IMPACT OF CREDIT RISK ON PROFITABILITY OF NEPALESE COMMERCIAL BANKS

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

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CERTIFICATION OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled "Impact of Credit Risk on Profitability of Nepalese Commercial Banks". 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.

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REPORT OF RESEARCH COMMITTEE

Mr. Suman Shrestha has defended research proposal entitled "**Impact of Credit Risk on Profitability of Nepalese Commercial Banks**" 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 Asst. Prof. Dr. Tri Ratna Manandhar and submit the thesis for evaluation and viva voce examination.

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APPROVAL SHEET

We, the undersigned, have examined the dissertation entitled **Impact of Credit Risk on Profitability of Nepalese Commercial Banks"** presented by Suman Shrestha 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.

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ABBREVIATIONS

BS	:	Bikram Sambat
CB	:	Commercial Banks
CDR	:	Credit to Deposit Ratio
CRR	:	Cash Reserve Ratio
GIBL	:	Global IME 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
NMB	:	NMB 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
SD	:	Standard Deviation
SIZE	:	Total Assets of Banks
TA	:	Total Assets
TU	:	Tribhuvan University

ABSTRACT

This study investigates the impact of credit risk on profitability of commercial banks in Nepal. Secondary data was gathered from commercial banks of Nepal for ten year periods (2012/13-2021/22). 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 SBI performing best or maintaining their NPLs perfectly among them which shows SBI has lowest credit risk among them. Profitability position in terms of ROA, NABIL could manage their overall operations due to highest ratio among them. However, NABIL the best or most effective management in earning profit among them. Moreover, it can be said that NABIL is generating more income and making progressive performance among them due to the highest ROE. The correlation analysis reveals that cash reserve ratio (CRR) has insignificant negative relation with ROA and insignificant positive relation with ROE. Likewise, there is insignificant positive correlation between credit to deposit ratio (CDR) and ROA and significant positive relationship with 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 insignificant negative relationship with ROA and significant negative relationship with ROE of the banks. The multiple regression analysis shows that cash reserve ratio has insignificant negative effect on profitability (ROA and ROE) of the banks. However, credit to deposit ratio has significant positive impact on profitability. At the same time, non-performing loan ratio and bank size have insignificant negative impact on profitability of the sample banks. Finally, leverage has significant negative impact on profitability (ROA and ROE) of the banks.

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

CHAPTER – I
INTRODUCTION

1.1 Background of the Study

The possibility of financial loss should a counterparty or bank borrower fail to fulfill their responsibilities in line with the terms of the agreement. Credit risk is the most prestigious risk inside financial organizations and has a greater impact than other risks as it directly jeopardizes the stability of financial institutions (Vidyashree & Rathod, 2015). Credit risk can lead to major loan losses and even bank failure because of its vast scope and scale of loss when compared to other forms of risks. The main causes of serious banking issues continue 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, despite the fact that financial institutions have dealt with issues over the years for a variety of reasons.

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 (Sinkey, 1992). 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. 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 (Jamaat & Asgari, 2010). 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).

Financial institutions are essential to a country's development and progress. However, they face a number of hazards throughout business operations that make it impossible

for them to achieve their goals. The probability that a borrower won't pay back all or part of the money borrowed, plus interest, is measured by credit risk. One of the most crucial roles in a company that aids in reducing the severe effects of credit risks is credit management. For a business, especially a financial institution, to be profitable and thrive, credit risk management is essential. 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 (Shrestha & Niroula, 2021). 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 develop a way to increase business profitability through efficient credit risk management procedures, it is necessary to investigate how different aspects of credit risk management impact the profitability of financial information. That's why, this study therefore seeks to investigate the effect of credit risk management on profitability of banks in Nepal.

1.1.1 Brief Profile of Sample Banks

Nabil Bank Limited (NABIL)

Nabil Bank Limited, Nepal's first foreign joint venture bank, commenced operations in July 1984 under the company legislation of 1964. The original foreign partner gave Emirates Bank Limited ownership of its shares on January 1, 2002, and National Bank Limited received those shares on the same day. Prior to becoming Nabil Bank Limited, the bank was known as Nepal Arab Bank Limited. Financial institutions own twenty percent, the general public owns thirty percent, and National Bank Limited (Bangladesh) owns fifty percent.

At Nabil, our mission is to be a bank that provides a wide range of financial solutions, fosters values for all of our stakeholders, and operates as a business and civic hub in the nation, catering to individuals from all socioeconomic backgrounds and geopolitical zones. We're thrilled to establish ourselves as a leading bank in each of the 50 states. NABIL was incorporated with the intention of provide cutting-edge,

globally compliant financial services to various social groups. In order to do this, NABIL provides a wide range of commercial banking services. NABIL represents a watershed in the history of banking in Nepal by being the first bank to introduce a number of innovative products and marketing techniques. It also ushers in a new era of modern banking where maximizing customer satisfaction is the main objective of doing business. The bank's highly qualified and seasoned management team is in charge of both risk management and day-to-day operations. All of the modern conveniences that the bank has to offer are credit cards, ATMs, Internet banking, telebanking, and state-of-the-art, internationally renowned software from Infosys Technologies System, located in Bangalore, India. The bank also offers other services like travel cards, Nabil installment loans, Nabil phone loans, Nabil viber banking, electronic payments, Nabil remit, and Western Union (www.nabil.com.np).

Nepal SBI Bank Limited (NSBL)

The first joint venture between India and Nepal in the financial sector, Nepal SBI Bank Ltd. (NSBL), was sponsored by three institutional promoters: State Bank of India, Employees Provident Fund, and Agricultural Development Bank of Nepal. The Memorandum of Understanding was signed on July 17, 1992. The bank, which employs about 600 people, transfers, lends, invests, and protects the money of over 350,000 customers both locally and abroad. Since its establishment on July 7, 1993, Bank has been continuously raising the standard of its service delivery and client satisfaction with the use of state-of-the-art technology. Being one of the biggest private banks in Nepal, the bank has 70 physical locations, comprising 59 full-fledged branches, 7 extension counters, and 4 administrative offices, that span 31 districts. Furthermore, the Bank provides its esteemed clientele with e-delivery channels such as Automated Teller Machines (ATMs), Online Banking, and Mobile Banking for both corporate and individual customers.

The bank, which has been in the banking industry for more than 203 years, is a subsidiary of State Bank of India, which is, by almost all measures, the biggest bank in India. The public owns thirty percent of the remaining shares, while Employee Provident Fund, a local partner, owns fifteen percent. As per the Technical Services Agreement signed by SBI and the NSBL, the bank's management receives assistance from SBI's international executives, including the Managing Director, who functions

as the CEO of the organization. The Central Management Committee (CENMAC), comprised of the Managing Director, Chief Operating Officer, Chief Financial Officer, and Chief Credit Officer, is in charge of overseeing the Bank's whole banking activities (www.nepalsbibank.com.np).

Global IME Bank Ltd. (GIBL)

The first "A" class commercial bank in Nepal, Global Bank Limited (GBL) was founded in 2007 and provides a complete range of commercial banking services. The bank had the largest capital basis when it was created, with NPR 1.0 billion in paid-up capital. The bank's paid-up capital has increased to NPR 8.08 billion since then. The bank's shares are listed in the 'A' category of corporations on the Nepal Stock Exchange.

Global IME Bank Ltd. (GIBL) was established following the successful 2012 merger of Global Bank Ltd. (a "A" class commercial bank), IME Financial Institution (a "C" class finance business), and Lord Buddha Finance Ltd. (a "C" class finance company). In 2013, Gulmi Bikas Bank and Social Development Bank, two more development banks, merged to become Global IME Bank Ltd. Later in 2014, Trust Bank Nepal Ltd., a "A" class commercial bank, and Global IME Bank merged once again. Global IME Bank Limited acquired both "B" class development banks, Reliable Development Bank Limited and Pacific Development Bank Limited, between 2015 and 2016. The ownership breakdown is as follows: 51.24 percent promoters own the remaining shares, regular shareholders own 48.65 percent, and the Nepali government owns 0.11 percent.

It is consistent with the bank's mission to be "The Bank for Everyone" by providing the essential boost to the economy through top-notch financial services. The bank uses the well-known FINACLE software, which offers real-time access to the client database across all of its branches and corporate offices, for day-to-day operations. A management information system has also been connected to this cutting edge customer database, making it simple to access all database data for making well-rounded decisions. The Bank has also set up a disaster recovery system (DRS) in the Western Region of Nepal, which is located 200 kilometers west of Kathmandu. The bank has been successful in diversifying its holdings rather well. With long-term

forecasting and appropriate strategic planning, exposure in areas of national interest has been distributed in a way that is well-balanced. To name a few, the bank's diverse interests include hydropower, manufacturing, textiles, services, aviation, exports, trade, and microfinance operations (www.globalimebankltd.com).

NMB Bank Limited (NMB)

NMB Bank Limited, one of the leading commercial banks in the industry, has been active in the Nepalese financial market for over 20 years. In May 2008, Nepal Rastra Bank awarded it a "A" class financial institution license.

Under the terms of their joint venture agreement, Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden (FMO) owns 13.69% of the Bank's shares, making FMO the largest investor. In September 2016, the Dutch development bank Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden (FMO) and the Bank signed a joint venture agreement. Consequently, FMO emerged as the Bank's principal shareholder. NMB Bank will be in a position to lead the sector in agricultural, renewable energy, and risk management for the environment and society thanks to their collaboration with FMO.

The titles of "Bank of the Year 2017," "Bank of the Year 2018," "Bank of the Year 2020," and "Bank of the Year 2021" were given to NMB Bank. The bank was named "Bank of the Year 2021 Asia" by The Banker, Financial Times, London, in the same year, marking the first time in Nepalese history (https://www.nmb.com.np).

1.2 Problem statement

The entire process called as credit risk management includes determining the target markets, providing credit, keeping an eye on credit, and determining the proceeds. Credit management policy refers to the procedures, standards, and directives that bank employees follow while granting loans and overseeing the loan portfolio. It is a set of regulations designed to maximize the drawbacks of credit while reducing its benefits. Credit departments of financial institutions use credit management policies, according to Alshatti (2015), to help them provide credit privileges that adhere to standards and guidelines established by upper management.

