA) whereas non-performing loan had significant negative effect on ROA. Finally, cost per loan and bank size had significant positive effect on ROA.
5	Shrestha (2017)	The impact of credit risk management on profitability: Evidence from Nepalese Commercial Banks.	This study examined the impact of credit risk management on profitability of Nepalese commercial banks.	Some diagnostic tests for the linear regression model assumption were provided, along with descriptive statistics and correlation analysis	This study shows that CAR and AGR have significant positive effect on ROA and ROE. NPLR and leverage had significant negative impact on ROA and ROE. However, CRR has insignificant negative impact on ROA and ROE. Finally, CPLA has insignificant positive effect on ROA and significant positive impact on ROE.
6	Annor and Obeng, (2017)	Impact of credit risk management on the profitability of selected commercial banks listed on the Ghana stock exchange.	This study examined the effect of commercial bank lending on inflation in Nepal.	Within the framework of panel estimation technique, the Random Effect Model was employed by the study.	The results demonstrated that there is, in fact, a substantial correlation between bank profitability and credit risk management. A bank's profitability was positively correlated with its capital adequacy ratio; nevertheless, there was a statistically significant negative correlation between a bank's profitability and its loan to asset ratio, non-performing loan ratio, and loan loss provisions ratio.
7	Ifeanyi and Francis (2017)	Effect of Credit Management on Profitability of Deposit Money Banks in Nigeria.	This study examined the nexus between credit management and profitability (ROA) of Deposit Money Banks (DMBs) in Nigeria context for	The study used multiple regression analysis to analyze the data.	The study found that while non-performing loans have a negative and negligible impact on profitability, loans, advances, and loan loss provisions have a positive and small impact. Overall, the two regressions' estimates fit well and are statistically sufficient.

			the period of 2006 to 2015.		
8	Singh and Sharma (2018)	Impact of credit risk on profitability: a study of Indian public sector banks.	The present study was conducted to examine the impact of credit risk on profitability of twenty six public sector banks.	The software PASW 18.0 is used to analyze data and carry out multiple regression.	The results show that although ROA and NPLR are negatively correlated, ROA and CAR, LPNPL are positively correlated. CAR, NPLR, and LPNPL have a significant impact on ROA. NPLR is the most important credit risk indicator when it comes to forecasting a bank's profitability, while CAR and LPNPL are not very good indicators.
9	Poudel (2018)	Impact of credit risk on profitability of commercial banks in Nepal.	The main purpose of the study was to examine the impact of credit risk on profitability of the commercial banks in Nepal.	A key analytical method in panel data analysis is the one-way Fixed Effect Model (FEM).	The results confirmed that credit risk has the significant negative impact on profitability of commercial banks in Nepal. In addition, solvency ratio, interest spread rate, and inflation have the insignificant negative impact on profitability. In contrast, capital adequacy ratio, total assets, and GDP growth have the significant positive impact on profitability of commercial banks in Nepal.
10	Al-Eitan and Bani-Khalid (2019)	Credit risk and financial performance of the Jordanian commercial banks: A panel data analysis.	This study examined the impact of credit risk (CR) on the financial performance of Jordanian commercial banks listed in Amman Stock Exchange, for the period 2008-2017.	This study used of the GLS method in conjunction with a panel data analysis of both fixed and random-effect models	The findings indicated that return on equity (ROE) and return on assets (ROA) are significantly and negatively impacted by CR. Furthermore, the results showed that while total deposits and bank size have a positive and significant impact on the financial performance of these Jordanian commercial banks, CR (measured by the ratio of doubtful debts to total loans, non-performing loans, and loan losses to total loans) has a negative and significant impact on ROA and ROE.
11	Olaoye and Fajuyagbe (2020)	Credit risk management and profitability of selected deposit money	The study investigated effects of credit risk management on the profitability	Analytical methods for both descriptive and inferential analysis were applied to the collected data.	This study found that while provision for questionable debts had a favorable and large influence on the profitability of deposit money banks in Nigeria, risk management as

		banks in Nigeria: Panel data approach.	of selected deposit money banks in Nigeria.		measured by non-performing loans had a minor negative impact.
12	Munangi and Sibindi (2020)	An empirical analysis of the impact of credit risk on the financial performance of South African banks.	The study investigated effects of credit risk management on the profitability of selected deposit money banks in Nigeria.	This study used multiple regression analysis to analyze the data.	This study found that NPLR has significant negative effect on ROA but insignificant positive effect ROE. Then, NPL to equity ratio has insignificant positive effect on ROA but significant negative effect on ROE. Likewise, SIZE and leverage have insignificant positive effect on ROA and ROE. Finally, CAR has significant positive effect on ROA but it has insignificant negative effect on ROE.
13	Nelson (2020)	The Effects of Non-performing Loans on Dynamic Network Bank Performance.	The main purpose of the study is to analyze credit risk indicators and profitability measurement ratios over the period of 2010-2019.	This study used descriptive statistic, correlation and multiple regression analysis to analyze the data.	This study found The non-performing loan ratio (NPLR), the capital assets ratio (CAR), and the loan loss provision ratio (LLPR) all have a negative effect on ROE. While all three ratios have negative impacts, the CAR positively contributes to return on assets (ROA) and the ratio of client loans and short-term financing (RCLSTF) to return on equity (ROE).
14	Al Zaidanin and Al Zaidanin (2021)	The impact of credit risk management on the financial performance of United Arab Emirates commercial banks.	This study analyzed the effect of credit risk management on the financial performance of banks.	This study applied descriptive statistics analysis, along with hypothesis testing using the random effect model	This study found that non-performing loan and cost income ratio had significant negative effect on financial performance (ROA). Similarly, capital adequacy ratio, liquidity ratio and loan to deposit ratio had significant positive effect on ROA.
15	Biswas, Nath, Biswas and Rashid (2021)	Effect of credit risk on commercial banks' profitability: A case study of Bangladesh.	The main purpose of the study was to examine the impact of the credit risk on the profitability	In this inquiry, multiple regression analysis was carried out.	This study revealed that non-performing loan ratio and bank size had significant negative effect on profitability. Then, capital adequacy ratio and cost to loan assets had significant positive effect on ROA. Finally, cash reserve

