CREDIT RISK MANAGEMENT AND 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

By

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CERTIFICATION OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled "Credit Risk Management and Profitability of Nepalese Commercial Banks". The work of this dissertation has not been submitted previously for the purpose of conferral of any degrees nor has it 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.

Urmila Dhital

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July, 2024

REPORT OF RESEARCH COMMITTEE

Ms. Urmila Dhital has defended research proposal entitled "Credit Risk Management and 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 Jhabindra Pokharel and submit the thesis for evaluation and viva voce examination.

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APPROVAL SHEET

We have examined the dissertation entitled Credit Risk Management and Profitability of Nepalese Commercial Banks presented by Ms. Urmila Dhital for the degree of **Master of Business Studies (MBS).** We hereby certify that the dissertation is acceptable for the award of degree.

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Urmila Dhital

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ABBREVIATIONS

A.D.	=	Anno Domini
ADBL	=	Agricultural Development Bank Limited
ANOVA	=	Analysis of Variance
ASE	=	Amman Stock Exchange
BR	=	Base Rate
CAR	=	Capital Adequacy Ratio
CDR	=	Credit Deposit Ratio
CRR	=	Cash Reserve Ratio
DMD	=	Deposit Money Banks
EBL	=	Everest Bank Limited
Et Al.	=	Et Alia
FY	=	Fiscal Year
GIBL	=	Global IME Bank Limited
IME	=	International Money Exchange
KBL	=	Kumari Bank Limited
Ltd.	=	Limited
MENA	=	Middle East and North Africa
NABIL	=	Nabil Bank Limited
NEPSE	=	Nepal Stock Exchange
NPL	=	Non-Performing Loan
NRB	=	Nepal Rastra Bank
OLS	=	Ordinary Least Squares
PCBL	=	Prime Commercial Bank Limited
PSTR	=	Panel Smooth Transition Regression
ROA	=	Return on Assets
ROE	=	Return on Equity
SANIMA	=	Sanima Bank Limited
SBL	=	Siddhartha Bank Limited
SCBNL	=	Standard Chartered Bank Nepal Limited
SEM	=	Structural Equation Modeling
SET	=	Stock Exchange of Thailand

ABSTRACTS

Commercial bank has been playing a great role for the economic development of country directly or indirectly. Therefore, the study has examined the credit risk management and profitability of Nepalese commercial banks. The study is based on secondary data and data collected from annual reports of selected commercial banks and bank supervision report of Nepal Rastra Bank. The study has employed descriptive and casual comparative research design. For the study purpose nine commercial banks selected from the period of 2013/14 to 2021/22. For the study purpose ROA and ROE are considered as dependent variables and NPL, CDR, CRR, CAR and BR considered as independent variables. The results revealed that CDR and CAR have positive and significant impact on ROA of commercial banks in Nepal. However, NPLR, CRR and BR negative and insignificant impact on ROA. Similarly, CDR and CAR positive and significant impact on ROE whereas NPLR, CRR and BR have negative and insignificant impact on ROE of Nepalese commercial banks.

Keywords: *Credit risk, profitability, commercial banks, base rate.*

CHAPTER I
INTRODUCTION

1.1 Background of the Study

There is always some risk involved in banking activities; this cannot be avoided. To put it simply, risk is the unknown nature of upcoming circumstances or events. This implies that banks are unaware of the results of their company investments. Banking risks come in a variety of forms, including as operational, market, liquidity, cybersecurity, compliance, and strategic risks. For commercial banks, credit risk is the most important of these. Credit risk is a fundamental concern in the banking sector, playing a pivotal role in determining the stability and profitability of financial institutions. It refers to the possibility that borrowers may fail to meet their obligations, resulting in financial losses for the bank. Effective management of credit risk is crucial because it directly impacts a bank's asset quality, earnings, and overall financial health (Dang & Nguyen, 2021). High levels of non-performing loans can erode a bank's capital base, restrict its lending capacity, and diminish investor and depositor confidence. Conversely, robust credit risk management practices, such as thorough credit assessments, ongoing monitoring, and proactive loan recovery efforts, can significantly enhance a bank's resilience to economic fluctuations and market volatility. Furthermore, maintaining an adequate capital adequacy ratio ensures that banks have sufficient buffers to absorb potential losses, thereby supporting long-term stability and growth. In essence, the ability to effectively manage credit risk not only safeguards the bank’s financial performance but also contributes to the broader economic stability and growth of the financial system (Nguyen, 2024).

Credit risk management in commercial banks has become increasingly important not only because of the global financial crisis that was experiencing but also as a critical concept that regulates a bank's survival, growth, and profitability. The risks most applicable to banks, risk of credit, risk of interest rate, risk of market, risk of liquidity, risk of solvency, and risk of foreign exchange, are always considered in risk management (Zou & Li, 2014). Financial institutions need to manage their credit risk

effectively in order to continue existing and expanding. Current scholarly research emphasizes how important it is for banks to have a robust credit risk policy. Inadequate credit administration and poor credit management are frequently the primary issues facing the banking industry. Numerous scholars have examined the relationship between credit risk and commercial banks' profitability from a variety of perspectives (Catherine 2020).