Bhattarai (2016) revealed that there is a negative correlation between the non-performing loan ratio and bank performance, but a positive correlation between bank size and performance. Shrestha (2017) found a favorable correlation between cost per loan asset and return on profitability. Annor and Obeng (2017) indicated that because depositor deposits make up over 85% of the industry's liabilities, the banking sector's basic structure is exceedingly vulnerable. Most banks get their revenue from creating credit for their borrowers through these deposits. The banks are exposed to a high default risk through this credit generation process, which could result in financial hardship, including bankruptcy. Nevertheless, in addition to providing other services, banks need to extend credit to their customers in order to generate revenue, expand, and endure fierce competition in the marketplace.

Poudel (2018) affirmed that credit risk has a major detrimental effect on Nepal's commercial banks' profitability. Furthermore, inflation and the interest spread rate have a negligible detrimental effect on profitability. On the other hand, the capital adequacy ratio and total assets significantly increased the profitability of Nepal's commercial banks. Al-Eitan and Bani-Khalid (2019) shown 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. Munangi and Sibindi (2020) found a negative correlation between financial performance and size. Biswas, Nath, Biswas, and Rashid (2021) showed 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. The cash reserve ratio did not, however, show a statistically significant correlation with ROA.

Shrestha and Nirouala (2021) concluded that CDR and NPLR greatly reduced ROA. On the other hand, ROA benefits from the predictors CAR and IRS. Kawor and Atinyo (2022) found that whereas NP/LA and LA/TD significantly benefited ROA, PLL/NL showed a negative connection. 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. The profitability and credit risk of Nepal's commercial banks are inversely correlated, according to empirical research. Thus, the goal of this research is to ascertain how credit risk influences Nepalese

commercial banks' profitability. Specifically, this study is connected to search answer of the following questions related to the selected commercial banks.

- What is the position of credit risk and profitability position of commercial banks in Nepal?
- What is the relationship between credit risk and profitability of commercial banks in Nepal?
- What is the impact of credit risk factors on profitability of commercial banks in Nepal?

1.3 Objectives of the Study

The general objective of the study is to examine the impact of credit risk on profitability of banks in Nepal. The specific objectives are as follows;

- To analyze the position of credit risk and profitability position of commercial banks in Nepal.
- To investigate the relationship between credit risk and profitability of commercial banks in Nepal.
- To examine the impact of credit risk factors on profitability of commercial banks in Nepal.

1.4 Research Hypothesis

The literature discussed in the section above makes it evident that there is a great deal of interest in finding out more about the relationship between credit risk management and the profitability of commercial banks.

H_1: Cash reserve ratio has no significant impact on profitability of finance companies in Nepal.

H_2: Credit to deposit ratio has no significant impact on profitability of finance companies in Nepal.

H_3: Non-performing loan to loan has no significant impact on profitability of finance companies in Nepal.

H_4: Leverage ratio has no significant impact on profitability of finance companies in Nepal.

H_5: Bank size has no significant impact on profitability of finance companies in Nepal.

1.5 Rational of the Study

The results of the study help the management of Nepal's 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 Nepali banks.

1.6 Limitations of the Study

The limitations of the study are as follows;

- Though, there has been in operation of twenty commercial banks in Nepal, only four commercial banks SBI, NABIL, NMB and GIBL are taken for the proposed study and thus may not represent the whole population.
- The study is based on secondary data such as annual reports, financial statement, books, journals and articles etc.
- The study covers only the latest ten fiscal years i.e. 2012/13 to 2021/22.
- Only selected financial and statistical tools are used in this study.

CHAPTER - II
LITERATURE REVIEW

Any research project needs to utilize and rely on the process of literature reviews. It entails reading research papers or other pertinent statements in the field to which the study is related in order to ascertain the limitations, findings, and recommendations for additional research from all earlier studies. Numerous relevant books, articles, and pieces from published and unpublished economic journals, periodicals, and newspapers are examined and evaluated in this chapter. It also examines previously published theses on the topic, web searches, and the yearly balance statements of the pertinent banks. The theoretical review and the empirical review are the two elements that make up this chapter.

2.1 Theoretical Review

2.1.1 Theories of Credit Risk

Reading through the broad concepts of credit risk management in this part can assist provide a deeper understanding of how banks manage credit risk, even if specific methods may differ throughout institutions. The credit risk hypotheses are as follows:

2.1.1.1 The Credit Risk Theory

Salas and Saurina (2002) argued credit risk is the possibility that a borrower would stop making loan payments, which would result in a default. Included in the risk, which ultimately belongs to the lender, is principle and interest loss. When an insolvent bank is unable to return funds to a depositor, for example, there may be a complete or partial disruption loss. To reduce the lender's risk, the lender may perform a credit check on the prospective borrower, require that the borrower obtain the appropriate insurance, such as mortgage insurance, or search for collateral or guarantees from other sources. Generally speaking, the interest rate that debtors will be required to pay on their loan will increase with the level of risk (Owojori, Akintoye & Adidu, 2011).

2.1.1.2 The Anticipated Income Theory

Prochnow developed a ground-breaking lending theory in 1949 that he named "the Anticipated Income Theory" following extensive study. In all cases, regardless of the

form and nature of the borrower's company, the bank intended to liquidate term loans from the borrower's projected earnings, according to Afriyie and Akotey's (2011) study. Rather of selling the borrower's assets, as in the conventional or commercial theories of liquidity, or shifting the term loan to another lender, as in the shiftability theory of liquidity, liquidity is gained by projecting the borrower's future income. This idea basically suggests that rather than considering the borrower's actual income, banks should make loan decisions based on his future income. Kolapo, Ayeni, and Oke (2012) describe this theory as a "future-oriented approach" to bank advances. It's generally known as the "cash flow approach" to financing at times. Assuming correct comprehension of this theory, the only idea it competed with was the commercial loan concept, not the shift ability hypothesis. It does not refute the shiftability theory, which holds that a bank's main source of liquidity comes from its secondary reserves. Rather, it focused once more on the kinds of loans that banks ought to be permitted to make, but the conclusions it reached were far different from those of those who supported the theory of commercial lending (Moti, Masinde, & Mugenda, 2012).

2.1.1.3 Commercial Loan Theory

The first banking theory is the commercial loan notion, sometimes referred to as the real bills concept. Banks should only provide short-term, self-liquidating commercial paper loans, claims the commercial loan hypothesis. According to Hosna and Manzura (2009), the commercial loan hypothesis is intended to have a strong effect on bank lending as well as total economic activity. Strictly implementing this concept will demonstrate that it is expected to respond as a financial source to shifts in the overall level of economic activity. It is evident that Nigeria's Deposit-Money Banks (DMBs) support this philosophy. Nigerian bankers believe that since these depositors' money may be returned rapidly, it is best to use it for short-term loans.

Kargi (2011) argues that the strong linkages to this theory seem quite conventional when one considers that the theory was prominent during a time when secondary reserve assets were few or nonexistent, perhaps acting as a buffer against liquidity for the bank. Moreover, this theory disregards Nigeria's developing economy's credit needs. It hasn't encouraged banks to offer loans for the purchase of homes, cars, machinery, or plants. A theory's insistence that all loans must be repaid in the normal course of business demonstrates its incapacity to recognize the relative stability of

bank deposits. Although it's improbable that every depositor will request payment at once, demand deposits are made on demand. As a result, a bank can extend funds for a respectable amount of time without running the risk of illiquidity because to deposit stability. Despite its shortcomings, the real bills doctrine, often known as the commercial loan theory, has been a widely accepted banking theory. There are still traces of it in the way many bankers think, the way bank regulatory bodies are structured, and the way banks examine themselves. Without knowledge of our financial past, one cannot comprehend modern banking, and one cannot comprehend banking past without knowledge of commercial loan theory.

2.1.1.4 The Shiftability Theory

This theory states that assets are not limited to self-liquidating bills; they may also be kept in other moveable open-market assets such as government securities (Moti, Masinde & Mugenda, 2012). It is important to emphasize that the shiftability thesis did not invalidate or replace the commercial loan theory. Rather, the shiftability hypothesis provided a more complete view of the banking sector by extending the range of assets deemed appropriate for bank ownership. The shiftability theory does not indicate that commercial loans are improper bank assets; rather, it simply states that they are not the only permissible asset. The shiftability theory's central claim is that a bank's ability to sell its assets to a third party for a set price determines how liquid it is. Therefore, it would be entirely acceptable to have short-term open market investments in the asset portfolio of a bank.

According to Hosna and Manzura, (2009), the shiftability hypothesis has a tremendous influence on banking practices can scarcely be refuted. In essence, it redirected bankers' and regulators' focus from loans to investments as a means of supplying bank liquidity. In fact, the theory's proponents contended that short-term, commercial loans' supposed liquidity was essentially untrue to begin with. Kargi (2011) asserts that the shiftability theory had a significant flaw, just like the commercial loan theory. In actuality, this problem was more in the bank management practices that the theory led to than it was in the theory itself—a fact that was widely acknowledged by the different authors on the issue. The theory's flaw was as follows: while a single bank might get the liquidity it required by moving its assets, this was not the case for all banks combined.

2.1.1.5 The Liability Management Theory

This theory states that a bank does not have to follow traditional guidelines if it has a reserve deficiency since reserve funds can be obtained or purchased on the money market through short-term loan instruments. Shafiq & Nasr (2010) make clear that this does not mean the bank only manages its responsibilities and treats its assets passively. Rather, the theory continues to maintain that a bank's asset structure plays a significant role in providing liquidity to the bank. Nevertheless, the theory only takes into account one component of liquidity, arguing that the bank may also use its obligations to generate liquidity. A bank needs liquidity to fulfill its clients' legitimate lending demands as well as to allow deposit withdrawals. Bank loans are not only lucrative, but a bank that cannot or will not lend money to its depositors in times of need is unlikely to retain those depositors for very long.