			of the public and private sector banks in Bangladesh.		ratio had insignificant positive effect on profitability of commercial banks in Bangladesh.
16	Chhetri (2021)	Effect of credit risk management on financial performance of Nepalese commercial banks.	The main purpose of this study was to investigate the effect of credit risk on the financial performance of commercial banks in Nepal.	This study used descriptive, correlation and multiple regression analysis.	This study revealed that NPLR has significant negative effect on profitability (ROA). CAR and bank size have insignificant negative effect on ROA. Moreover, CDR has insignificant positive effect on ROA and MQR has significant negative effect on ROA.
17	Shrestha and Nirouala (2021)	The consequence of credit performance and capital adequacy: Evidence from commercial banks in Nepal.	This study aims at examining the consequence of credit performance and capital adequacy of Nepalese commercial banks	In this inquiry, multiple regression analysis was carried out.	This study found that CDR and NPLR have significant negative effect on profitability (ROA) and IRS has positive significant effect on ROA. Moreover, CAR has insignificant negative effect on ROA.
18	Kawor and Atinyo (2022)	The link between credit risk and profitability of Universal banks in Ghana.	The main objective of the study was to examine the relationship between credit risk and profitability.	This study used ordinary least squares to analyze the data.	This study revealed that non-performing loan and loan to deposit ratio had significant positive effect on profitability (ROA). Moreover, provision for loan loss to net loans had insignificant negative effect on profitability.
19	Dunyoh, Ankamah and Kosipa (2022)	The impact of credit risk on financial performance: Evidence from rural and community banks in Ghana.	The study examined the impact of credit risk on financial performance of rural and community banks in Ghana.	This study used correlation and multiple regression analysis to analyze the data.	The results indicated a negative correlation between the two credit risk indicators and financial performance metrics. The study came to the conclusion that credit risk was a factor that affected the financial performance of rural and community banks, that credit risk was growing over time, and that credit risk would continue to do so in the future.
20	Yeasin	Impact of	The study	This study used	NPLR has significant negative

	(2022)	credit risk management on financial performance: A study of commercial banks in Bangladesh.	aimed to analyze the impact of credit risk management on financial performance of commercial banks.	descriptive and multiple regression analysis.	effect on ROA. However, CAR has insignificant negative effect on financial performance (ROA). Moreover, Loan to deposit ratio has insignificant positive effect on performance (ROA).
21	Shrestha (2022)	Effect of credit risk on profitability of Nepalese commercial banks.	This study examined the effect of credit risk on profitability of Nepalese commercial banks	This study used the Fixed Effect model to analyze the data.	This study found that TL/TD has significant positive effect on profitability (ROA). NPL/TL and LLP/TL have significant negative effect on ROA. Moreover, CRR and SIZE have insignificant negative effect on profitability (ROA).
22	Butola, Dube and Jain (2023)	A study on impact of credit risk management on the profitability of Indian Banks.	The main aim of this study was to find a statistical association between credit risk management (CRM) and profitability within Indian banks.	This study used panel data multiple regression analysis to analyze the data.	This study found that the CDR, OPA and CAR are all positively related to the profit rate (ROA) while NIM, NNPA and PCR all found to be negatively related to the profit rate (ROA) and statistically show a significant association except PCR.

2.3 Research Gap

It refers to the study gap related to previous studies. Previously, various research studies were made regarding liquidity and profitability of different banks by different students, experts and researcher. However, the limited findings, extensive testing and adjustment in necessary variables limits result of previous study. Since those studies have limitation on their research, a new research study was required and validating.

The purpose of this research work and previous studies is quite different. Firstly, the studies of credit risk and profitability of banks were made on different period. They had only studies the credit risk management and profitability of banks on old periods. It became necessary to do new research study on effect of credit risk on profitability

of recent periods up to FY 2022/23. Similarly, the effect of credit risk on profitability of five commercial banks was not available on previous studies. To overcome this lacking, a new research study was required to evaluate in this topic of these banks. Moreover, this study is also different with previous studies in explanatory variables such as cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio and bank size and dependent variable i.e. profitability (ROA and ROE) to analyze the effect of credit management on profitability of commercial banks in Nepal. Moreover, this study includes different tools of descriptive analysis, correlation analysis, and regression analysis as specific tools which were not included in previous studies. This study will provide the clear conceptual idea and knowledge of credit risk. Therefore, this study has tried to fulfill the research gap.

CHAPTER - III
RESEARCH METHODOLOGY

3.1 Research Design

This study follows descriptive and causal research design. Descriptive research used in the study supports to analyze the credit risk management and profitability position of the commercial banks and find out the recent position of the banks through average value, standard deviation, maximum and minimum which describe the characteristics of data of commercial banks and causal research design supports to analyze the effect of credit risk management on profitability of commercial banks in the study.

3.2 Population and Sample, and Sampling Design

At present, there are 20 commercial banks operating in Nepal (Till July, 2023). They constitute the population. Among of them, five commercial banks i.e. NABIL, SBI, EBL, SCB and NBL are selected as sample for the study of credit risk on the basis of judgment or purposive sampling method. In this present situation, these five banks are top five in profitability. Moreover, these commercial banks are getting success in competitive market form respective way by managing credit risk because credit is the major function of every commercial bank. Therefore, the researcher has chosen these five banks.

3.3 Nature and Sources of Data, and Instrument of Data Collection

Secondary data for this study were obtained from linked offices' webpages and yearly reports. Secondary data are those that have previously been gathered or utilized by another party and are made public in the form of statistics. Therefore, the primary sources and data kinds are these published sources, which include books, journals, papers, and the annual reports of the commercial banks. They also contain numerous theses connected to this subject and NRB reports.

3.4 Method of Analysis

Descriptive analysis, correlation analysis, and multiple regressions are used in this study to investigate how credit risk management affects the profitability of Nepalese commercial banks as determined by credit characteristics.

3.4.1 Descriptive Analysis

Mean ($\bar{X}$)

The arithmetic average of a variable is the best value that represents the group as a whole. The mean of loans and advances, total deposit, current ratio, interest rate spread, and inflation rate are all determined using it. It is calculated as:

$$\text{Mean } (\bar{X}) = \frac{\Sigma X}{n}$$

Where,

ΣX = Sum of given Observation

n = No. of Observation

Standard Deviation

Since the standard deviation met the majority of the requirements for a good measure of dispersion, it is the absolute measure of dispersion in which the flaw found in other measures of dispersion is present. Greater standard deviation The variability will be higher and vice versa. Dispersion quantifies how much the data deviate from the central value. Put differently, it is beneficial to examine the data's quality in terms of its variability. It is used to determine the standard deviation of all computed ratios, including the interest rate spread, inflation rate, loans and advances, total deposit, and current ratio. It is computed as follows:

$$\text{Standard Deviation (S.D.)} = \sqrt{\frac{\Sigma(X - \bar{X})^2}{n}}$$

3.4.2 Correlation Analysis

The relationship between an independent variable and another independent variable is known as the correlation coefficient. It is a technique for ascertaining how these two variables are related to one another. A variable is said to have a correlation coefficient if the two are so connected that changes in one variable's value are caused by changes in the value of another.

$$\text{Correlation Coefficient (r)} = \frac{n\Sigma XY - \Sigma X \Sigma Y}{\sqrt{n\Sigma X^2 - (\Sigma X)^2}\sqrt{n\Sigma Y^2 - (\Sigma Y)^2}}$$

Where,

r = coefficient of correlation

ΣXY = Sum of product of two series.

ΣX^2 = Sum of squared in X series

ΣY^2 = Sum of squared in Y series

n = number of years

The value of this coefficient can never be more than + 1 or less than -1. Thus, + 1 and -1 are the limit of this coefficient. The value of r = + 1 implies the correlation between variables is positive and vice- versa. And zero denoted no correlation.