Liquidity was an instrumental factor during the recent financial crisis. As uncertainty led funding sources to evaporate, many banks quickly found themselves short on cash to cover their obligations as they came due. In extreme cases, banks in some countries failed or were forced into mergers. As a result, in the interest of broader financial stability, substantial amounts of liquidity were provided by authorities in many countries, including Canada and the United States (Longworth 2010; Bernanke 2008). Internal flaws in any financial institution, such as ineffective management, can lead to credit risk in banks. Poor management affects liquidity, which increases the number of non-performing loans (Mwaurah, 2013). Credit risk is one of significant risks of banks by the nature of their activities. Through effective management of credit risk exposure banks not only support the viability and profitability of their own business but also contribute to systemic stability and to an efficient allocation of capital in the economy (Psillaki et al. 2010).

Problems with risk management in the banking industry have a big impact not only on bank performance but also on the growth of the national economy and general company development. The risk is inherent in all aspect of banking business operations. Credit business is a one of the major parts of the bank (Kattel, 2016). Credit risk is accessed through analyzing the financial performance of commercial banks in an attempt to mitigate impacts arising from credit defaults. The financial health of the commercial banks depends on the possession of good credit risk management dynamics. Commercial banks may have a keen awareness of the need to identify, measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred (Bhattarai 2016).

The impact of credit risk on the profitability of banks is not clear-cut; it may be positive or negative. On one hand, when banks take higher credit risk, they normally earn a higher profit. On the other hand, the profitability of banks may drop when bank management fails to collect the loans. The literature indicates that there is an inverse relationship between bank liquidity and profitability. Theoretically, when banks hold a greater amount of liquid assets, they lose the gains in term of opportunity cost. However, the banks holding a lesser amount of liquid assets normally earn a greater profit (Pracoyo & Imani, 2018). The likelihood that a borrower will fail to make timely principal and interest payments is known as the default rate. A bank is a commercial or state entity that provides financial services, including accepting deposits, issuing various types of currency, processing transactions, extending credit, and providing loans (Campbell, 2007). It is defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms (Basel, 2000). A bank is like any other business, but for banks, profitability is going to depend on risk management. Banks face different types of risk, but credit risk is the biggest one faced by banks and financial intermediaries (Poudel, 2012).

There had been a been a wave of mergers between big commercial banks in Nepal and after the recent and upcoming mergers, the number of commercial banks is twenty (Subedi & Timilsina, 2023). The core banking business is mobilizing the deposits and utilizing it for lending to industry. Lending business is generally encouraged because it has the effect of funds being transferred from the system to productive purposes, which results into economic growth. However, lending also carries credit risk, which arises from the failure of borrowers to fulfill its contractual obligation during the course of transaction. As such, careful consideration should be given to efficient credit management. There is a default risk associated with extended credit to borrowers. Banks give credit with the expectation that borrowers would pay it back, yet some default often. Because of the requirement to set aside funds for these loans, banks' revenue consequently declines. Commercial banks may have profits volatility and increased profit variability risk if they are unable to forecast the percentage of borrowers who would fail.

1.2 Problem Statement

Credit risk management plays an important role in banks as it is an integral part of the loan process. It maximizes bank risk, adjusted risk rate of return by maintaining credit risk exposure with view to shielding the bank from the adverse effects of credit risk. Many people's lives and almost every industry requiring financial investment depend heavily on credit. The principal constituents of bank credit, loans and advances, are predominantly furnished by private commercial banks. These banks further manage operations such as foreign currency exchange services, local and international transfers, and deposit mobilizations. As a result, good credit management has important effects on both the macro and local levels (Abayomi et al., 2018).

When a borrower fails to make planned payments for a predetermined length of time, the loan is considered non-performing. A loan loss provision is a cash reserve a bank creates to cover problem loans that are unlikely to see repayment. When a bank expects that a borrower will default on their loans, the loan loss provision can cover a portion of or the entire outstanding balance. An increase in credit risk by commercial banks can reduce financial profitability. However, when the credit risk is too high, banks are not efficient in using existing capital sources, thereby reducing profitability, which can cause financial instability. Credit risk negatively affects the volatility of expected returns in banks. Thus, managing credit risk for efficient management of a financial institution has gradually become the most crucial task. For commercial banks, extending loans is a major source of revenue. However, if it is not effectively and efficiently managed, it would have an adverse impact on the banks' returns. In terms of importance, it is the first of all risks; consequently, commercial banks may suffer large losses or even go bankrupt as a result of a few major clients defaulting (Bessie, 2002).

In the corporate world, liquidity and profitability are extremely important. The management of a company's current assets and current obligations is referred to as liquidity. It is crucial in determining if a business can handle its short-term responsibilities in an efficient manner. Because of its critical significance, businesses must keep a sufficient quantity of cash on hand to cover their immediate liabilities. A

balanced liquidity level is essential to a company's productivity and financial success. Thus, in order to guarantee maximum profitability, businesses must ascertain the ideal degree of liquidity. There should be a balance between low and high liquidity. Instead, it should remain at a reasonable level. Profitability, on the other hand, assesses a company's earnings in relation to its operational costs and expenses. Profitability ratios help gauge a company's level of profitability, offering a clear analysis of its position on the profitability spectrum. The ultimate goal for any business is to enhance profitability, and all strive to achieve maximum profitability. Additionally, maintaining an optimal level of liquidity is crucial, as there is a significant correlation between liquidity and profitability (Ali & Ali, 2016). Various parties are concerning about the financial activities of the firm for making better decisions. Following parties are highly concerning about the liquidity position and profitability level based on the following reasons. Shareholders are the owners of the listed companies. They invest their money on shares to make a higher return from the investment. Hence, they primarily concern about the liquidity position of the company, because liquidity level affects to determine the profitability level of company (Saleem & Rehman, 2011).