2.1.2 Factor Affecting Credit Risk

John et al. (2002) stated that a company's credit policy offers the foundation for deciding whether or not to grant credit and loans of this kind. Credit criteria and credit analysis are the two main facets of a bank's credit policy choices. A company must develop acceptable sources of credit information, techniques of credit analysis, and criteria for making credit decisions. A instrument for assessing and controlling credit risk is the credit management plan, often known as the credit policy. In general, good credit risk management takes into account the following elements. It is also known as the credit policy considerations. Obtaining effective credit worthiness is beneficial.

Industry Environment

It establishes the industrial structure's attractiveness, the firm's place in it, the structural vulnerabilities of a disadvantageous company, theaters' first line of defense, and security value.

Financial Conditions

As a preliminary step, it assesses the borrower's ability to repay using cash flow. It is also evaluated how strong the backup plan, or collateral liquidation, is. Repayment capability is further threatened by the potential to rely on the income of a sister company in the event that the company experiences financial difficulties.

Technical Strength

It establishes the level and caliber of technical assistance necessary for the business to operate sustainably in terms of labor force, the viability of the technology used, the accessibility of after-sale services, and the necessary evaluation of maintenance and replacement costs.

Management quality

It assesses the management team of the borrower's honesty, skill, and kind of partnerships. It is necessary to assess substitutes for weakness.

Security realization

It establishes the control over the numerous securities that the bank received in order to guarantee the loan, given the document's validity and the current value of the properties that the bank has mortgaged. The bank's backup exit strategy is at risk due to security lapses.

2.1.3 Process of Credit Risk Management

Beginning with a precise evaluation of the client base's creditworthiness and viability as a firm, credit management begins. This is especially crucial if the business decides to give certain of its clients access to a credit line or revolving credit. Therefore, appropriate credit management involves establishing prerequisites that a client has to fulfill in order to be approved for the suggested credit arrangement. Credit management also requires figuring out the total credit line that will be offered to a certain consumer as part of the evaluation process (Prasanna, 1988).

As part of the credit management process, a variety of factors impact a customer's assessment and eligibility for the issuing of commercial credit. To do this, it is necessary to gather data on the current financial status of the potential client, including the value of the collateral and the client's prior credit history, which indicates the latter's reliability in meeting obligations. The current ratio of revenue to outstanding financial obligations will also be considered.

In addition to shielding the bank or other financial institution from potential losses, competent credit management aims to prevent the client from accruing further debt

that will be impossible to pay off on time. Everyone who is involved gains from the credit management process when it runs smoothly. Financial institutions, like banks, can reasonably be assured that loans given to customers will be repaid within the agreed upon terms or that minimum payments on credit account balances will be made on a regular basis. Clients can establish a good rapport with the creditor and so generate a reliable credit reference (Richard & Stewrat, 1996).

2.1.4 Credit Analysis

The main technique for lowering the credit risk associated with a loan request is credit analysis. This entails assessing the borrowers' financial standing, projecting the likelihood of default, and lowering the risk of non-repayment to a manageable level. Credit assessments are often predicated on the subjective opinion of the loan officer (also known as the judgmental assessment approach).

Bank officials examine all relevant data when a customer requests a loan to ascertain whether the loan satisfies the bank's risk-return goals. A loan officer uses credit analysis, which is basically default risk analysis, to assess a borrower's ability and willingness to repay. The five C's of credit are frequently used by bank credit analysts to concentrate their attention on the most important aspects of an applicant's creditworthiness. Five C's of credit were identified by Lawrence (2009). Character, capacity, capital, collateral, and conditions are a few of them.

Character

Character analysis evaluates the applicant's capacity to fulfill the demands made on him by the lending organization. Generally speaking, the following documents are required for this analysis.

- A memorandum and articles of association
- A registration certification; a tax registration certificate (renewed)
- A resolution to borrow; an authorization letter from the person granting permission to deal with the bank
- A reference from previous lenders the applicant has dealt with; or a customer's bank account statement.

Capacity

Combines the customer's available credit. It is ascertained by first examining the applicant's past performance records and then meeting with them in person. Speaking with the applicant's clients and suppliers will help to clarify the situation even more.

- Certified balance sheet and profit and loss account for at least past 3 years.
- References or other lenders with whom the applicant has dealt in the past or bank A/C.

Capital

In order to protect debt repayment from operational and asset losses, capital acts as a safeguard. This demonstrates the applicant's ability to contribute his own funds. Capacity analysis can be used to determine if the borrower is attempting to use the lender's funds exclusively or whether he is contributing his own funds to the project. Financial documents, such as certified balance sheets and profit and loss accounts, are the sole resources available for capital analysis.

d. Collateral

The security that the borrower offers is called collateral. A sufficient amount of collateral is required to guarantee loan recovery. There are two types of collateral: moveable and immovable. Everything from goods and stocks to plying automobiles is considered movable collateral. When we talk about immovable, we can talk about land that has buildings, fittings, or plant machinery attached to it.

e. Conditions

Even in the event that the loan is accepted, it will do so subject to a number of terms and restrictions. Certain loan terms are the same for all loans; for example, you must get hazard insurance for the full amount of the mortgage loan and list the lender as an insured party on the insurance policy. There can be additional terms unique to your loan.

2.1.5 Credit Collection Techniques

Financial institutions require efficient credit collection strategies in any economic environment. Banks' cash flow can be improved by understanding how to motivate

consumers to make timely payments on their existing loans to financial institutions like banks. As a result, several collection strategies are used. Generally, loan clients are expected to make payments in cash, deposit funds, or maintain their installment repayment schedule in accordance with the terms of the agreement. The collection process gets increasingly individualized and rigorous as the loan account approaches its past due or late status. The fundamental methods are:

Telephone Calls

A call may be sent to the loan client to seek prompt repayment and account upkeep if the loan client misses the deadline.

Personal visits

Vesting his business and having a conversation with the client about the problem might prove to be a highly successful collection strategy in the event that the phone contact is not met with a positive answer.

Letters

If the efforts made up to this point have not resulted in a favorable reaction, a courteous letter reminding the customer of its promise ought to be sent. After this, letters should be sent out cautioning of the future consequences of the conduct committed. The initial stage in the collection procedure for past-due and unpaid loan obligations is to send collection letters.

Using Collection Agencies

Uncollectible accounts may be turned over by businesses to a collection agency or lawyer for collection. Usually highly expensive, the costs for this service could leave the firm with less than half of the accounts that are collected in this manner.

Legal Action

The strictest phase in the collecting procedure is going to court. It is an alternative to using a collection agency. Direct legal action is more costly and may result in the debtor filing for bankruptcy, which would limit future business opportunities without guaranteeing that the overdue money will be eventually received.

2.1.6 Review of NRB Directives Relating to Loan

The Nepal Rastra Bank publishes directives and circulars pertaining to banking and financial institution oversight and regulation. The Unified Directive No. 2 of 2077 pertains to the classification of loans, advances, and loan loss provisions.

Directive No. 2 Classification of Loan and Advance and Loan Loss Provision

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).

Directive No. 2 (2): Additional Conditions for "Pass Loan"

Following loan & advances are classified as pass loan.

- Loan made available with a fixed deposit receipt as collateral.
- Loan made available subject to the collateral of Nepal Rastra Bank bonds or Government of Nepal Securities. Nonetheless, NRB Bonds, Government of Nepal Securities, and loans made as extra security for fixed deposit receipts have to be categorized under Section (1) of Directive No. 2.

Directive No. 2 (3): Additional Conditions for "Bad Loan (Loss)"

Bad loans are those advances and loans that have the following disparities and whose installments (repayments) are either past due or not at all.

- The borrower has filed for or was declared bankrupt.
- The borrower is now unreachable.
- Financial mismanagement.
- The project is not yet operational or is not practical for operation.
- The Letter of Credit, Guarantee, and other potential liabilities have not been settled ninety days following the loan's conversion to a forceful arrangement.
- Loan supplied to blacklisted person, firm.
- The loan is given in exchange for subpar collateral, which is collateral whose market value is less than the total amount owed.
- Purchased and discounted bills are not paid off within ninety days of the due date.
- The borrower filed two separate financial reports for the same fiscal year.

Directive No. 2 (4): Additional Agreement in Respect of "Term" Loan

Regarding term loans, the categorization will be based on the past due time of past due installments and will be applied to the total amount owed.

Loan Loss Provision

Based on the outstanding loans, advances, and bill purchases classified in accordance with these guidelines, the loan loss provisions will be given as follows:

Table 1

Loan Loss Provision

S.N.	Classification of loan	Loan loss provision
1.	Pass	1%
2.	Watch List	5%
3.	Sub-standard	25%
4.	Doubtful	50%
5.	Loss	100%

Source: NRB Directive, 2023

"General Loan Loss Provision" refers to the loan loss provision put aside for performing loans, while "Specific Loan Loss Provision" refers to the loan loss provision made aside for non-performing loans. The entire amount of such additional provisioning may be included in General Loan Provision under the supplemental capital if the banks provide for loan loss provisioning above the proportionate level required by the NRB regulations.

Directive No. 2-9 (5): Additional Provisioning in the case of Personal & Corporate Guarantee Loan

Assets equal to the personal guarantee and not claimable by anyone else must be produced if the loan is only provided as security for a corporate guarantee or personal guarantee. These loans will be categorized as mentioned above, and if they fall into the pass, sub-standard, or dubious categories, an additional 20% point provision will be made in addition to the ordinary loan loss provision that applies to that group. Such loan advances must be classified and prepared individually. Therefore, for the personal/corporate guarantee loan, the required loan loss provision will be 21%, 45, and 70% for the pass, substandard, and questionable categories, respectively.

Directive No. 2 (8): Rescheduling and Restructuring of Loan

Banks may only reschedule or restructure loans and advances that fall into the substandard, doubtful, or loss categories after receiving a formal plan of faction from the borrower with the following justification:

- The factors both internal and external to the decline in loan quality.
- The lower level of risk inherent in the borrower/enterprise ascertained by examining its profit and loss statement and balance sheet to project future cash flows, estimate recent cash lows, and forecast future ones, as well as evaluate market conditions.
- Proof that there is sufficient loan documentation in place
- An assessment of the management of the borrower/enterprise, with a focus on effectiveness, dedication, and adherence to strict business principles.