3.4.3 Multiple Regressions Analysis

Multiple linear regression seeks to forecast the relationship between two or more explanatory factors and a response variable by fitting a linear equation to observed data. Every value of the independent variable x corresponds to a value in the dependent variable y. On this regression analysis, banks profitability variables (dependent) return on assets (ROA) and return on equity (ROE) is tested for their relationship with explanatory variables. The explanatory variables are independent variables, which are taken from bank specific (internal) factors such as cash reserve ratio (CRR), non-performing loan ratio (NPLR), credit to deposit ratio (CDR), leverage ratio (LEV), bank size (SIZE). Therefore, the following model has been employed for the study of relationship and effect of the study variables.

Model 1: $ROA_{it} = \beta_0 + \beta_1 CRR_{it} + \beta_2 CDR_{it} + \beta_3 NPLR_{it} + \beta_4 LEV_{it} + \beta_5 SIZE_{it} + e_{it}$ (1)

Model 2: $ROE_{it} = \beta_0 + \beta_1 CRR_{it} + \beta_2 CDR_{it} + \beta_3 NPLR_{it} + \beta_4 LEV_{it} + \beta_5 SIZE_{it} + e_{it}$ (2)

Where:

ROA_{it} = Return on assets of bank i^{th} for the time period t

ROE_{it} = Return on equity of bank i^{th} for the time period t

$NPLR_{it}$ = Non-performing ratio of bank i^{th} for the time period t

CRR_{it} = Cash reserve ratio of bank i^{th} for the time period t

CDR_{it} = Credit to deposit ratio of bank i^{th} for the time period t

$LEV_i t$ = Interest spread ratio of bank i^{th} for time period t

$SIZE_{it}$ = Bank size i^{th} for the time period t

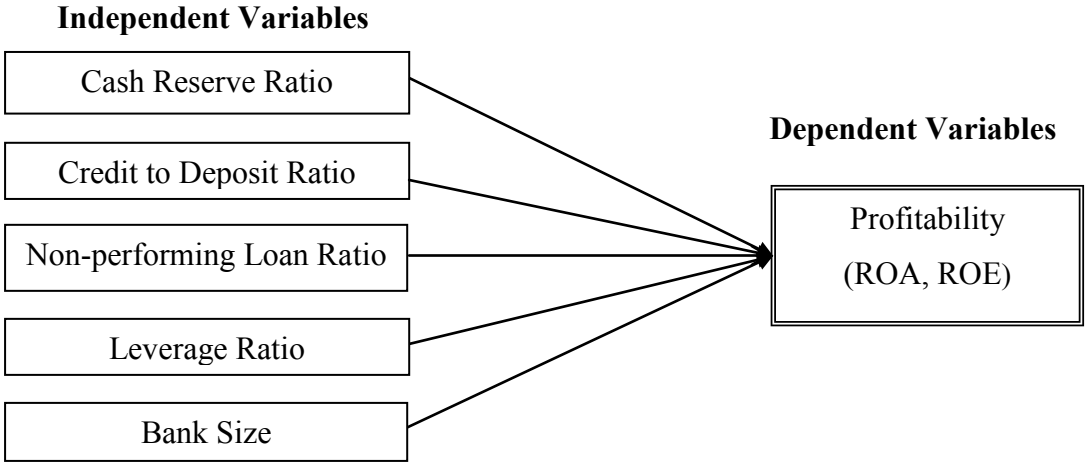
β_0 = The intercept (constant)

β_1, β_2, β_3, β_4 β_5 = Regression coefficient of independent variables.

e = error component.

3.5 Research Framework and Definition of Variables

The researcher develops the following conceptual framework for the study based on reviews of the theoretical and empirical literature.



Source: Gijaw et al. (2015); Bhattarai (2016); Poudel (2018); Munangi and Sibindi (2020); Shrestha and Nirouala (2021) and Biswas et al. (2021)

Figure 1 Research Framework of the Study

Dependent Variables

Return on assets (ROA)

Previous research on the relationship between credit risk and bank performance revealed that return on assets (ROA) was a crucial metric for evaluating banks' financial success (Shrestha, 2022). It measures how effectively bank managers are leveraging the actual investment resources of the bank to create profit. It is defined as profit after tax divided by total asset. It displays the profit per dollar of assets and, more significantly, illustrates the management's capacity to make profitable use of the bank's actual investment and financial resources. Any bank's return on assets (ROA) is determined by its policy decisions as well as by uncontrolled elements like the state of the economy and governmental laws. It demonstrates how well assets are managed to produce profits. Net profit after taxes is divided by total assets to get this ratio.

$$\text{Return on Assets (ROA)} = \frac{\text{Net profit After Tax}}{\text{Total Assets}}$$

Return on equity (ROE)

The return on equity (ROE) ratio is the most commonly utilized internal performance metric of shareholder value. Return on equity is the amount distributed to

shareholders as a return on their equity. Poudel (2018) states that return on equity is a measure of a company's profitability that illustrates how much money it produces with the capital that shareholders have contributed. The percentage of stockholder equity that represents the amount of net income returned. The net income for the entire fiscal year is calculated after distributions to preferred shares and before dividends paid to common stockholders. Net profit after taxes is divided by the average total shareholder equity fund to arrive at this percentage.

$$\text{Return on Equity (ROE)} = \frac{\text{Net profit After Tax}}{\text{Shareholders equity}}$$

Independent Variables

Cash reserve ratio

The cash reserve ratio is one of the control variables used to investigate the relationship between credit risk and banks' performance. The cash reserve ratio, or CRR, is the minimum proportion of all customer deposits that commercial banks must hold as reserves with the central bank. By changing the CRR, the central bank may control the amount of liquidity. Since raising the reserve requirement would essentially reduce the amount of capital in the economy, banks will have less money to lend out, which will reduce the money supply. It would limit the amount of money available for expenditure and investment, which would impede economic expansion. Additionally, banks would receive lower interest rates and could see a drop in profitability as a result. Furthermore, the necessity for cash reserves generates no revenue for commercial banks; as a result, it could be said to constitute a drain on bank profitability. Bhattarai (2016) discovered a negligible beneficial impact of the cash reserve ratio on ROA.

$$\text{Cash reserve ratio (CRR)} = \frac{\text{Cash and Bank Balance}}{\text{Total Deposit}}$$

Credit to deposit ratio (CDR)

CDR As its name suggests, the loan to deposit ratio is calculated by dividing the entire amount of loans and advances by the total amount of deposits. In order to continue its regular business activities, a lending institution that takes deposits has to maintain a particular level of liquidity. Most of the loans it makes to its clients aren't regarded as liquid, therefore they're investments that take longer to mature. In

addition to maintaining the required minimum level of reserves, banks may decide to allocate a portion of their non-lending assets to short-term securities in order to provide prompt access to any necessary funds. The ratio of loans and advances to total deposits (CDR) is one way to gauge credit risk. The quantity that goes out (loans) and the amount that comes in (deposits) makes a difference for banks. The bank borrows money at a higher interest rate as long as it is utilized to secure debtors. The bank's obligation (debt) to the depositors is represented by the deposits. Therefore, a healthy bank has a lot of safe loans that bring in a lot of money (interest) to cover depositor accounts (Shrestha, 2022).