A bank's available capital as a percentage of its risk-weighted credit exposures is determined by the capital adequacy ratio. Often referred to as the capital-to-risk weighted assets ratio, it serves to protect depositors and improve the efficiency and stability of financial institutions throughout the world. An increase in the capital adequacy ratio by commercial banks can help increase financial stability. However, when the capital adequacy ratio is too high, banks are not efficient in using existing capital sources, thereby reducing profitability, which can cause financial instability. It indicates that higher the capital adequacy ratio, higher would be the return on assets and return on equity. Similarly, increase in cost per loan assets leads to an increase in return on assets and return on equity.

The profitability of banks' operations is largely dependent on the precise assessment and effective management of credit risk, which is by far the biggest risk they face (Gieseche, 2004). If a counterparty or borrower fails to meet their obligations, it can lead to financial losses and adversely affect the bank's financial performance.

1. What is the current credit risk management and profitability position of Nepalese commercial banks?
2. Is there any relationship between credit risk management and profitability of Nepalese commercial banks?
3. What is the impact of credit risk management on profitability of Nepalese commercial banks?

1.3 Objectives of the Study

This study's main goal is to investigate how credit risk management affects Nepal's commercial banks' bottom lines. In banks, the issue of credit risk is greater concern because of the higher levels of risk resulting from some of the characteristics of clients and business conditions that they find themselves in. Banks must make more investments in managing default rates and work to maintain an appropriate level of capital adequacy in order to reduce loan risk and achieve optimal performance (Anh, 2024). While different approaches tackle inefficiencies and instability, the study focuses on how banks' credit risk impacts their bottom line. In order to achieve the basic purpose or objective, the following other objectives have been set:

1. To analyze the current credit risk management and profitability position of Nepalese commercial banks.
2. To investigate the relationship between credit risk management and profitability of Nepalese commercial banks.
3. To examine the impact of credit risk management on profitability of Nepalese commercial banks.

1.4 Rationale of the Study

Providing loan is a major income source for commercial banks, but it also introduces credit risk. This study emphasizes on credit risk management and performance of Nepalese commercial bank. Various variables impact the success of commercial banks in the modern world. The nation's financial system's health is crucial as its collapse might impede the nation's economic progress (Das & Ghosh, 2007). The study on credit risk management and bank performance of commercial banks in Nepal

is significant for several reasons. The primary assets of commercial banks, their loan portfolios, generate a significant amount of interest revenue, contributing to their overall earnings. This highlights that loans play a crucial role in assessing the institution's financial success. Consequently, a bank's financial performance is closely linked to the health of its loan portfolio.

The results of this study could assist the sampled banks and other financial institutions in implementing practical solutions to manage the growth of non-performing loan portfolios by enhancing credit risk management procedures. This improvement is expected to boost their financial performance and support long-term sustainability. Overall, the study aims to enhance current credit risk management practices in commercial banks and serve as a guide for academics, professionals, experts, and the general public.

The study's findings will deepen our understanding of the topic and contribute to the existing body of literature. Researchers, students, legislators, bankers, economists, and other stakeholders interested in the relationship between credit risk management and bank performance will find it valuable as a reference. It aids in estimating and calculating transaction risks, helps prepare countermeasures for potential negative outcomes, and supports the development of credit models, which are essential for assessing loan risk.

1.5 Limitations of the Study

There are always limits to studies. Many studies have limitations in scope, which can confine their findings to specific groups or situations. The research has analyzed the credit risk management and its effect on profitability of commercial banks in Nepal over nine different fiscal years. Even though attempts have been made to accurately and clearly present and analyze the facts within limitations, errors may still occur from factors such as unreliable tools, inexperience in research, time constraints, lack of available data, and more.

The study has the following drawbacks;

1. The study is based on available secondary data. Therefore, the consistency of findings based on reliability and validity of secondary data.
2. The select only nine commercial banks namely, Nabil Bank Limited, Standard Chartered Bank Limited, Kumari Bank Limited, Sanima Bank Limited, Prime Commercial Bank Limited, Siddhartha Bank Limited, Everest Bank Limited, Global IME Bank Limited and Agricultural Development Bank Limited
3. Only selected financial and statistical tools are used.
4. The research has limited timeframe. The required data has been carried out from the annual reports of the sampled banks for the period of fiscal year 2013/2014 to 2021/2022.
5. The study based on published journals, articles, past researches and internet. These sources have their own limitations and drawbacks.

CHAPTER II
LITERATURE REVIEW

A variety of sources, including publications such as launched and unregistered economic journals, circulars, magazines, newspapers, and the annual reported balance accounts of important banks, are examined and critiqued in the literature review chapter, search for previous theses on related topics and explore websites relevant to the subject. This chapter has been divided into the following parts;

i. Theoretical Review
ii. Empirical Review

2.1 Theoretical Review

Although different banks may employ various specific methods, examining the general principles of credit risk management in this section can provide a clearer understanding of how banks handle credit risk. The theoretical literature review help establish what theories already exist, the relationships between them, to what degree the existing theories have been investigated, and to develop new hypotheses to be tested. A theoretical framework is a foundational review of existing theories that serves as a roadmap for developing the arguments you will use in your own work. Theories are developed by researchers to explain phenomena, draw connections, and make predictions.