Directive No. 2- 9(2): Loan Loss Provisioning in Respect of Rescheduled, Restructured

- Loan loss provisioning must be provided at least 12.5% for all types of rescheduled or restructured credit, with the exception of the priority sector, if the credit comes within the pass category per NRB regulations.
- With regard to swapped loans, the bank accepting the loans in swapping is required to provide loan loss provision classifying the loans under the same classification as were existing.
- In case of rescheduling, restructuring, or swapping of insured or guaranteed priority sector credit, the loan loss provisioning shall be provided at one-fourth of the percentage mentioned in clause (a). The bank that is receiving the loan in switching must get confirmation of the current categorization from the bank or financial institution in question.

Directive No. 2 -9 (3): Provisioning Against Priority Sector Credit

Complete provisioning in accordance with standard loan loss provisions will be applied to the uninsured priority and deprived sector loans. Nonetheless, the necessary provisioning for insured loans must account for 25% of the typical loan loss provisioning percentage. In the event of insured priority/deprived sector credit, the following provisions is necessary:

Table 2

Provisioning Against Priority Sector Credit

Pass	0.25%
Watch List	1%
Sub standard	5%
Doubtful	12.5%
Loss	25%

Source: NRB Directives 2023

Should insured or guaranteed priority sector credit be rescheduled, reorganized, or switched, the percentage of loan loss provision would be 3.125% (i.e., 25% of 12.5%).

An asset or borrower's account that has been designated by a bank or other financial organization as sub-standard, questionable, or loss asset in compliance with the asset classification rules or instructions provided by NRB is referred to as a non-performing asset. If a payment is not made within 30 days of the due date, it is considered "past due" under any credit facility. As a result of advancements in the payment and settlement systems, the state of the economy, technological advancements in the banking sector, and other factors, the decision was made to eliminate the notion of "past due," effective March 31, 2023. Thus, as of that date, an advance would be considered a non-performing asset (NPA) if:

- In the case of a term loan, interest and/or principal payments are past due for a longer than 180-day period.
- In regards to an overdraft cash credit (OD/CC), the account stays "out of order" for a duration exceeding 180 days.
- For bills that have been purchased and discounted, the bill is still past due for more than 180 days.
- Any amount due for other accounts is past due for more than 180 days.
- Interest and/or principal installments are past due for two harvest seasons.
- But not for longer than two and a half years in the case of an advance granted for agricultural purposes.

2.2 Empirical Review

2.2.1 Review of Journals and Articles

Bhattarai (2016) in his article entitled "Effect of credit risk on the performance of Nepalese commercial banks" 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.

Otieno and Nyagol (2016) in their article entitled "Relationship between credit risk management and financial performance: empirical evidence from microfinance banks in Kenya" has evaluated relationship between credit risk management and financial performance of Microfinance banks in Kenya. The following were the specific objectives: to find the link between the performance of MFBs and the Portfolio at Risk (PAR) and the Loan Loss Provision Coverage Ratio (LLPCR). The study employed a longitudinal research methodology using panel data spanning the years 2011 to 2015. Twelve MFBs with licenses made up the target population. Six MFBs were sampled using the method of purposeful sampling. The MFB's financial reports were the source of secondary quantitative data collected using the document analysis guide. To illustrate the trajectory of MFB risk exposure and performance, descriptive statistics were employed. The degree of relationship and strength between the variables was ascertained using Pearson correlation. A multiple regression model was estimated using panel data analysis based on the system GMM technique, and the significance of the association between risk management and financial performance was tested. Regression coefficient of -0.2 calculated by GMM showed a substantial negative link with both ROAA and ROAE performance measures. The results showed that credit risk management with PAR and LLPCR parameters had a strong negative correlation (r=-0.68). As a result, the study came to the conclusion that performance and credit risk management are significantly correlated, and that credit risk management affects MFB performance.

Maharjan et al. (2016) in his article entitled "The relationship between bank credit risk, liquidity and profitability in Nepalese commercial banks" has examined the relationship between bank credit risk, profitability and liquidity of commercial banks in Nepal. A pooled cross-sectional analysis of 120 observations from 20 Nepali commercial banks that supplied secondary data between 2008 and 2013 served as the study's foundation. The data was obtained from websites, bank annual reports, and banking and financial statistics made available by Nepal Rastra Bank. The return on assets, return on equity, and net interest margin were selected as dependent variables, whereas total debt to equity, loan to deposit, non-performing loan to gross loan, and less caution were chosen as independent factors. Regression models were computed for Nepal in order to investigate the relationship among bank credit risk, liquidity, and profitability. The average return on equity is 12.95 percent, and the average return on assets is 1.85 percent, according to the report. It is discovered that the average ratio of non-performing loans to gross loans is 2.96 percent. For loan to deposit and less caution, the beta coefficients were negative; however, for debt to equity and non-performing loan to gross loan, they were positive. At the 1 percent significance level, the coefficients were significant for non-performing loans to gross loans, debt to equity, and less caution. Thus, this study came to the conclusion that non-performing loans, loans to deposits, and a lack of caution are the main factors influencing credit risk profitability and liquidity of Nepalese commercial banks.

Shrestha (2017) in his article entitled "The impact of credit risk management on profitability: Evidence from Nepalese Commercial Banks" has examined the impact of credit risk management on profitability of Nepalese commercial banks. The dependent variables chosen are profitability as measured by return on equity and return on assets. The following ratios are considered independent variables: capital adequacy ratio, non-performing loan ratio, cost per loan asset, cash reserve ratio, assets growth ratio, and leverage ratio. The information was gathered from Nepal Rastra Bank's bank supervision reports as well as the annual reports of a few chosen commercial banks. Based on 126 observations from 18 Nepali commercial banks, the survey was conducted. In this instance, some diagnostic tests for the linear regression model assumption were provided, along with descriptive statistics and correlation analysis. The significance and importance of credit risk management on the profitability of Nepalese commercial banks are tested using estimated regression

models. The result shows a positive relationship between return on equity and return on assets and the capital adequacy ratio, cost per loan asset, and assets growth ratio. It suggests that the return on equity and the return on assets will increase with the capital adequacy ratio. In a similar vein, rising cost per loan asset causes returns on equity and assets to rise as well. Similarly, a greater assets growth ratio would result in a better return on equity and assets. The findings also indicate a negative relationship between return on equity and return on assets for the non-performing loan ratio, cash reserve ratio, and leverage ratio, indicating that a rise in the non-performing loan ratio is associated with a decline in these metrics. Similarly, higher cash reserve ratios would lead to lower returns on assets and equity. In a similar vein, worse return on equity and assets are the outcome of increased leverage ratios. On the other hand, when it comes to bank performance, the cash reserve ratio, leverage ratio, and non-performing loan ratio, the beta coefficient is negative. For the capital adequacy ratio, cost per loan asset, assets growth ratio, and bank performance, the beta coefficient is positive. The beta coefficient is significant for the capital adequacy ratio, non-performing loan ratio, assets growth ratio, and leverage ratio at the five percent significance level.

Annor and Obeng (2017) in their article entitled "Impact of credit risk management on the profitability of 6 selected commercial banks listed on the Ghana stock exchange" has assessed the impact of credit risk on profitability of commercial banks listed on the Ghana Stock exchange. The objective of the research is to determine how return on equity of banks listed on the Ghana Stock Exchange relates to credit risk indicators such as non-performing loans, loan loss provisions ratio, loan to asset ratio, and capital adequacy ratio. The Ghana Banking Survey for the years under consideration and the annual reports of the six chosen banks provided secondary data. Within the framework of panel estimation technique, the Random Effect Model was employed by the study. The study measured credit risk using return on equity (ROE), capital adequacy ratio, loan loss provisions ratio, non-performing loan ratio, and loan to asset ratio. 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. The report suggests

that in order to lessen their exposure to these risks, banks should carefully evaluate and manage credit risk indicators.

Poudel (2018) in his article entitled "Impact of credit risk on profitability of commercial banks in Nepal" analyzed 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.

Munangi and Sibindi (2020) in their article entitled "Impact of credit risk on the financial performance of South African banks" has employed to test the relationship between credit risk and financial performance (proxied by non-performing loans

(NPLs) and by return on assets (ROA) or return on equity (ROE) respectively). The results of the research proved that there was a negative correlation between credit risk and financial performance. Therefore, the bank's profitability decreases as the percentage of non-performing loans increases. Furthermore, the research demonstrated that expansion positively impacted financial outcomes. This suggests that bank development improves production capability. Thirdly, a positive correlation between capital adequacy and financial performance was discovered. A bank may become more competitive if its capital adequacy ratio is higher. On the other hand, a high capital base may be interpreted as a sign of indolence or as a use of resources that may have been better used for other ventures. Fourthly, there was no clear correlation between size and financial success discovered by the study. Finally, the analysis discovered a negative correlation between bank leverage and financial performance. The results of the study suggest that banks should implement strict and cautious credit rules on a small scale to reduce the number of non-performing loans. To reduce the danger of bank collapse, authorities must, on a macro level, strengthen supervision over banks to make sure they manage their credit risk in compliance with the law.

Biswas, Nath, Biswas and Rashid (2021) in their article entitled "Effect of credit risk on commercial banks' profitability: a case study of Bangladesh" has 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. According to the study, Nepalese commercial banks should prioritize scientific credit risk management, improve their efficacy in credit analysis and loan management, and lower the high percentage of non-performing loans and their negative effects on financial performance in order to secure as much of their assets as possible.

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. Therefore, it is recommended that banks closely monitor the performance of loans and thoroughly review clients' credit histories and ability to repay debts before approving loan applications in order to improve financial performance and reduce the risk of non-performing loans in the future.

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.

Shrestha (2022) in his article entitled "Effect of credit risk on profitability of Nepalese commercial banks" has 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.