$$\text{Credit to Deposit Ratio (CDR)} = \frac{\text{Loan \& Advance}}{\text{Total Deposit}} \times 100$$

Non-performing loan ratio

The non-performing loan ratio (NPLR), one of several indicators of credit risk and financial stability, is extremely important since a rise in NPLR is seen to indicate a bank's credit policy failure, lower bank revenues, and a major contributing factor to the financial crisis. Since NPLR shows the ratio of nonperforming loans to the overall loan portfolio, it is also seen as a gauge of how banks handle their credit evaluation (Bhattarai, 2016). If the borrower is still making payments on the loan, the term "nonperforming loan" is more commonly used to describe late payments than default. That being said, there is very little prospect of a debt being fully returned if it becomes non-performing.

$$\text{Non-performing Loan Ratio} = \frac{\text{Non-performing Loan}}{\text{Loan and Advance}} \times 100$$

Leverage ratio

A leverage ratio is any of a number of financial metrics that examine the amount of capital that is in the form of debt (loans) or evaluate a company's capacity to pay its debts. The debt-to-equity ratio, a measure of leverage, shows how much of a company's assets are financed by debt as opposed to equity. Businesses that raise money through debt must pay interest on a monthly basis; if a company uses debt more frequently, it will have to pay greater interest, which will reduce the earnings available to equity owners. Therefore, companies with less debt are typically

preferred by investors. Shrestha (2017) found that the leverage ratio negatively contributes to banks' profitability.

$$\text{Leverage Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}} \times 100$$

Bank size (SIZE)

The natural logarithm of total assets is the bank's size. Because it affects the bank's performance, bank size has been included as a bank-specific internal independent variable in this study. Poudel (2018) found that bank size had a detrimental impact on performance. The writers make the point that managing a bank becomes more challenging the larger it is. Bhattarai (2016), on the other hand, discovered that bank size had a favorable effect on performance. The study's findings indicate that having a large bank lowers expenses because of the economies of scale that come with it. Big banks can also obtain capital more cheaply.

CHAPTER IV
RESULTS AND DISCUSION

The empirical results of the research are presented in this chapter. The descriptive analysis opens the chapter, which is followed by a description of the pooled regression analysis and the panel data analysis findings. After the approach and data description were discussed in chapter three, secondary data for every variable in the research were gathered for Nepalese commercial banks between 2013/14 and 2022/23. First, descriptive statistics are computed to determine the dataset's nature. Additionally, panel data analysis is done to examine the different hypotheses proposed for this investigation. The parts that follow include a discussion of the test results.

4.1 Results

4.1.1 Descriptive Statistics of Variables

Table 2 presents the descriptive statistics for the variables utilized in the investigation. The outcome demonstrates the lowest and greatest performance measures for Nepalese commercial banks in terms of the profitability indices ROA and ROE, as well as other independent variables.

Table 2

Descriptive Statistics of Variable of Banks

Variables	N	Minimum	Maximum	Mean	Std. Deviation
CRR	50	4.10	30.23	12.6334	6.29636
CDR	50	48.32	94.23	76.3620	10.73734
NPLR	50	.10	5.40	1.1628	1.26414
LEV	50	4.86	22.30	8.8606	3.51504
LSIZE	50	4.73	5.68	5.1241	.21894
ROA	50	.55	2.79	1.7028	.57276
ROE	50	6.25	42.94	16.3766	7.09590

Source: Appendix –II

Table 2 shows the descriptive statistics of dependent and independent variables used in the study. The first independent variable is the cash reserve ratio, which had an average of 12.6334 percent during the course of the research, a standard deviation of 6.29636 percent, a maximum of 30.23 percent, and a minimum of positive 4.10

percent. Similarly, the ratio of credit to deposit, the second independent variable, exhibits variation ranging from 48.32 percent to 94.23 percent, with an average of 76.3620 percent and a standard deviation of 10.73734. The non-performing loan ratio, which is the third independent variable, has a standard deviation of 1.26414 and an average of 1.1628 percent, ranging from a minimum of 0.10 percent to a maximum of 5.40 percent. It is the primary credit risk indicator. It is intended to indicate that sample banks are operating at peak efficiency or are flawlessly managing their non-performing loans (NPLs), indicating minimal credit risk due to the average NPL of less than 5 percent. Commercial banks also have sound credit policies.

The leverage ratio varied at the same time, from 4.86 to 22.30 percent. Then, with a low standard deviation of 3.51504, the average leverage ratio is 8.8606 percent. The control variable, which is the total assets or bank size, has a mean of 5.1241 and a standard deviation of 0.21894. Its range is 4.73 to 5.68. According to ROA, the maximum return on assets is 2.79 percent, the minimum is 0.55 percent, and the average return on assets for the research period is 1.7028 percent with a standard deviation of 0.57276 percent. With a standard deviation of 7.09590, the ROE mean is 16.3766 ranges from a minimum of 6.25 percent to a maximum of 42.94 percent.

4.1.2 Correlation Analysis

This study attempted to determine the fundamental relationship between the dependent variable, "profitability," and the independent variables, cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio, and bank size. The many variables listed above were examined and noted. A correlation value of 0 signifies the absence of a linear relationship between the two variables. The correlation coefficient between two variables goes from +1, which represents a perfect positive link, to -1, which represents a perfect negative relationship. In Table 3, the correlation matrix is displayed as follows.

Table 3

Pearson Correlation Coefficients of Study Variables

	CRR	CDR	NPLR	LEV	LSIZE	ROA	ROE
CRR	1						
CDR	-.208	1					
NPLR	-.179	-.161	1				
LEV	.339*	-.417**	.436**	1			
LSIZE	-.332*	.687**	.180	-.351*	1		
ROA	.156	.283*	-.117	-.206	-.412**	1	
ROE	.445**	.465**	-.128	.444**	-.527**	.721**	1

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

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

Source: Appendix-III

Table 3 reveals the correlation test between both dependent and independent variables using correlation coefficient matrix. The correlation test shows that cash reserve ratio (CRR) has insignificant positive relation with ROA in 5 percent level of significance. At the same time, cash reserve ratio (CRR) has significant positive relation with ROE. Likewise, there is significant positive correlation between credit to deposit ratio (CDR) and ROA and also significant positive relationship between credit to deposit ratio (CDR) and ROE. However, there is insignificant negative correlation between non-performing loan ratio (NPLR) and ROA and also insignificant negative relationship between NPLR and ROE at 5 percent level of significance. Then, leverage ratio (LEV) has insignificant negative relationship with ROA but significant positive relationship with ROE. Finally, bank size has significant negative relationship with ROA and ROE of the banks.