2.1.1 Commercial Loan Theory

This theory postulates that by making short-term commercial transactions that will mature in a timely manner will keep banks in a ready state to meet the demands of their depositors. Also, the short-term commercial loans were desirable because they would be repaid with income resulting from the commercial transaction financed by the loan. This theory was developed by Harold G, Moulton in 1915. The real bills concept, also known as the commercial loan theory, is the earliest banking theory. According to this theory, banks should only issue short-term, self-liquidating loans on

commercial paper. Hosna and Manzura (2009) assert that the commercial loan theory aims to encourage lending to banks and participation in economic activities. When strictly applied, it becomes evident that the theory's purpose is to provide funds for changes in overall economic activity. This ideology is clearly favored by Deposit-Money Banks (DMBs) in Nigeria. Nigerian bankers believe that since their resources are quickly repayable, depositors' funds should be utilized for short-term loans.

Kargi (2011) explained the strong adherence to this idea is quite conventional, considering that during the time the theory was dominant, there were few or no secondary reserve assets available to provide banks with a liquidity buffer. Moreover, this hypothesis overlooks the credit needs of Nigeria's emerging economy. It has not led to increased bank financing for the acquisition of real estate, machinery, plants, and homes. The theory also neglects the relative stability of bank deposits by insisting that all loans should be repaid in the normal course of business. While demand deposits are available on request, it is unlikely that all depositors would request withdrawals simultaneously. As a result, a bank may 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.

2.1.2 The Anticipated Income Theory

The Anticipated Income theory holds that liquidity can be guaranteed whenever secured advance instalments are made on future salary of the borrower. This hypothesis relates advance reimbursement to pay than depend on guarantee. This theory additionally holds that a banks liability can be impacted by the development example of advances and speculation portfolios. The hypothesis perceived that specific sorts of credits have more liquidity than others. Based on this theory, bank executives received stepping stool impact in the venture portfolio. Banks guaranteed a

specific measure of protections developing every year and on occasion when assets may be requested for loaning or withdrawal. Anyway, there was no sign about the future pay of the borrower. The huge currency markets began the training which later spread all through U.S. The underlying foundations of the theory can be followed to the restoration of federal fund markets in the 1980's and improvement of negotiable time deposits as a significant currency advertise instrument. Banks in U.S depend for liquidity on government finances advertise, Euro dollar market or offer of advance participation certificates. Such obtaining came to be called to be known as liquidity management. This theory was proposed by H.V. Prochanow in 1944 based on the act of expanding term credits by the US commercial banks. This theory expresses that independent of the nature and highlight of a borrower's the same old thing, the bank designs the liquidation of the term-credit from the expected normal income of the borrower. A term-credit is for a period exceeding one year and reaching out to a period of less than five years.

Prochnow (1949) developed a novel lending theory that was dubbed as the anticipated income theory after conducting an extensive investigation. Afriyie and Akotey (2011) report that their research revealed that the bank always intended to liquidate term loans from the borrower's projected revenues, irrespective of the type and size of the borrower's company. Instead of selling the borrower's assets as in the commercial or conventional theory of liquidity or transferring the loan to another lender as in the shift ability theory of liquidity, liquidity is achieved by projecting the borrower's income. This notion essentially states that banks should lend money based on the borrower's expected income rather than his current value. Kolapo, Ayeni and Oke (2012) stated that this theory's "future-oriented approach" to bank loans and advances is one of its most notable features. The "cash flow approach" to lending is another common name for it. When interpreted correctly, this idea was not a competitor of the shift ability hypothesis but rather of the commercial loan theory. The shift ability position, which holds that a bank's secondary reserves are its primary source of liquidity, is not contested. In contrast to the proponents of the commercial loan theory, it once more concentrated on the kinds of loans that banks should consider making, but it arrived at a quite different result (Moti et al, 2012).

2.1.3 The credit risk theory

Salas and Saurina (2002) defined credit risk as the possibility that a borrower may default on a loan by failing to make the required payments. The primary risk falls on the lender, involving the loss of principal and interest. This loss can be total or partial and can result from various factors, such as an insolvent bank being unable to reimburse a depositor. To mitigate this risk, lenders may perform credit checks on potential borrowers, require them to obtain necessary insurance like mortgage insurance, or seek third-party security or guarantees. Generally, the higher the level of risk, the higher the interest rate debtors will be required to pay on the debt (Owojori et al., 2011).

2.1.4 The Liability Management Theory

According to this hypothesis, if a bank faces a reserve shortage, it can borrow or acquire reserve money through short-term loan instruments in the money market, thus eliminating the need for traditional standards. Shafiq and Nasr (2010) argue that this does not mean the bank manages its assets passively and only its liabilities. Instead, the hypothesis suggests that the bank's asset structure is crucial for providing liquidity. However, the theory views liquidity from a single perspective, asserting that a bank can use its liabilities to generate liquidity. A bank needs liquidity to process deposits, disburse loans to clients, and meet reasonable lending demands. Bank loans are not only profitable, but a bank that refuses to lend to its depositors in times of need is not likely to keep those depositors around for very long.