2.2.2 Review of Previous Thesis

Lamsal (2017) in his thesis entitled *Impact of credit risk on profitability of commercial banks in Nepal* has examined the quantitative effect of credit risk on the profitability of commercial banks in Nepal, considering variables related to lending activities. The dependent variable in the empirical investigation, return on assets (ROA), is an accounting statistic that represents bank profitability. Essentially, the study employs both descriptive and econometric techniques. Multiple linear regression models are used to ascertain the relative weighting of the previously mentioned independent factors on a dependent variable. The study found that the performance of banks was highly influenced by a variety of chosen variables, including bank size, loan to total asset, provision to total loans, and credit administration (cost to total loans). However, their influence on the selected profitability indicator, or return on asset, varies in both intensity and direction.

Yadav (2018) in his thesis entitled *Credit risk management and its impact on profitability of Nepalese commercial banks* has assessed credit risk management and its impact on profitability of Nepalese commercial banks. Regression analysis, correlation, mean, and coefficient of variation were used in this investigation. Return on assets (ROA) and return on equity (ROE) have been used as indications of profitability, while the non-performing loan ratio (NPLR), capital adequacy ratio (CAR), and loan and advance to deposit ratio (LTDR) have been employed as indicators of credit risk management. The results showed that the profitability of Nepalese commercial banks is significantly impacted by credit risk management. The outcome demonstrated that the capital adequacy ratio increased banks' profits. On the other side, it was discovered that the profitability was severely impacted by the non-performing loan ratio and the loan to advance to deposit ratio. Thus, this study came to the conclusion that a key indicator of a bank's profitability is its credit risk management. As a result, the bank's capacity to control credit risk determines its profitability.

Rai (2019) in his thesis entitled *Credit practices of commercial banks in Nepal* has analyzed the credit position of sample commercial banks. Secondary data were employed in this investigation. This study discovered that Nabil's total obligation to total assets has the highest ratio when measuring lending strength in relative terms. The other two banks' performances, however, have not strayed too far from the combined average and the mean ratio of Nabil. Nabil has the lowest ratio of loans and advances to total assets due to its propensity to invest in government securities. The bank has offered loans and advances at a steady and substantial rate all year long. The percentage of total deposits utilized to boost bank revenue, regardless of the application portfolios, is assessed by the ratios of loans and advances and investments to deposits. The largest percentage of Nabil's total deposits have been used for earning operations; this ratio is far higher than that of the other two banks. The mean ratio of Nabil and Himalayan is significantly different from the combined ratio. This demonstrates that Nabil performs noticeably better than Himalayan in fund-raising operations. Because of its low share capital, reserves, and surplus in its capital composition, HBL has the lowest volume of net assets. However, in terms of loans and advances, HBL's contribution is far greater than its net assets. Throughout the study period, Nabil has contributed the most loans and advances overall. Nabil has

made the greatest contribution to the industrial and productive sectors of the economy. This analysis has also shown that Nabil has the best overall liquidity strength of all the banks. The greatest likely danger, though, is the liquidity risk brought on by the interest rate in Nabil.

Khadka (2021) in his thesis entitled *Impact of credit risk on profitability of commercial banks in Nepal* has examined the impact of credit risk on profitability of commercial banks in Nepal. Twenty-eight commercial banks that are now in operation in Nepal made up the study's population; five of these institutions were selected as a sample. The secondary data were gathered during 2007–2008 and 2016–17. The data were analyzed using multiple regression analysis, correlation, and descriptive statistics. The dependent variables chosen are profitability as measured by return on equity and return on assets. The following ratios are considered independent variables: capital adequacy ratio, non-performing loan ratio, loan and advance to deposit ratio, and loan loss provision ratio. The study showed that the non-performing loan ratio, which gauges credit risk, had a little detrimental effect on banks' bottom lines. The profitability of banks is also impacted by the loan to deposit and advance to deposit ratios. Additionally, the profitability of banks is significantly enhanced by the capital adequacy ratio and loan loss provision ratio.

Singh (2022) in his thesis entitled *Impact of credit risk management on profitability of commercial banks* has investigated relationship between credit risk management and profitability of commercial banks in Nepal. The investigation of whether the link is constant or erratic was another goal of this study. The study model defines NPLR and CAR as proxies of credit risk management and ROE and ROA as proxies of profitability. To see if the association is real, a number of statistical tests are run. To find out if the association is stable or not, more statistical tests are run. The results showed that credit risk management does increase commercial banks' profits. When comparing the two credit risk management proxies, ROE and ROA were significantly impacted by NPLR and insignificantly impacted by CAR. All of the proxies' associations, nevertheless, were erratic rather than constant.

Sharma (2022) in his thesis entitled *Impact of credit risk on profitability of commercial banks in Nepal* has examined the impact of credit risk on profitability of

twenty six 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. Multiple Regression is the data analysis method employed in this study. The findings indicated that while ROA and NPLR had a negative association, there was a strong and positive link between ROA and CAR, LPNPL. ROA was significantly impacted by CAR, NPLR, and LPNPL. The credit risk indicator that predicted the bank's profitability the best was NPLR; CAR and LPNPL were not very good at doing so. Because of this, banks should concentrate on credit risk management to lower non-performing loan levels and increase profitability.

Rana (2022) in his thesis entitled *Impact of credit risk management on the profitability of selected commercial banks in Nepal* has tried to find out how the credit risk management affects the profitability in the seven sample selected commercial banks using a balanced panel data from 2013-2018 and 35 observations have been used for the analysis. The main objective of the research was to characterize how credit risk management affected the profitability of Nepal's seven commercial banks. The study solely employed a quantitative methodology, concentrating on describing the SPSS results and doing empirical analysis using a regression model. The researcher classified loan loss provision, liquidity, operating inefficiency, loan growth, and capital adequacy ratio as credit risk management indicators in the model, and ROE as a profitability indicator. The findings of the regression analysis showed that the profitability of banks (Return on Equity) is positively and statistically significantly impacted by loan growth, operating inefficiencies, and loan loss provision. Ultimately, the findings show that the banks' return on equity was negatively yet statistically significantly correlated with liquidity and capital adequacy.

Bhattarai (2023) in his thesis entitled *Impact of credit risk management on profitability of Nepalese commercial banks* has investigated how credit risk management impact on the profitability of commercial banks of Nepal. Therefore, the primary objective of this research is to evaluate how risk management affects Nepal's commercial banks' profitability. This study specifically aimed to determine the financial performance indicators of Nepalese commercial banks and the correlation between risk management variables and financial performance indicators. Multiple

regression analysis and correlation were used in this investigation. The results showed that the profitability of Nepalese commercial banks is significantly impacted by credit risk management. The findings indicated that bank size, capital adequacy ratio, and coverage ratio all positively affect profitability. Conversely, it has been discovered that the non-performing loan ratio, the leverage ratio, and the presence of female board members adversely affect bank performance. Nevertheless, it was found that the cash reserve ratio, asset quality, and liquidity ratio had no discernible effects on the profitability of the bank.

2.3 Research Gap

The term "research gap" describes the knowledge gap pertaining to earlier investigations. Numerous experts, researchers, and students have undertaken a number of studies on credit risk management. They carried out research on credit risk management in banks and government agencies. There is a research gap between the current study and earlier studies in the sample banks and fiscal years, or time period. Several methods that were not employed in earlier research, such as regression analysis, correlation analysis, and descriptive analysis, are included in this study. In this study regression analysis has conducted to find out the impact of credit risk management on profitability of the banks and also the effort has been done for the effect of cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio and bank size into the credit of the banks, which are not included in the previous studies on this topic. This research pinpoints on this aspect. So, this study has fulfilled the gap.

CHAPTER - III
RESEARCH METHODOLOGY

3.1 Research Design

A research design is a comprehensive plan, scheme, or program. This study follows descriptive and causal research design. Descriptive research design is used to analyze the position and status of credit risk and profitability of commercial banks whereas causal research design is used to analyze the relationship and impact of independent variables (credit risk) on dependent variable (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, four commercial banks i.e. SBI, NABIL, NMB and GIBL are selected as sample for the study of credit risk on the basis of judgment or purposive sampling method. In this present situation, these commercial banks are supposed to be leading commercial banks of Nepal due to earning profit though these banks try to get success in competitive market form respective way by managing credit because credit is the major function of every commercial bank. That's why, the researcher has chosen these banks.

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

Secondary data for this study were obtained from linked offices' webpages and annual 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 include numerous theses connected to this subject and NRB reports.

3.4 Method of Analysis

Various analytical methods can be employed to determine a firm's true financial status. It is true that the analysis is more significant and successful for reaching these goals when appropriate or acceptable tools are employed, depending on the kind of statement and data. Generally speaking, two types of tools may be utilized:

financial and statistical. Regression analysis and financial analysis are therefore used in this work to meet the goal of assessing the sample banks' credit and liquidity risks.

3.4.1 Descriptive Statistic

Numerical summaries and descriptions of data are known as descriptive statistics. The information gathered from an experiment, survey, historical record, etc. is referred to as "data." The following list contains statistical methods that were utilized in this study to more precisely analyze the data:

Arithmetic Mean

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. The formula for calculating mean is:

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

Where,

ΣX = Sum of given Observation

n = No. of Observation

Standard Deviation

The standard deviation is the absolute measure of dispersion in which the fault evident in other measures of dispersion is present since it satisfies most of the conditions for a good measure of dispersion. A higher standard deviation There will be more variability, and vice versa. The amount that the data vary from the center value is measured by dispersion. Stated differently, it is useful to assess the variability of the data to determine its quality. All computed ratios, such as the interest rate spread, inflation rate, loans and advances, total deposit, and current ratio, have their standard deviation determined using it. It is calculated in this way:

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

3.4.2 Inferential Statistics

Coefficient of Correlation (r)

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 related that changes in one variable's value are caused by changes in the value of another.

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

3.4.3 Regression 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. The relationship between the explanatory factors and the dependent variables (bank profitability variables), such as return on equity (ROE) and return on assets (ROA), is evaluated using regression analysis. 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). So, 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

$LEV_i t$ = Leverage 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)

$\beta_1, \beta_2, \beta_3, \beta_4 \beta_5$ = 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.