4.1.3 Regression Analysis

Multiple regression analysis helps to understand how the variable moves relative to other variables. It includes a range of modeling and analysis techniques for analyzing the relationship between a dependent variable (ROA and ROE) and independent factors (cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio, and bank size).

Table 4

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.619[a]	.384	.314	.47456

a. Predictors: (Constant), LSIZE, NPLR, CRR, LEV, CDR

Source: Appendix-IV

The R square is 0.384. This means that the independent variables (LSIZE, NPLR, CRR, LEV and CDR) explain 38.40 percent of the variation or changes in the dependent variable (ROA). The R value in this study, which is 0.619, shows that the study variables have a high association with one another. This suggests that the independent factors had a significant impact on the ROA. Regression analysis is perfectly correlated with standard error of estimate.

Table 5

Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.166	5	1.233	5.476	.001[b]
	Residual	9.909	44	.225		
	Total	16.075	49			

a. Dependent Variable: ROA

b. Predictors: (Constant), LSIZE, NPLR, CRR, LEV, CDR

Source: Appendix- IV

An analysis using ANOVA (F-value) suggests that the impact of dependent variables can be explained by the greatest number of potential combinations of predictor variables. Findings indicate that the ROA indicator has a major impact. The F-values of 5.476 ($p = 0.001 < 0.05$) for the ROA proxy variables LSIZE, NPLR, CRR, LEV, CDR indicate a strong statistical correlation between the dependent variable (ROA) and the independent variables.

Table 6

Regression Coefficient of Independent Variables with ROA

Variables	Coefficients	t-statistics	p-value	VIF
(Constant)	10.131	4.664	.000	
CRR	.020	1.601	.116	1.342
CDR	.003	-.349	.729	2.259
NPLR	-.132	1.836	.073	1.804
LEV	-.103	-3.883	.000	1.903
LSIZE	-1.496	-3.033	.004	2.538

Source: Appendix-IV

Table 6 presents the regression coefficient of independent variables cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio and bank size of sample banks and the intercept value of dependent variable ROA. It shows that variance inflation factors (VIF) is below 10 of all independent variables. That's why, there is no multicollinearity in the model.

The cash reserve ratio (CRR) and ROA have a positive association, according to the regression model's results, with a coefficient estimate of 0.020. This indicates that, provided other factors remain constant, a one percent rise in the cash reserve ratio results in a 0.020 percent increase in the banks' return on assets (ROA). The p value of 0.116 indicates that this relationship is statistically insignificant at the five percent significance level. This indicates that the cash reserve ratio has an insignificant positive effect on ROA of the sample banks.

The credit to deposit ratio (CDR), with a coefficient estimate of 0.003, shows a positive correlation with ROA in the regression result. This indicates that when the credit to deposit ratio (CDR) increases by one percent while keeping other independent variables constant, the banks' return on assets (ROA) increases by 0.003 percent. The CDR's p value of 0.729 indicates that it is statistically insignificant at the five percent significance level. Therefore, the ROA of the sample banks is insignificantly positively impacted by the credit to deposit ratio (CDR).

The non-performing loan ratio (NPLR) and return on assets (ROA) have a negative correlation, as indicated by the regression's coefficient estimate of -0.132. This indicates that when the non-performing loan ratio (NPLR) increases by one percent while keeping other independent variables constant, the banks' return on assets (ROA)

decreases by -0.132 percent. The NPLR's p value of 0.073 indicates that it is statistically insignificant at the five percent significance level. The working hypothesis that the non-performing loan ratio (NPLR) has a statistically insignificant negative impact on the ROA of the sample banks.

Leverage ratio (LEV) and ROA have a negative association, according to the regression result, with a coefficient estimate of -0.103. This indicates that, while all independent variables are held constant, a one percent rise in the leverage ratio results in a -0.103 percent decline in the banks' return on assets (ROA). The leverage ratio's p value of 0.000 indicates that it is statistically significant at the five percent significance level. Leverage ratio therefore has a statistically significant negative impact on return on assets (ROA) of the banks.

The results of the regression model show that bank size (LogSize) and ROA have a negative connection, with a coefficient estimate of -1.496. This demonstrates that, when all other independent variables are held constant, a one percent increase in bank size (LogSize) results in a -1.496 percent decreases in the banks' return on assets (ROA). The bank size's p value of 0.004 indicates that this link is statistically significant at the five percent significance level. As a result, bank size (LogSize) has a significant negative influence on return on assets (ROA) of the banks.

Table 7

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.661[a]	.437	.373	5.62075

a. Predictors: (Constant), LSIZE, NPLR, CRR, LEV, CDR

Source: Appendix- V

The R square is 0.437. This means that the independent variables (LSIZE, NPLR, CRR, LEV, CDR) explain 43.70 percent of the variation or effect in the dependent variable (ROE). The R statistic in this study, which is 0.661, shows that the study variables have a very strong association with one another. This suggests that the independent factors had a significant impact on the ROA. Regression analysis is perfectly correlated with standard error of estimate.

Table 8

Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1077.151	5	215.430	6.819	.000[b]
	Residual	1390.085	44	31.593		
	Total	2467.236	49			

a. Dependent Variable: ROE

b. Predictors: (Constant), LSIZE, NPLR, CRR, LEV, CDR

Source: Appendix- V

The overall fitness of the regression model for the data is shown in the ANOVA Table. With a p-value of 0.000, which is less than 0.05, it was shown that independent factors significantly predict ROE.

Table 9

Regression Coefficient of Independent Variables with ROE

Variables	Coefficients	t-statistics	p-value	VIF
(Constant)	76.355	2.968	.005	
CRR	.350	2.369	.022	1.342
CDR	.044	-.394	.695	2.259
NPLR	-1.151	1.349	.184	1.804
LEV	.174	.551	.584	1.903
LSIZE	-12.469	-2.134	.038	2.538

Source: Appendix- V

Table 9 shows the regression coefficient of independent variables cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio and bank size of sample banks and the intercept value of dependent variable ROE. It shows that variance inflation factors (VIF) is below 10 of all independent variables. That's why, there is no multicollinearity in the model.

The cash reserve ratio (CRR) and ROE have a positive association, according to the regression model's results, with a coefficient estimate of 0.350. This indicates that, provided other factors remain constant, a one percent rise in the cash reserve ratio reduces the banks' return on equity (ROE) by 0.350 percent. The p value of 0.022 indicates that this relationship is statistically significant at the five percent significance level. Thus, the cash reserve ratio has significant positive impact on return on equity of the sample banks.

The credit to deposit ratio (CDR), with a coefficient estimate of 0.044, indicates a positive correlation with ROE based on the results of the regression analysis. This indicates that when the credit to deposit ratio (CDR) increases by one percent while keeping other independent variables constant, the banks' return on equity (ROE) increases by 0.044 percent. The CDR's p value of 0.695 indicates that it is statistically insignificant at the five percent significance level. Therefore, credit to deposit ratio (CDR) has insignificant positive effect on ROE of the sample banks.