2.2 Empirical Review

Aluonzi et al. (2024) examines the effect of credit risk management on the profitability of the Centenary Bank Kabale Branch. Credit risk management was operationalized as credit risk identification, risk assessment, and risk control, while profitability was operationalized as return on equity, return on assets, and non-performing loans. The study population comprised of 140 respondents. A sample size of 103 respondents was obtained for sample determination. This study adopted a

mixed method approach. Quantitative data were collected using self-administered questionnaires and analyzed using Pearson's linear correlation coefficient. Qualitative data were collected through in-depth interviews and analyzed using content analysis. The study concluded that the risk identification, risk assessment and risk controls have a significant positive relationship with profitability at the central bank.

Harb et al. (2023) investigated how the accounting and market performance of banks operating in the Middle East and North Africa (MENA) area were affected by credit risk management and liquidity risk. Using regression analysis with panel data, the research examined a sample of 51 listed commercial banks across 10 MENA countries from 2010 to 2018. The findings revealed that credit risk management had a non-linear, convex relationship with market performance, but did not impact the banks' accounting performance. Interestingly, liquidity risk management did not significantly influence either performance metric among the institutions studied. However, an inverted U-shaped relationship indicated that when banks combined credit risk management with liquidity risk management efforts, liquidity risk management activities had a substantial impact on both accounting and market performance. This study also looks at how these hazards together affect bank performance.

Thammakitsopon et al. (2022) aimed to analyze the relationship and effects of credit risk management, capital adequacy ratio, bank market share, and profitability of the commercial banks of Thailand from 2010 to 2020. Out of 144 banks listed on the Stock Exchange of Thailand (SET), eleven banks were used as a sample. The data were analyzed using the SEM model. In the path analysis, the maximum likelihood was used to estimate the path coefficient. The results found that the capital adequacy ratio has, first, an effect on market share, net interest rate differential, return on assets, and return on equity of commercial banks of Thailand. Secondly, cost per loan asset affects the return on assets of commercial banks listed in SET while cost per loan asset has no effect on bank market share and return on equity of commercial banks listed in SET. Thirdly, the cash reserve rate affects bank market share, return on equity, and return on assets, while the cash reserve rate does not affect the net interest rate differential of commercial banks of Thailand. Fourthly, the bad debt reserves to

non-performing debt ratio have an effect on bank market share, return on equity, and return on assets of commercial banks of Thailand. In addition, the capital to asset ratio has an effect on bank market share, return on equity, and return on assets, while the capital to asset ratio does not affect the net interest rate of commercial banks of Thailand. Lastly, the capital to asset ratio, capital to loan asset, cash reserve rate, bad debt reserves to non-performing debt ratio, and capital to asset ratio have an indirect effect on the net interest rate, return on equity, and return on assets of commercial banks of Thailand.

Banu et al. (2021) investigated the impact of credit risk management metrics on the profitability characteristics of state-run commercial banks operating in Bangladesh. In order to meet the study's goals, the researcher examined the audited yearly reports of four sample banks for the years 2012 through 2016. In order to get at the concluding comment in accordance with the study goals, the ANOVA approach, multiple regression model, and correlation matrix were utilized. The results showed that while there is minimal variation in the various profitability features across the sample banks over the research period, there is considerable and insignificant variance as well as connection in the various indicators of credit risk management. Additionally, throughout the study, various credit risk management indicators - including loans and advances, classified and unclassified loans, leverage ratio, bad debt, default ratio, cost per loan asset, and cost-to-income ratio - had no discernible effect on the sample banks' net profit percentage or other profitability metrics, such as return on equity and return on assets.

Kidane (2020) assessed how Ethiopian commercial banks' profitability was affected by credit risk management. For ten-year intervals (2010-2019), secondary data was collected from the National Bank of Ethiopia. Correlation analysis and the fixed effect model were used in the investigation. Commercial bank profitability was assessed using return on asset, while macroeconomic variables such as GDP and inflation served as indications of credit risk management. Bank-specific parameters included capital adequacy, loans and advances to total deposit, non-performing loans, bank size, and liquidity. The results demonstrated that the profitability of commercial banks in Ethiopia is significantly impacted by credit risk management in terms of both

macroeconomic and bank-specific factors. Additionally, the outcome showed that the quantity of non-performing loans during the research had no impact on the profitability of commercial banks. The study suggested that in order to reduce their detrimental effects on the profitability of commercial banks in Ethiopia, banks' credit risk management should pay equal attention to both internal and external factors, specifically GDP and inflation.

Bhattarai (2019) has investigated on how Nepalese commercial banks' performance is affected by credit risk. The study has chosen to use both causal comparative and descriptive research approaches. Regression analysis has been performed on 14 commercial banks' pooled data sets from 2010 to 2015. According to the regression results, the non-performing loan ratio has a negative impact on a bank's performance, whereas the cost per loan asset has a favorable impact. Bank size has a favorable impact on bank performance in addition to credit risk indicators. It is not believed that the cash reserve and capital adequacy ratio have an impact on a bank's performance. According to the study's findings, bank performance and credit risk indicators are significantly correlated.

Hamdi and Hakimi (2019) the aim of study to define the optimal level of liquidity and to investigate its impact on the overall bank profitability. To achieve these goals, we use a large sample of 127 countries over the period 2005-2015. The study used panel smooth transition regression (PSTR) as econometric approach and variables are liquidity, bank profitability. Findings also indicate that credit risk decreases significantly the level of profitability.