Independent variables

```
┌─────────────────────────────┐
│     Cash Reserve Ratio      │
└─────────────────────────────┘
┌─────────────────────────────┐          **Dependent variables**
│   Credit to Deposit Ratio   │
└─────────────────────────────┘      ┌──────────────────────────┐
┌─────────────────────────────┐      │   Bank Profitability     │
│  Non-performing Loan Ratio  │      │                          │
└─────────────────────────────┘      │      (ROA, ROE)          │
┌─────────────────────────────┐      └──────────────────────────┘
│       Leverage Ratio        │
└─────────────────────────────┘
┌─────────────────────────────┐
│         Bank Size           │
└─────────────────────────────┘
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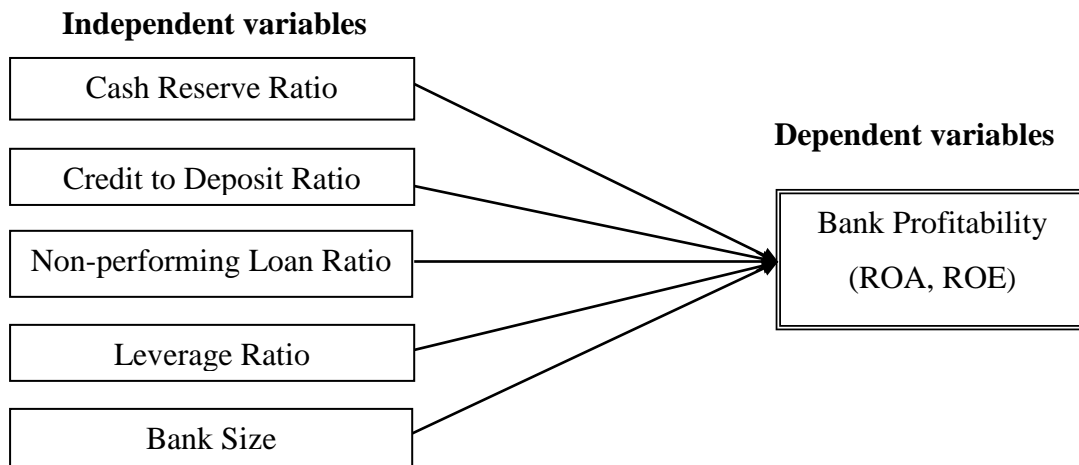
Source: Bhattarai (2016); Munangi and Sibindi (2020); Biswas, Nath, Biswas and Rashid (2021; Chhetri (2021) and Shrestha (2022)

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 Nepal's commercial banks between 2012–13 and 2021–22. 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 Position and Status of Credit Risk Indicators of Banks

Credit risk situations have been examined utilizing financial and statistical methods and the last ten years' worth of data from sample institutions. Through an analysis of the cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio, and bank size, this study looks at the profitability status of four commercial banks.

4.1.1.1 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 can control the amount of liquidity. Since raising the reserve requirement will 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 restrict the amount of money that could be spent and invested, which would prevent the economy from growing. In addition, banks can experience a decline in profitability as well as decreased interest rates.

Table 3

Cash Reserve Ratio

(In percent)

Year	NABIL	SBI	NMB	GIBL
2012/13	9.25	13.09	25.90	16.25
2013/14	13.26	12.21	16.87	14.80
2014/15	15.35	16.34	17.17	12.72
2015/16	9.31	15.93	15.72	11.57
2016/17	11.01	16.22	15.41	18.58
2017/18	10.26	12.58	12.34	8.06
2018/19	6.49	14.28	14.40	7.66
2019/20	11.82	12.65	15.35	9.04
2020/21	5.19	7.24	15.01	11.64
2021/22	5.60	6.10	11.56	8.21
Mean	9.75	12.66	15.97	11.85
SD	3.32	3.53	3.91	3.76
CV	34.00	27.91	24.49	31.73

Source: Appendix –I

Table 3 depicts that the cash reserve ratio of sample banks in Nepal. The cash reserve ratios of the sample institutions show a tendency to fluctuate. The maximum cash reserve ratio for the fiscal year 2012/13 was 25.90 percent of NMB, while the lowest ratio for the fiscal year 2020/21 was 5.19 percent of NABIL. The NMB average ratio is the highest, at 15.97 percent. The average cash reserve ratio is the lowest, at 9.75 percent of NABIL. It is meant to convey that NMB has a strong liquidity position and that the bank's daily operations go without a hitch. Nonetheless, the bank's profitability, interest income, and investment amount have all dropped as a result of its reduced ability to lend money. NABIL has the lowest standard deviation of all the sample banks, which suggests the lowest degree of risk. Based on the ratios, NMB has shown to be the most consistent, having the lowest coefficient of variation (CV) of 24.49 percent.

4.1.1.2 Credit to Deposit Ratio

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. One measure of profitability is the loan to deposit ratio (CDR). For banks, the difference is the amount that leaves (loans) and

the amount that comes in (deposits). As long as the loans are used to secure debtors, the bank's borrowed amount yields a higher interest rate.

Table 4

Credit to Deposit Ratio

(In percent)

Year	NABIL	SBI	NMB	GIBL
2012/13	72.90	48.86	74.33	76.84
2013/14	72.55	64.74	75.56	79.89
2014/15	62.84	77.44	74.31	81.32
2015/16	69.02	72.03	81.85	79.29
2016/17	75.59	77.27	83.52	77.49
2017/18	83.56	86.50	88.48	86.71
2018/19	81.25	88.46	93.18	90.79
2019/20	79.72	84.08	89.26	87.37
2020/21	90.63	90.39	93.84	84.35
2021/22	94.23	89.05	96.77	93.82
Mean	78.23	77.88	85.11	83.79
SD	9.66	13.15	8.45	5.78
CV	12.34	16.88	9.93	6.90

Source: Appendix –I

Table 4 reveals that the credit to deposit ratio of sample banks in Nepal. The ratios of each bank exhibit a fluctuating tendency. NMB had the greatest credit to deposit ratio in fiscal year 2021/22, at 96.77 percent, while SBI had the lowest ratio in fiscal year 2012/13, at 48.86 percent. 85.11 percent is the NMB average ratio with the highest number. At 77.88 percent, SBI has the lowest average credit to deposit ratio of any bank. It is evident that NMB has achieved the greatest success in funding loans and advances with its whole deposit while turning a healthy profit. GIBL has the lowest standard deviation of all the sample banks, indicating that it carries the least amount of risk. Based on the coefficient of variation of the ratios, it can be deduced that GIBL has demonstrated the highest degree of consistency, with the lowest CV of 6.90 percent.

4.1.1.3 Non-performing Loan Ratio

The quality of the loan portfolio directly affects the performance of the bank. Losses from past-due loans are the bank's biggest risk. The best indicators of asset quality are hence nonperforming loan ratios. Various financial ratios are employed by various researchers to analyze bank performance. Maintaining a low percentage of

nonperforming loans is the top priority for all commercial banks. This is because a large percentage of nonperforming loans has an impact on the bank's performance. Thus, a bank's healthy portfolio is shown by a low ratio of nonperforming loans to total loans. The bank is performing better if the ratio is lower.

Table 5

Non-performing Loan Ratio

(In percent)

Year	NABIL	SBI	NMB	GIBL
2012/13	2.19	0.38	1.85	2.33
2013/14	2.30	0.26	0.55	2.62
2014/15	1.86	0.19	0.43	2.29
2015/16	1.17	0.14	1.86	1.94
2016/17	0.81	0.10	1.72	1.64
2017/18	0.54	0.20	0.89	0.78
2018/19	0.74	0.20	0.82	0.55
2019/20	0.99	0.23	2.72	1.78
2020/21	0.83	0.23	2.30	1.43
2021/22	1.62	0.15	1.46	1.29
Mean	1.30	0.21	1.46	1.67
SD	0.64	0.08	0.77	0.67
CV	48.96	36.78	52.48	40.36

Source: Appendix –I

Table 5 depicts that the non-performing loan ratio or credit risk of sample banks in Nepal. All banks' average ratios are less than five percent. The ratio of non-performing loans is as high as 2.72 percent of NMB in the 2019/20 fiscal year and as low as 0.10 percent of SBI in the 2016/17 fiscal year. 1.67 percent is the highest GIBL average ratio. The average non-performing loan ratio for SBI is the lowest at 0.21 percent. It is implied that SBI is the most performing or that SBI is maintaining its NPLs the best out of all of them, indicating that SBI has the lowest credit risk. It might get the inference that SBI keeps a close eye on loan usage and follows up on it. Out of all the sample banks, SBI has the lowest standard deviation, which suggests that it is the least risky. SBI has shown the highest degree of consistency based on the coefficient of variation of the ratios, with the lowest CV of 36.78 percent.

4.1.1.4 Bank 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. Performance has a good or negative connection. If managing a bank becomes more challenging as its size increases. On the other hand, because of the economies of scale that come with size, it has been determined that larger banks can raise capital more cheaply. It is therefore one of the key markers of the bank's financial performance.

Table 6

Bank Size (Total Assets)

(In natural logarithm)

Year	NABIL	SBI	NMB	GIBL
2012/13	4.86	4.81	4.40	4.59
2013/14	4.94	4.79	4.48	4.78
2014/15	5.06	4.77	4.62	4.84
2015/16	5.10	4.89	4.87	4.94
2016/17	5.15	5.00	4.94	5.07
2017/18	5.23	5.01	5.05	5.11
2018/19	5.30	5.07	5.13	5.18
2019/20	5.38	5.12	5.25	5.44
2020/21	5.46	5.14	5.36	5.54
2021/22	5.62	5.18	5.41	5.56
Mean	5.21	4.98	4.95	5.10
SD	0.24	0.15	0.36	0.33
CV	4.52	3.09	7.24	6.45

Source: Appendix –I

Table 6 represents that the bank size of sample banks in Nepal. The NMB bank had the lowest size in the fiscal year 2012/13 at 4.40, while the NABIL bank had the biggest size in the fiscal year 2021/22 at 5.62. The highest average bank size in NABIL is 5.21. The NMB's lowest average bank size is 4.95. It demonstrates that Nepal's average bank size throughout the research period was the biggest, according to NABIL. The bank can save costs as a result of the economies of scale that arise from this. Large banks can also raise funds more affordably. Out of all the sample banks, SBI has the lowest standard deviation, which suggests that it is the least risky. SBI has been the most stable in the ratios, with the lowest coefficient of variation (CV) of 3.09 percent, according to the data.

4.1.1.5 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.

Table 7

Leverage Ratio

(In percent)

Year	NABIL	SBI	NMB	GIBL
2012/13	9.95	16.06	9.37	11.08
2013/14	10.42	12.46	9.74	8.80
2014/15	11.23	9.50	11.54	8.45
2015/16	9.98	10.35	9.87	9.07
2016/17	8.96	8.58	7.17	9.31
2017/18	7.21	7.01	5.77	8.49
2018/19	7.67	7.36	6.78	4.26
2019/20	8.19	7.96	7.57	8.50
2020/21	7.60	7.95	8.67	9.56
2021/22	6.92	7.95	8.50	8.55
Mean	8.81	9.52	8.50	8.61
SD	1.50	2.81	1.72	1.72
CV	17.07	29.58	20.19	20.02

Source: Appendix –I

Table 7 shows that the leverage ratio of commercial banks in Nepal. SBI's highest leverage ratio during the 2012/13 fiscal year was 16.06 percent. GIBL's lowest leverage ratio for the 2018/19 fiscal year is 4.26 percent. 9.52 percent is SBI's highest average leverage ratio. NMB's average leverage ratio is the lowest at 8.50. It suggests that, in comparison to the owners, SBI displays a significant portion of funding provided by creditors. Given that SBI has the greatest debt-to-equity ratio among the creditors, it would be problematic for them. Among the sample banks, NABIL has the lowest standard deviation, indicating the lowest level of risk. Based on the coefficient of variation of the ratios, NABIL has demonstrated the highest degree of consistency, with the lowest CV of 17.07 percent.

4.1.2 Profitability Position and Status of Banks

Using financial and statistical techniques, profitability (i.e., ROA and ROE) situations have been examined using historical 10-year data from sample banks. Through an analysis of each bank's return on equity (ROE) and return on total assets (ROA), this study looks at the profitability position of four commercial banks.

4.1.2.1 Return on Assets (ROA)

Return on assets, or ROA, was one important indicator used to compare the financial performance of banks. Return on assets (ROA) is a financial metric that shows how much profit (or return) a bank makes in comparison to all of its resources. The return on assets, or ROA, is calculated by dividing the net income for the year by the total assets, which is usually the average value for the year. The ability of a bank's management team to make money off of the resources the bank employs for its operations is gauged by the ROA.