The non-performing loan ratio (NPLR) and ROE have a negative association, according to the regression results, with a coefficient estimate of -1.151. This indicates that when the non-performing loan ratio (NPLR) increases by one percent while keeping other independent variables constant, the banks' return on equity (ROE) decreases by -1.151unit. The NPLR's p value of 0.184 indicates that it is statistically insignificant at the five percent significance level. Therefore, the non-performing loan ratio (NPLR) has insignificant positive impact on ROE of the sample banks.

Leverage ratio (LEV) and ROE have a positive association, according to the regression result, with a coefficient estimate of 0.174. This indicates that, while keeping all independent variables constant, a one percent rise in the leverage ratio results in a 0.174 percent increase in the banks' return on equity. The leverage ratio's p value of 0.584 indicates that it is statistically significant at the five percent significance level. Leverage ratio thus has a statistically insignificant positive impact on return on equity of the banks.

The results of the regression model show that bank size (LogSize) and ROE have a negative association, with a coefficient estimate of -12.469. This demonstrates that, when all other independent variables are held constant, a one-unit increase in bank size (LogSize) results in a -12.469 unit decrease in the banks' return on equity (ROE). The bank size (LogSize) p-value of 0.038 indicates that this correlation is statistically significant at the five percent significance level. Hence, bank size (LogSize) has significant negative effect on return on equity (ROE) of the Nepalese commercial banks.

4.2 Discussion

The main objective of this study is to examine the effect of credit risk on profitability of commercial banks in Nepal. Credit risk has a direct impact on return on assets and returns on equity, the two main parameters for measuring profitability of the commercial banks. The correlation analysis shows that cash reserve ratio (CRR) has insignificant positive relationship with ROA of banks which is consistent with the finding of Bhattarai (2016) which observed that there is insignificant relationship between cash reserve ratio and ROA of the banks but opposite to the finding of Shrestha (2017). At the meantime, cash reserve ratio has significant positive relationship with return on equity which is similar with the findings of Al Zaidanin and Al Zaidanin (2021) but it is not consistent with the prior study of Shrestha (2017) concluded that CRR had negative relationship with ROE of the banks. Then, there is significant positive correlation between credit to deposit ratio and ROA which is inconsistent with the prior study of Shrestha and Niroula (2021) and also significant positive relationship between credit to deposit ratio and ROE which is also inconsistent with the previous study of Kawor and Atinyo (2022). At the meantime, NPLR has insignificant negative relationship with ROA and ROE of the commercial banks. This finding is similar with the findings of Shrestha (2017) which observed that non-performing loan had negative relationship with ROA of the banks. However, it contradicts with the finding of Bhattarai (2016); Biswas et al. (2021). Then, leverage ratio (LEV) has insignificant negative relationship with ROA which is similar with the finding of Shrestha (2017) but significant positive relationship with ROE which is consistent with the finding of Maharjan et al. (2016). Finally, bank size has significant negative relationship with ROA and significant negative relationship with ROE of the banks which is consistent with the finding of Poudel (2018). However, it contradicts with the finding of Bhattarai (2016) mentioned that bank size had positive association with ROA of the banks.

The multiple regressions found that cash reserve ratio (CRR) has insignificant positive impact on ROA of banks. This is consistent with the finding of Bhattarai (2016); Biswas et al. (2021) concluded that insignificant positive impact of cash reserve ratio on ROA of the banks but opposite to the finding of Shrestha (2017); Shrestha (2022). At the same time, loan to deposit ratio has insignificant positive impact on ROA of commercial banks in Nepal. The result is consistent with Risal and

Poudel (2020). However, it contradicts with the finding of Maharjan et al. (2016); Shrestha and Nirouala (2021) mentioned that loan to deposit ratio has negative effect on profitability (ROA) of commercial banks. NPLR has negative and insignificant impact on ROA in Nepalese commercial banks. This is also consistent with Bhattarai (2016); Maharjan et al. (2016) and Munangi and Sibindi (2020); Al Zaidanin and Al Zaidanin (2021) which found that NPLR has negative effect on ROA. However, it contradicts with the finding of Annor and Obeng (2017) concluded that there is positive and significant impact of NPLR on ROA of the banks. This study also found that leverage ratio has statistically significant negative effect on ROA of banks which is similar with the finding of Shrestha (2017) but it is not consistent with finding of Munangi and Sibindi (2020). The effect of bank size (LogSize) on ROA is significant negative of the banks. This is similar with the finding of Otieno, and Nyagol (2016); Biswas et al. (2021) which observed that bank size had negative impacts on ROA of the banks. However, it contradicts with the finding of Bhattarai (2016) concluded that bank size had positive impact on ROA of the banks.

The regression analysis also shows that CRR is found to have significant positive effect on ROE of banks. This is consistent with the finding of Biswas et al. (2021); Ayim and Agyemang (2021) concluded that positive impact of cash reserve ratio on profitability of the banks Shrestha (2017) but it is not consistent with the prior study of Shrestha (2022) concluded that there is negative effect of CRR on ROE of banks. Likewise, credit to deposit ratio has insignificant positive impact on ROE which is consistent with the findings of prior empirical studies of Risal and Poudel (2021). However, it contradicts with the finding of Maharjan et al. (2016) mentioned that credit to deposit ratio had negative impact on ROE of the banks. Further, non-performing loan ratio (NPLR) has negative and statistically insignificant impact on ROE. This is consistent with Gijaw et al. (2015); Al-Eitan and Bani-Khalid (2019); Poudel (2018); Dunyoh et al. (2022). However, it does not consistent with the finding of Munangi and Sibindi (2020) which concluded that there is positive effect of NPLR on ROE of the banks. This study also found that leverage ratio has statistically insignificant positive effect on ROE of banks which is consistent with the finding of Munangi and Sibindi (2020) but opposite to the finding of Shrestha (2017). Finally, the effect of bank size (LogSize) on ROE is significant negative of the banks. This is similar with the finding of Otieno, and Nyagol (2016) which observed that bank size

had negative impacts on ROE of the banks. However, it contradicts with the finding of Al-Eitan and Bani-Khalid (2019); Munangi and Sibindi (2020) concluded that bank size had positive impact on ROE of the banks.

CHAPTER V
SUMMARY AND CONCLUSION

5.1 Summary

Credit risk is essential to banks' growth and profitability, particularly for financial institutions. The fact that the marginal losses incurred by commercial banks when borrowers default demonstrate that credit risk persists despite their best efforts. While banks deal with a variety of issues, credit risk management whether directly or indirectly is the main contributor. By limiting risk exposures to reasonable levels, credit risk management aims to maximize an entity's risk-adjusted rate of return. It is required of banks to manage both the risk associated with individual credits or transactions and the credit risk inherent in the overall portfolio. On the other hand, among other things, there have been grievances over failure to fulfill duties, insufficient oversight, and a high percentage of defaulters. In order to improve company profitability through efficient credit risk management procedures, it is necessary to investigate how different aspects of credit risk impact the profitability of financial information. Because of this, the purpose of this study is to look at how credit risk affects Nepali banks' profitability.