Samo and Murad (2019) determined the effects of liquidity and financial leverage on profitability using a sample of forty carefully chosen publicly traded textile firms from Pakistan's economy. With the use of a quantitative approach, yearly data from Pakistan's textile industries from 2006 to 2016 is utilized to create models for pooled panel regression and descriptive statistics. The businesses' financial filings have provided secondary data. The findings showed that financial leverage and profitability have a negative association, but liquidity and profitability have a favorable link. The liquidity indicator (CR) had positive and significant influence on ROA, whereas the

financial leverage measure (D/E ratio) indicated a negative but less pronounced impact on ROA. The other part of result concluded that there is a positive strong impact of CR on ROE too and D/E has a negative impact on ROE. This study improves on some of the existing studies, in that it investigates the sub-total and overall effect of credit risk management and its indicators on financial performance of Jordanian commercial banks using certain individual indicators of credit risk management.

Tuladhar (2017) investigated how the profitability of a commercial bank in Nepal was affected by credit risk management. Panel data analysis and pooled regression analysis have been used to gather and examine data from twenty-eight commercial banks for the years 2011 to 2015. Return on equity (ROE) and return on assets (ROA) are used as indicators of profitability in this study, while the number of female board members (FBM) and the non-performing loan ratio (NPLR), cash reserve ratio (CRR), coverage ratio (CR), asset quality ratio (AQR), bank size (BS), capital adequacy ratio (CAR), liquidity ratio (LR), and leverage ratio (LER) are used as independent variables as indicators of credit risk management. The results indicated that the bank's performance is positively influenced by the coverage ratio, capital adequacy ratio, and bank size. Conversely, the performance is negatively affected by the leverage ratio, non-performing loan ratio, and the presence of female board members. Additionally, the cash reserve ratio, asset quality ratio, and liquidity ratio were found to be insignificant in predicting the bank's performance. The study recommends that for improving financial performance, commercial banks in Nepal should adopt an efficient credit risk management strategy that optimizes the levels of these factors.

Dhungana and Pradhan (2017) examined the impact of lending by commercial banks on Nepal's inflation rate. The study used panel data from 24 commercial banks between 1996 and 2015 to perform regression and correlation analysis. The empirical findings demonstrate that bank lending has a favorable impact on Nepal's inflation rate. According to the report, a central bank that is serious about containing inflation should reduce its excessive lending to the speculative and unproductive sectors of the economy. The study's main finding is that bank lending has a beneficial effect on

Nepal's inflation rate. Nonetheless, interest rates have a detrimental effect on inflation. Consequently, it is advised that a central bank that is serious about containing inflation reduce its excessive lending to the speculative and unproductive sectors of the economy.

Sapkota (2017) examined the joint venture commercial bank of Nepal's research on credit risk management. Six joint venture commercial banks have been chosen by the author as a sample. The research has been conducted using data spanning from 2008 to 2015. The study solely employed a quantitative methodology, concentrated on describing the results from SPSS, and conducted empirical analysis using a regression model. The credit and advance to total deposit ratio, credit and advance to fixed deposit ratio, credit and advance to total assets ratio, performing assets to total assets ratio, loan and loss provision, and return analysis are the dependent and independent variables that the author employed. Banks have a major impact on joint venture commercial banks' credit risk management, according to the study's findings. The author came to the conclusion that the primary element influencing the joint venture commercial bank 23 of Nepal's credit risk management's financial performance is the adequacy of capital for that particular factor. The combined credit ratio of commercial banks is trending upward. The non-performing assets of commercial banks have been rising steadily, as seen by the increase in the ratio of credit and the corresponding increase in non-performing assets.

Waleed (2016) conducted the study between 2010 and 2015, included all banks listed on the Pakistan Stock Exchange. The primary research strategy involved document investigation to collect secondary data. The Ordinary Least Squares (OLS) method was used to analyze and evaluate six research models. The findings revealed a strong correlation between bank liquidity ratios and net profit margin, return on equity, and return on assets. However, the correlation between liquidity and earnings per share and return on investment was found to be negligible.

Iftikhar (2016) examined the effect of credit risk management on Pakistan's commercial bank's financial results. The 10 banks were chosen to represent Pakistan's entire banking industry. The capital adequacy ratio and non-performing loans as

indicators of credit risk management were the independent variables employed by 21 authors, whereas the profitability indicators that were reliant on them were return on equity and return on assets. Panel regression analysis has been used to examine the data. The outcome demonstrated that the commercial bank of Pakistan's financial performance is significantly impacted by the factor of credit risk management. The study concluded that in order for banks to increase their earnings, they needed to improve their credit risk management. Before making a loan to a customer, Pakistani banks must implement sound credit estimation. They also need to set up an efficient and effective credit risk management system and stringent credit provisioning procedures, including thorough customer monitoring and full disclosure of the loan's purpose and repayment capacity. Banks should design and implement methods that will boost their competitiveness and overall performance, in addition to restricting their exposure to credit risk management.

Opoku (2016) evaluated the relationship between credit risk and the profitability of a chosen Ghanaian bank. Data from seven chosen banks covering the nine-year period (2005-2013) were used by the author. In order to quantify credit risk, the author employed independent factors such as the percentage of nonperforming loans to total loans, the loan loss provision ratio, and the loan advance ratio; dependent variables included profitability measures such as return on equity and return on assets. Furthermore, the model included a few internal and external profitability drivers. The findings indicated that the bank's profitability is favorably correlated with the loan loss provision ratio and the loan-to-advance ratio, but adversely correlated with non-performing loans. Researchers have also demonstrated that while bank size has an inverse relationship with profitability, capital adequacy and age have a positive relationship. This was statistically significant for all external variables. The report argued that to enhance the bank's profitability, management must take decisive action to improve credit risk management.