Table 8

Return on Assets

(In percent)

Year	NABIL	SBI	NMB	GIBL
2012/13	3.03	1.19	1.43	1.15
2013/14	2.66	1.51	1.36	1.62
2014/15	1.81	1.80	1.21	1.39
2015/16	2.21	1.70	1.56	1.58
2016/17	2.57	1.54	1.81	1.72
2017/18	2.36	1.97	1.66	1.63
2018/19	2.11	1.94	1.67	1.82
2019/20	1.46	1.17	0.95	1.06
2020/21	1.56	0.70	1.17	1.21
2021/22	1.01	1.07	1.29	1.38
Mean	2.08	1.46	1.41	1.46
SD	0.62	0.42	0.27	0.26
CV	29.81	28.57	18.84	17.71

Source: Appendix –I

Table 8 shows that the return on assets of sample banks in Nepal. The highest return on assets, 3.03 percent of NABIL, occurred in the fiscal year 2012/13; the lowest return, 0.70 percent of SBI, was recorded in the fiscal year 2020/21. The highest average return on assets for NABIL is 2.08 percent. The lowest average return on assets for NMB is 1.41 percent. The fact that NABIL possessed the highest

percentage among them implies that they were able to exert total control over their operations. Stated differently, NABIL optimizes the return on its assets by maximizing the utilization of the asset that contributes most to the overall mean of ROA. Out of all the sample banks, GIBL has the lowest standard deviation, meaning that it is the least risky. Based on the coefficient of variation of the ratios, it can be deduced that GIBL has demonstrated the highest degree of consistency, having the lowest CV of 17.71 percent.

4.1.2.2 Return on Equity (ROE)

Return on equity is the other indicator used to evaluate profitability success. The return on equity (ROE) ratio is the most commonly utilized internal performance metric of shareholder value. Return on equity is the sum paid to shareholders on their equity. A measure of a business's profitability called return on equity illustrates how much money a bank produces with the cash that its shareholders have invested. The percentage of shareholders' equity that the net income produced was represented as.

Table 9

Return on Equity

(In percent)

Year	NABIL	SBI	NMB	GIBL
2012/13	33.17	20.29	14.85	13.90
2013/14	30.36	20.35	14.58	15.90
2014/15	22.07	18.86	15.20	13.12
2015/16	24.31	19.25	17.01	15.87
2016/17	25.63	14.78	14.82	17.75
2017/18	19.34	15.81	11.24	15.47
2018/19	18.28	16.20	12.97	9.58
2019/20	13.39	10.44	8.18	10.09
2020/21	13.37	6.25	11.32	12.73
2021/22	8.03	9.57	12.25	13.14
Mean	20.80	15.18	13.24	13.75
SD	7.91	4.92	2.56	2.60
CV	38.04	32.44	19.37	18.88

Source: Appendix –I

Table 9 reveals that the return on equity of sample banks in Nepal. NABIL had the highest return on equity in the fiscal year 2012/13, with 33.17 percent, while SBI had the lowest return in the fiscal year 2020/21, with 6.25 percent. NABIL has the greatest average return on equity, at 20.80 percent. NMB has the lowest average return on

equity, at 13.24 percent. The theory is that the NABIL's return on equity represents the best or most profitable management out of all of them. Another way to put it is that NABIL is becoming more profitable and surpassing its rivals. Of all the sample banks, NMB has the lowest standard deviation, indicating that it is the least hazardous. Based on the coefficient of variation of the ratios, it can be deduced that GIBL has demonstrated the highest degree of consistency, having the lowest CV of 18.88 percent.

4.1.3 Descriptive Statistics of Variables

Table 10 presents the descriptive statistics for the variables utilized in the investigation. The outcome demonstrates the lowest and greatest performance measures for Nepal's commercial banks in terms of the profitability indices ROE and ROA, as well as other independent variables.

Table 10

Descriptive Statistics of Variable of Banks

Variables	N	Minimum	Maximum	Mean	Std. Deviation
CRR	40	5.19	25.90	12.5610	4.16485
CDR	40	48.86	96.77	81.2520	9.81408
NPLR	40	0.10	2.72	1.1595	0.81340
LEV	40	4.26	16.06	8.8590	1.96928
LSIZE	40	4.40	5.62	5.0610	0.28997
ROA	40	0.70	3.03	1.6010	0.48807
ROE	40	6.25	33.17	15.7430	5.68852

Source: Appendix –II

Table 10 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 12.5610 percent during the course of the research, a standard deviation of 4.16485 percent, a maximum of 25.90 percent, and a minimum of positive 5.19 percent. Similarly, the ratio of credit to deposit, the second independent variable, exhibits variation ranging from 48.86 percent to 96.77 percent, with an average of 81.2520 percent and a standard deviation of 9.81408. The non-performing loan ratio, which is the third independent variable, has a standard deviation of 0.81340 and an average of 1.1595 percent, ranging from a minimum of 0.10 percent to a maximum of 2.72 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%. Commercial banks also have sound credit policies. The leverage ratio varied at the same time, from 4.26 to 16.06 percent. Then, with a low standard deviation of 1.96928, the average leverage ratio is 8.8590 percent. The control variable, which is the total assets or bank size, has a mean of 5.0610 and a standard deviation of 0.28997. Its range is 4.40 to 5.62. According to ROA, the greatest return on assets is 3.03 percent, the minimum is 0.70 percent, and the average return on assets for the research period is 1.6010 percent with a standard deviation of 0.48807 percent. With a standard deviation of 5.68852, the ROE mean ranges from a low of 6.25 percent to a maximum of 33.17 percent.

4.1.4 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 11, the correlation matrix is displayed as follows.

Table 11

Pearson Correlation Coefficients of Study Variables

	CRR	CDR	NPLR	LEV	LSIZE	ROA	ROE
CRR	1						
CDR	-.361*	1					
NPLR	.202	.056	1				
LEV	.321*	-.828**	.047	1			
LSIZE	-.678**	.594**	.002	-.454**	1		
ROA	-.047	.278	-.019	-.040	-.133	1	
ROE	.117	.656**	-.093	.484**	-.334*	.845**	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 11 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 negative relation with ROA in 5 percent level of significance. At the same time, cash reserve ratio (CRR) has also insignificant positive relation with ROE. Likewise, there is insignificant positive correlation between credit to deposit ratio (CDR) and ROA and 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 insignificant negative relationship with ROA and significant negative relationship with ROE of the banks.

4.1.5 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 12

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.593[a]	.352	.257	.42077

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

Source: Appendix-IV

The R square is 0.533. This means that the independent variables (LSIZE, NPLR, LEV, CRR, and CDR) explain 53.30 percent of the variation in the dependent variable (ROA). The R value in this study, which is 0.658, 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 13

Analysis of Variance (ANOVA)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.271	5	.654	3.695	.009[b]
	Residual	6.020	34	.177		
	Total	9.290	39			

a. Dependent Variable: ROA

b. Predictors: (Constant), LSIZE, NPLR, LEV, CRR, 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 3.695 (p = 0.009ˆ0.05) for the ROA proxy variables LSIZE, NPLR, LEV, CRR, and CDR indicate a strong statistical correlation between the dependent variable (ROA) and the independent variables.

Table 14

Regression Coefficient of Independent Variables with ROA

Variables	Coefficients	t-statistics	p-value	Collinearity Statistics	
				Tolerance	VIF
(Constant)	8.438	3.860	.000		
CRR	-.025	-1.075	.290	.494	2.023
CDR	.053	-3.842	.001	.245	4.090
NPLR	-.098	1.127	.268	.902	1.109
LEV	-.220	-3.528	.001	.301	3.319
LSIZE	-.071	-.189	.851	.386	2.590

Source: Appendix-IV

Table 14 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 tolerance values were above 0.1 and VIF below 10. That's why, there is no multicollinearity in the model.

The cash reserve ratio (CRR) and ROA have a negative association, according to the regression model's results, with a coefficient estimate of -0.025. This indicates that, provided other factors remain constant, a one percent rise in the cash reserve ratio results in a -0.025 percent fall in the banks' return on assets (ROA). The p value of

0.290 indicates that this relationship is statistically insignificant at the five percent significance level. This indicates that the cash reserve ratio has an insignificant negative effect on the sample banks' ROA.

The credit to deposit ratio (CDR), with a coefficient estimate of 0.053, 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 0.053 percent. The CDR's p value of 0.001 indicates that it is statistically significant at the five percent significance level. Therefore, the ROA of the sample banks is significantly 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 -0.098. 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 -0.098 percent. The NPLR's p value of 0.268 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 significant negative impact on the ROA of the sample banks is therefore supported by the results.

Leverage ratio (LEV) and ROA have a negative association, according to the regression result, with a coefficient estimate of -0.071. This indicates that, while all independent variables are held constant, a one percent rise in the leverage ratio results in a -0.071 percent decline in the banks' return on assets (ROA). The leverage ratio's p value of 0.851 indicates that it is statistically insignificant at the five percent significance level. Leverage ratio therefore has a statistically insignificant negative impact on banks' return on assets (ROA).

The results of the regression model show that bank size (LogSize) and ROA have a negative connection, with a coefficient estimate of -1.757. This demonstrates that, when all other independent variables are held constant, a one percent increase in bank size (LogSize) results in a -1.757 percent reduction in the banks' return on assets (ROA). The bank size's p value of 0.000 indicates that this link is statistically

significant at the five percent significance level. As a result, bank size (LogSize) has a substantial negative influence on banks' return on assets (ROA).

Table 15

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.701[a]	.491	.416	4.34570

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

Source: Appendix- V

The R square is 0.491. This means that the independent variables (LSIZE, NPLR, LEV, CRR, and CDR) explain 49.10 percent of the variation in the dependent variable (ROE). The R statistic in this study, which is 0.701, 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 16

Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	619.917	5	123.983	6.565	.000[b]
	Residual	642.094	34	18.885		
	Total	1262.011	39			

a. Dependent Variable: ROE
b. Predictors: (Constant), LSIZE, NPLR, LEV, CRR, 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 17

Regression Coefficient of Independent Variables with ROE

Variables	Coefficients	t-statistics	p-value	Collinearity Statistics	
				Tolerance	VIF
(Constant)	69.543	3.080	.004		
CRR	-.274	-1.152	.257	.494	2.023
CDR	.526	-3.668	.001	.245	4.090
NPLR	-1.365	1.515	.139	.902	1.109
LEV	-.657	-1.020	.015	.301	3.319
LSIZE	-.671	-.174	.863	.386	2.590

Source: Appendix- V

Table 17 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 tolerance values were above 0.1 and VIF below 10. That's why, there is no multicollinearity in the model.

The cash reserve ratio (CRR) and ROE have a negative association, according to the regression model's results, with a coefficient estimate of -0.274. 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 -0.274 percent. The p value of 0.257 indicates that this relationship is statistically significant at the five percent significance level. Thus, the cash reserve ratio has an insignificant negative impact on the sample banks' return on equity.

The credit to deposit ratio (CDR), with a coefficient estimate of 0.526, 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 0.526 percent. The CDR's p value of 0.001 indicates that it is statistically significant at the five percent significance level. Therefore, the sample banks' ROE is significantly positively impacted by the credit to deposit ratio (CDR).

The non-performing loan ratio (NPLR) and ROE have a negative association, according to the regression results, with a coefficient estimate of -1.365. 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 a percentage of one. The NPLR's p value of 0.139 indicates that it is statistically significant at the five percent significance level. Therefore, the non-performing loan ratio (NPLR) positively affects the sample banks' ROE in a statistically significant way.

Leverage ratio (LEV) and ROE have a negative association, according to the regression result, with a coefficient estimate of -0.657. This indicates that, while keeping all independent variables constant, a one percent rise in the leverage ratio results in a -0.657 percent decline in the banks' return on equity. The leverage ratio's p value of 0.015 indicates that it is statistically significant at the five percent significance level. Leverage ratio thus has a statistically significant negative impact on banks' return on equity.

The results of the regression model show that bank size (LogSize) and ROE have a negative association, with a coefficient estimate of -0.671. This demonstrates that, when all other independent variables are held constant, a one-unit increase in bank size (LogSize) results in a -0.671-unit decrease in the banks' return on equity (ROE). The bank size (LogSize) p-value of 0.863 indicates that this correlation is statistically insignificant at the five percent significance level. Consequently, the relationship between bank size (LogSize) and return on equity (ROE) is not very strong.

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) is found to have negative and insignificant relationship with ROA of banks which is consistent with the finding of Shrestha (2017) but opposite to the finding of Bhattarai (2016) which observed that there is insignificant relationship between cash reserve ratio and ROA of the banks. At the meantime, cash reserve ratio has insignificant 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 insignificant positive correlation between credit to deposit ratio and ROA which is not similar with the prior study of Shrestha and Niroula (2021) and also significant positive relationship between credit to deposit ratio and ROE which is not consistent 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 findings is similar with the findings of Shrestha (2017) which observed that non-performing loan had significant positive relationship with ROA of the banks. However, it contradicts with the finding of Bhattarai (2016); Biswas, Nath, Biswas and Rashid (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 insignificant 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 negative impact on ROA of banks. This is consistent with the finding of Shrestha (2017); Shrestha (2022) but opposite to the finding of Bhattarai (2016); Biswas et al. (2021) concluded that insignificant positive impact of cash reserve ratio on ROA of the banks. At the sometime, loan to deposit ratio has significant 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 is found to have 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 insignificant negative of the banks. This is similar with the finding of Otieno, and

Nyagol (2016); Biswas, Nath, Biswas and Rashid (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 insignificant negative effect on ROE of banks. This is consistent with the finding of Shrestha (2017); Shrestha (2022) concluded that there is negative and significant effect of CRR on ROE of banks but it is not consistent with the prior study of Biswas et al. (2021); Ayim and Agyemang (2021) concluded that insignificant positive impact of cash reserve ratio on profitability of the banks. Likewise, credit to deposit ratio has significant 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, Kebede and Selveraj (2015); Al-Eitan and Bani-Khalid (2019); Poudel (2018); Dunyoh, Ankamah and Kosipa (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 significant negative effect on ROE of banks which is consistent with the finding of Shrestha (2017) but opposite to the finding of Munangi and Sibindi (2020). Finally, the effect of bank size (LogSize) on ROE is insignificant 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

The conclusions and summary findings are covered in this last chapter. From the data analysis above, the main conclusions and findings are also derived. Finally, conclusions and important discoveries have led to the provision of implications.

5.1 Summary

Credit risk is essential to a company's 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 general objective of the study is to examine the impact of credit risk on profitability of banks in Nepal. The other specific objectives are to analyze the position of credit risk and profitability position of commercial banks in Nepal, to investigate the relationship between credit risk and profitability of commercial banks in Nepal and to examine the impact of credit risk factors 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 on profitability of commercial banks in the

study. There are 20 commercial banks operating in Nepal. They constitute the population. Among of them, SBI, NABIL, NMB and GIBL are selected for the study of credit risk as sample on the basis of purposive sampling method because these banks are top three 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 (2012/13-2021/22). 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 SBI performing best or maintaining their NPLs perfectly among them which shows SBI has lowest credit risk among them. Profitability position in terms of ROA, NABIL could manage their overall operations due to highest ratio among them. However, NABIL the best or most effective management in earning profit among them. Moreover, it can be said that NABIL is generating more income and making progressive performance among them due to the highest ROE. The correlation analysis reveals that cash reserve ratio (CRR) has insignificant negative relation with ROA and insignificant positive relation with ROE. Likewise, there is insignificant positive correlation between credit to deposit ratio (CDR) and ROA and significant positive relationship with 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 insignificant negative relationship with ROA and significant negative relationship with ROE of the banks. The multiple regression analysis shows that cash reserve ratio has insignificant negative effect on profitability (ROA and ROE) of the banks. However, credit to deposit ratio has significant positive impact on profitability. At the same time, non-performing loan ratio and bank size have insignificant negative impact on profitability of the sample banks. Finally, leverage has significant negative impact on profitability (ROA and ROE) of the banks.

5.2 Conclusion

The findings of the research concluded that NMB has a strong liquidity position and that its regular business activities go without a hitch. As the bank that is most successful in utilizing its entire deposit base for loans and advances while turning a sizable profit, NMB has the greatest credit to deposit ratio. Because SBI is keeping its non-performing loans (NPLs) faultless and is doing the best out of all of them, it has the lowest credit risk of all of them. SBI currently indicates that a substantial portion of funding comes from creditors as opposed to owners. With the greatest ratio among them, NABIL's profitability position in terms of ROA allowed them to manage their whole activities. Put another way, by making the best use of its assets, NABIL is able to maximize its return on investment. Nevertheless, NABIL has the best or most efficient management when it comes to making money. Furthermore, because NABIL has the greatest ROE among them, it can be claimed that they are producing more money and performing better than the others.

The correlation analysis concluded that cash reserve ratio (CRR) has insignificant negative relation with ROA and insignificant positive relation with ROE. Likewise, there is insignificant positive correlation between credit to deposit ratio (CDR) and ROA and significant positive relationship with 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 insignificant negative relationship with ROA and significant negative relationship with ROE of the banks.

The multiple regression analysis concluded that cash reserve ratio has insignificant negative effect on profitability (ROA and ROE) of the banks. However, credit to deposit ratio has significant positive impact on profitability. At the same time, non-performing loan ratio and bank size have insignificant negative impact on profitability of the sample banks. Finally, leverage has significant negative impact on profitability (ROA and ROE) of the banks.

5.3 Implications

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

- This study found that credit to deposit ratio and leverage ratio have significant impact on profitability whereas non-performing loan, cash reserve ratio and bank size have insignificant impact on profitability 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.