The main purpose of the study is to evaluate the credit management and profitability of commercial banks in Nepal. The other specific objectives are to assess the position of credit risk and profitability position of commercial banks in Nepal, to examine the relationship between credit risk management and profitability of commercial banks in Nepal and to analyze the impact of credit risk factors (cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio and bank size) on profitability of commercial banks in Nepal.

To achieve the specific objective of the study, descriptive and causal research design has been carried out. Descriptive research used in the study supports to analyze the credit risk and profitability and find out the position of the banks through average value, standard deviation, maximum and minimum which describe the characteristics of data of commercial banks and causal research design supports to analyze the effect of credit risk management on profitability of commercial banks in the study. There are 20 commercial banks operating in Nepal. They constitute the population.

Among of them, NABIL, SBI, EBL, SCB and NBL are selected for the study of credit risk as sample on the basis of purposive sampling method because these banks are top five in profitability in the present context and managing non-performing loan or credit risk. This study is based on secondary data which is taken from annual reports of related banks for ten year periods (2013/14-2022/23). In this study, descriptive analysis, correlation analysis and multiple regressions are applied by using SPSS version 26. This study used ROA and ROE as dependent variables and cash reserve ratio, credit to deposit ratio, non-performing loan, leverage ratio and bank size are as explanatory variables.

This study shows that the credit risk position in terms of non-performing loan ratio of Nepalese commercial banks performing best or maintaining their NPLs perfectly among them which shows sample banks have low credit risk. Profitability position in terms of ROA and ROE, sample banks could manage their overall operations due to high ratio which means sample banks have generated income and making progressive performance. The correlation analysis concluded that cash reserve ratio has significant positive relation with ROE. Likewise, there is significant positive correlation between credit to deposit ratio with profitability (ROA and ROE). However, non-performing loan ratio has insignificant negative relationship with profitability. Then, leverage ratio has insignificant negative relationship with ROA but significant positive relationship with ROE. Further, bank size has significant negative relationship with profitability of the banks. The multiple regression analysis shows that cash reserve ratio has insignificant negative effect on ROA and significant positive effect on ROE of the banks. Then, credit to deposit ratio has insignificant positive impact on profitability whereas non-performing loan ratio has insignificant negative impact on profitability of the sample banks. Besides these, leverage has significant negative impact on profitability ROA and insignificant positive impact on ROE of the banks. Finally, banks size has significant negative impact on ROA and ROE. Therefore, this study concluded that there is insignificant negative effect on profitability in Nepalese commercial banks.

5.2 Conclusion

The findings of the research concluded that Nepalese commercial banks have strong liquidity position due to high cash reserve ratio and low liquidity risk and they are

successful to mobilize its total deposit as loan and advances and acquiring high profit. On the other hand sample banks have low credit risk and lending policy of the banks is sound and effective as it is acceptable up to a certain limit or below five percent. Sample banks have currently indicates that a substantial portion of funding comes from creditors as opposed to owners. The profitability position of commercial banks is strong. The summary of ROA shows that strong efficient the banks are using its assets to generate profit. ROE is satisfactory which means there is progressive market performance.

The correlation analysis concluded that cash reserve ratio (CRR) has insignificant positive relation with ROA and significant positive relation with ROE. Likewise, there is significant positive correlation between credit to deposit ratio (CDR) with profitability (ROA and ROE). However, non-performing loan ratio has insignificant negative relationship with ROA and ROE. Then, leverage ratio has insignificant negative relationship with ROA but significant positive relationship with ROE. Finally, bank size has significant negative relationship with profitability (ROA and ROE) of the banks.

The multiple regression analysis concluded that cash reserve ratio has insignificant negative effect on ROA and significant positive effect on ROE of the banks. At the meantime, credit to deposit ratio has insignificant positive impact on profitability. However, non-performing loan ratio has insignificant negative impact on profitability (ROA and ROE) of the sample banks. Then, leverage has significant negative impact on profitability ROA and insignificant positive impact on ROE of the banks. Moreover, banks size has significant negative impact on ROA and ROE. Hence, this study concluded that credit risk management has insignificant negative impact on profitability of commercial banks in Nepal.

5.3 Implications

The investigation has led to the following conclusions about how credit risk management may have a greater influence on Nepalese commercial banks' profitability.

- This study found that leverage ratio and bank size have significant negative impact on ROA. On the other hand, cash reserve ratio has significant positive

impact on ROE and bank size has significant negative impact on ROE. However, credit risk (non-performing loan ratio) has insignificant negative effect on profitability (ROA and ROE) of the banks. This data gives bank management and policy makers suggestions for scientific credit risk management in order to minimize asset security, lower the high percentage of non-performing loans and their negative consequences on profitability. Additionally, it enhances their proficiency in loan administration and credit analysis.

- Based on the study's analysis of the several aspects of bank credit risk and how credit affects banks' profitability, it can be concluded that effective management of credit risk will benefit not just banks but also people, businesses, and the economy as a whole. Consequently, this enhances the welfare of the financial industry within the economy and the community at large.
- The research also forces commercial bank management to evaluate their own previous actions and provides guidance for their next goals and initiatives. This study can provide some of the most recent information, statistics, and challenges related to credit risk. Therefore, bankers, stockholders, depositors, as well as future scholars and students, will find this study to be relevant.
- Future researchers looking to learn more about credit risk management and how it affects the profitability of Nepalese commercial banks might refer to these results.