Ahmad (2016) examined the trade-off between profitability and liquidity in the banking industry was the research's main goal. The study was conducted between 2010 and 2015 and was applied to all banks that were listed on the Pakistan Stock Exchange. The primary research strategy used to collect secondary data for the study

was document investigation. The Ordinary Least Squares (OLS) approach was used to declare and value six research models. The results showed a strong correlation between bank liquidity ratios and net profit margin, return on equity, and return on assets. The link between liquidity and return on investment and earnings per share is negligible, nevertheless. These results are mostly reasonable given new regulations defining an optimal bank liquidity level are being planned by policymakers. This will expand the profits of shareholders but will correspondingly improve the usage of the assets of the bank.

Vintila and Nenu (2016) this study started from the assumption that liquidity and profitability are issues of significant impact on companies' stability and development. Data were collected for a period of 10 years, from 2005 to 2014. The empirical study was conducted by econometric analysis, using multivariate regression models for unbalanced panel data. Financial performance was approached through accounting measures using return on assets and return on equity. Factors that could influence firm's performance were focused on liquidity and solvency indicators. The results confirmed the statistically significant relationship between the analyzed variables and revealed a negative correlation between liquidity and corporate financial performance.

Wolday (2015) investigated the effect of credit risk management on a chosen Ethiopian commercial bank's performance. 35 observations were utilized for the research, and the author used balance panel data from 2009 to 2013 to pick seven commercial banks as a sample. The study focused on describing the results from SPSS and solely employed a quantitative method, using regression modeling to do empirical analysis. The author employed the following independent factors to control credit risk: loan loss provision, liquidity, operating inefficiencies, loan growth, and capital adequacy ratio; the dependent variable was return on equity, which served as a profitability indicator. The research findings demonstrated a statistically significant positive association between loan loss provisions, operating inefficiencies, and loan growth with bank profitability. Conversely, there was a statistically significant negative relationship between liquidity and capital adequacy with return on equity. According to the author, commercial banks must prioritize the credit risk variables that are subject to legal scrutiny.

Ahmed (2015) the objective of this study is to investigate the impact of liquidity and profitability on the dividend policy in the UAE banking sector, and to examine any kind of variations between Islamic and conventional banks prior and subsequent to the financial crisis. The study analyzes the data of 18 out of the 24 UAE national banks over the period 2005-2012. The dividend payout ratio is analyzed in relation to six liquidity and profitability ratios. The correlation analysis and regression analysis are conducted to analyze the data. The main finding is that the dividend payout ratio has a significant and positive correlation with liquidity but negative and insignificant correlation with profitability. There is a significant variation of the variables in Islamic banks but not significant with the period.

Nimer, Warrad and Omari (2015) this study sought to find out whether liquidity through quick ratio has significant impact on Jordanian banks profitability through return on asset (ROA). The study used the 2005-2011 financial reports of 15 Jordanian banks listed at Amman Stock Exchange (ASE). The study revealed that there is significant impact of independent variable quick ratio on dependent variable return on asset (ROA). That means profitability through return on assets (ROA) in Jordanian banks is significantly influenced by liquidity through quick ratio.

Ugoani (2015) analyzed the connection between inadequate credit risk management and Nigerian bank failures via survey study design. Chi-square data showed that the most varied and complicated activity in the banking industry is the credit risk management function, and that poor corporate governance speeds up bank failures. The author's conclusion is that inadequate credit risk management contributes to bank failures.

Kodithuwakku (2015) utilized both primary and secondary data to examine how credit risk management affects the performance of commercial banks in Sri Lanka. Indicators of credit risk included loan provision to total loan (LP/TL), loan provision to non-performing loans (LP/NPL), loan provision to total assets (LP/TA), and non-performing loans to total loans (NPL/TL). Return on assets (ROA) was used as a performance measure. The results show that non-performing loans and contingencies negatively impact business profitability.

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

Bhattrai (2014) assessed how credit risk affected the Nepalese commercial bank's performance. The fourteen commercial banks, comprising 77 observations, have been chosen as a sample utilizing poled data for the years 2010 to 2015. The dependent variable is return on assets, and the author has added the following indicators of independent variables: capital adequacy ratio, non-performing loan ratio, cost per loan asset, cash reserve ratio, and bank size. The data have been evaluated using regression analysis. According to the study's findings, the commercial banks that were examined have been handling credit risk improperly. The non-performing loan percentage has a negative impact on bank performance, but cost per loan asset has a favorable impact on bank performance, according to the author's conclusion. Unlike other research, there is no correlation between bank performance and the cash reserve and capital adequacy ratio. Considering that credit risk and bank performance are closely related. The author suggested that before making loan offers to consumers, banks set up appropriate credit risk management plans by carrying out reliable credit evaluation processes.