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APPENDICES

APPENDIX – I

Data of Sample Banks

Banks	Year	CRR	CDR	NPLR	LEV	SIZE	ROA	ROE
NABIL	2013/14	13.26	72.55	2.30	10.42	87275	2.66	30.36
	2014/15	15.35	62.84	1.86	11.23	115986	1.81	22.07
	2015/16	9.31	69.02	1.17	9.98	127300	2.21	24.31
	2016/17	11.01	75.59	0.81	8.96	140332	2.57	25.63
	2017/18	10.26	83.56	0.54	7.21	169076	2.36	19.34
	2018/19	6.49	81.25	0.74	7.67	201139	2.11	18.28
	2019/20	11.82	79.72	0.99	8.19	237680	1.46	13.39
	2020/21	5.19	90.63	0.83	7.60	291066	1.56	13.37
	2021/22	5.60	94.23	1.62	6.92	419818	1.01	8.03
	2022/23	7.88	84.71	3.39	7.46	481204	1.33	11.25
SBI	2013/14	12.21	64.74	0.26	12.46	61073	1.51	20.35
	2014/15	16.34	77.44	0.19	9.50	59277	1.80	18.86
	2015/16	15.93	72.03	0.14	10.35	78515	1.70	19.25
	2016/17	16.22	77.27	0.10	8.58	99752	1.54	14.78
	2017/18	12.58	86.50	0.20	7.01	102539	1.97	15.81
	2018/19	14.28	88.46	0.20	7.36	118314	1.94	16.20
	2019/20	12.65	84.08	0.23	7.96	132402	1.17	10.44
	2020/21	7.24	90.39	0.23	7.95	137809	0.70	6.25
	2021/22	6.10	89.05	0.15	7.95	153103	1.07	9.57
	2022/23	7.75	78.74	2.45	9.18	185958	1.06	10.77
EBL	2013/14	21.21	76.60	0.99	11.91	70445	2.20	28.40
	2014/15	30.23	65.57	0.67	13.39	99153	1.59	22.84
	2015/16	24.66	72.50	0.39	12.38	113885	1.52	20.32
	2016/17	22.49	81.28	0.26	9.09	116510	1.72	17.38
	2017/18	24.08	80.89	0.20	7.98	144818	1.78	16.00
	2018/19	23.26	86.04	0.16	8.65	170077	1.80	17.33
	2019/20	17.68	82.27	0.22	8.93	185023	1.36	13.50
	2020/21	21.75	84.01	0.12	9.23	211650	0.84	8.56
	2021/22	10.48	89.38	0.12	8.89	225381	1.10	10.88
	2022/23	11.14	84.10	0.79	8.86	250090	1.34	13.25
NBL	2013/14	9.61	56.30	5.40	22.30	77980	0.92	21.42
	2014/15	11.55	65.35	4.17	22.03	88211	0.55	12.63
	2015/16	17.46	68.50	3.23	14.41	103480	2.79	42.94
	2016/17	18.81	76.37	3.44	8.78	112057	2.78	27.23
	2017/18	10.94	78.43	3.01	4.97	136811	2.35	14.03
	2018/19	12.24	80.93	2.69	4.86	171516	1.51	8.87
	2019/20	7.74	74.71	2.52	5.37	191163	1.22	7.77
	2020/21	8.03	86.76	1.65	5.70	222645	1.33	8.91
	2021/22	6.71	90.10	1.86	6.33	260078	1.12	8.24
	2022/23	10.50	74.07	2.92	7.12	296736	1.16	9.41
SCB	2013/14	19.84	56.11	0.49	9.48	53324	2.51	26.28
	2014/15	20.20	48.32	0.34	9.92	64927	1.99	21.69
	2015/16	7.13	56.17	0.33	7.66	65186	1.98	17.17
	2016/17	13.98	61.47	0.20	5.52	77409	1.84	11.99
	2017/18	8.83	69.29	0.18	4.97	83095	2.64	15.73
	2018/19	5.64	72.97	0.15	5.25	93264	2.61	16.31
	2019/20	4.37	57.36	0.44	6.71	116438	1.71	13.16
	2020/21	4.10	74.46	0.97	6.07	114739	1.22	8.62
	2021/22	4.42	87.71	0.59	5.81	123356	1.83	12.46
	2022/23	5.12	77.28	1.24	6.52	151378	2.29	17.20

Source: Annual Reports of Sample Banks

APPENDIX -II

Descriptive Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
CRR	50	4.10	30.23	12.6334	6.29636
CDR	50	48.32	94.23	76.3620	10.73734
NPLR	50	.10	5.40	1.1628	1.26414
LEV	50	4.86	22.30	8.8606	3.51504
LSIZE	50	4.73	5.68	5.1241	.21894
ROA	50	.55	2.79	1.7028	.57276
ROE	50	6.25	42.94	16.3766	7.09590
Valid N (listwise)	50				

Source: Researcher Calculation by using SPSS version 26

APPENDIX -III

Pearson Correlation Coefficients

		CRR	CDR	NPLR	LEV	LSIZE	ROA	ROE
CRR	Pearson Correlation	1	-.208	-.179	.339*	-.332*	.156	.445**
	Sig. (2-tailed)		.147	.214	.016	.018	.281	.001
	N	50	50	50	50	50	50	50
CDR	Pearson Correlation	-.208	1	-.161	-.417**	.687**	-.283*	-.465**
	Sig. (2-tailed)	.147		.265	.003	.000	.046	.001
	N	50	50	50	50	50	50	50
NPLR	Pearson Correlation	-.179	-.161	1	.436**	.180	-.117	.128
	Sig. (2-tailed)	.214	.265		.002	.211	.418	.374
	N	50	50	50	50	50	50	50
LEV	Pearson Correlation	.339*	-.417**	.436**	1	-.351*	-.206	.444**
	Sig. (2-tailed)	.016	.003	.002		.012	.152	.001
	N	50	50	50	50	50	50	50
LSIZE	Pearson Correlation	-.332*	.687**	.180	-.351*	1	-.412**	-.527**
	Sig. (2-tailed)	.018	.000	.211	.012		.003	.000
	N	50	50	50	50	50	50	50
ROA	Pearson Correlation	.156	.283*	-.117	-.206	-.412**	1	.721**
	Sig. (2-tailed)	.281	.046	.418	.152	.003		.000
	N	50	50	50	50	50	50	50
ROE	Pearson Correlation	.445**	.465**	-.128	.444**	-.527**	.721**	1
	Sig. (2-tailed)	.001	.001	.374	.001	.000	.000	
	N	50	50	50	50	50	50	50

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

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

Source: Researcher Calculation by using SPSS version 26

APPENDIX -IV

Multiple Regression Analysis of Sample Banks (In ROA)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.619[a]	.384	.314	.47456

a. Predictors: (Constant), LSIZE, NPLR, CRR, LEV, CDR

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.166	5	1.233	5.476	.001[b]
	Residual	9.909	44	.225		
	Total	16.075	49			

a. Dependent Variable: ROA

b. Predictors: (Constant), LSIZE, NPLR, CRR, LEV, CDR

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	10.131	2.172		4.664	.000		
	CRR	.020	.012	.220	1.601	.116	.745	1.342
	CDR	.003	.009	-.062	-.349	.729	.443	2.259
	NPLR	-.132	.072	.292	1.836	.073	.554	1.804
	LEV	-.103	.027	-.634	-3.883	.000	.526	1.903
	LSIZE	-1.496	.493	-.572	-3.033	.004	.394	2.538

a. Dependent Variable: ROA

Source: Researcher Calculation by using SPSS version 26

APPENDIX -V

Multiple Regression Analysis of Sample Banks (In ROE)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.661[a]	.437	.373	5.62075

a. Predictors: (Constant), LSIZE, NPLR, CRR, LEV, CDR

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1077.151	5	215.430	6.819	.000[b]
	Residual	1390.085	44	31.593		
	Total	2467.236	49			

a. Dependent Variable: ROE

b. Predictors: (Constant), LSIZE, NPLR, CRR, LEV, CDR

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	76.355	25.727		2.968	.005		
	CRR	.350	.148	.311	2.369	.022	.745	1.342
	CDR	.044	.112	-.067	-.394	.695	.443	2.259
	NPLR	-1.151	.853	.205	1.349	.184	.554	1.804
	LEV	.174	.315	.086	.551	.584	.526	1.903
	LSIZE	-12.469	5.843	-.385	-2.134	.038	.394	2.538

a. Dependent Variable: ROE

Source: Researcher Calculation by using SPSS version 26

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