Adeusi (2014) determined how credit risk management and a Nigerian bank's financial performance are related. Using the panel data estimation approach, the author has employed secondary data from 10 Nigerian banks' annual reports and financial statements for the years 2006 to 2009. The study's data collection is cross-sectional and is observed across time. The cost of bad and doubtful loans, non-performing loans, liquidity, equity to total assets ratio, equity to loan ratio, and debt equity ratio were the independent factors, while return on equity and return on assets were the dependent variables. The study results indicated a positive and significant

association between the capital assets ratio and the financial performance of banks, while an inverse relationship was found between the cost of bad and doubtful loans and the bank's financial performance. The author concluded that there is a strong correlation between credit risk management and bank performance. To improve the bank's financial performance, the author suggested that the cost of bad debt and doubtful loans, the debt-equity ratio, and managed funds should be properly managed.

Kurawa and Garba (2014) have assessed the impact of default rate (DR), cost per loan asset (CLA), and capital adequacy ratio (CAR) on banks' profitability (ROA) by evaluating the impact of credit risk management (CRM) on the profitability of Nigerian banks. The examination was conducted using secondary data from the 2002–2011 annual reports and accounts of listed banks. Results from 47 random-effect generalized least square (GLS) regression techniques examining the impact of credit risk on the performance of Nepalese commercial banks show that the dependent variable, ROA, has a significant positive relationship with both the default rate (DR) ratio and the cost per loan asset (CLA) ratio. AGE and ROA have a negative correlation with each other, but LOAN and ROA have a favorable link. The profitability of Nigerian banks is significantly positively impacted by components of credit risk management, according to the authors' conclusion.

Abiola and Olausi (2014) investigated how credit risk management affects Nigerian commercial banks' operational results. A seven-year period of financial reports from seven commercial banking companies was analyzed (2005–2011). When estimating the model, the panel regression model was utilized. As credit risk management indicators in the model, non-performing loans (NPL) and the capital adequacy ratio (CAR) were utilized, while return on equity (ROE) and return on assets (ROA) served as performance indicators. he research findings indicate that the profitability of commercial banks in Nigeria is significantly impacted by credit risk management.

Ogboi and Unuafe (2013) with the use of panel data analysis assessed the credit risk management techniques and capital sufficiency of Nigerian banks' financial performance between 2004 and 2009. Return on assets was the dependent variable, while the author's indicators of independent variables comprised loan loss provision,

loan and advance, nonperforming loan, capital adequacy ratio, and liquidity. The panel regression model was utilized by the author for data analysis. With the exception of loans and advances, which were found to have a negative effect on bank profitability, the results demonstrated that prudent credit risk management and capital sufficiency favorably benefited banks' financial performance. The study concluded that, in light of the findings, Nigerian banks should develop suitable credit risk management plans and carry out thorough credit assessments prior to loan distribution and drawdown.

Bhunia (2013) analyzed the importance of liquidity management on profitability of the selected 100 small-medium private sector steel companies in India for the period from 1998 to 2012. Since LPG, to make sure rapid financial progress it was considered important that a sound steel production program with private sector on an alarming foundation must be formulated and the government's attitude was changed remarkably. Secondary data gathered from the CMIE Prowess database served as the study's foundation. In the course of analysis, descriptive statistics and regression analysis have been designed. The empirical results indicate that liquidity position is very sound and there exists a relationship between liquidity and profitability indicators.

Afriyie and Akotey (2012) investigated the effect of credit risk management on the profitability of Ghanaian community and rural banks from 2006 to 2010 using a panel regression model. The non-performing loan and capital adequacy ratio are the independent factors that the author has used to measure credit risk management, while the return on equity and return on assets are the dependent variables that the author has used to measure bank profitability. The research findings demonstrated a statistically significant positive correlation between non-performing loans and bank profitability, indicating that non-performing loans are rising in direct proportion to profitability. The author has discovered that the bank transfers the expense of loan default to other customers with larger loans, which is the cause of inefficient credit risk management.

Paudel (2012) investigated how credit risk management affects Nepalese commercial banks' financial performance during an eleven-year period (2001-2011) using the financial reports of thirty-one banks. Multiple regression analysis, correlation analysis, and descriptive data analysis were the approaches used in this study. Return on assets (ROA) served as the study's financial performance metric. The study included three variables to forecast the financial performance of banks: capital adequacy ratio, cost per loan asset, and default rate. All these characteristics, according to the author, have an adverse effect on the financial performance of banks. Cost per loan asset, on the other hand, is not a major predictor of bank performance; instead, default rate (NPLR), among risk management indicators, is the single most important factor impacting bank financial performance in Nepal. Since credit risk management and bank performance are significantly correlated, the author comes to the conclusion that credit risk management is essential to bank success.

Epure and Lafuente (2012) evaluated bank performance for the Costa Rican banking sector from 1998 to 2007 while risk is present. The findings demonstrated that regulatory changes are followed by improvements in performance, that risk accounts for bank variations, and that non-performing loans have a negative impact on efficiency and return on assets while having a favorable effect on the net interest margin due to the capital adequacy ratio. The effect of credit risk management on Kenyan commercial banks' financial performance has been examined by Fredrick (2012). The CAMEL model was employed in the study as a stand-in for credit risk management. The author discovered that the financial performance of commercial banks was significantly impacted by CAMEL (credit risk components).

Chen and Pan (2012) analyzed 34 Taiwanese commercial banks' credit risk efficiency between 2005 and 2008 using Data Envelopment Analysis (DEA) and financial ratios. The study focused on three credit risk parameters: credit risk cost efficiency (CR-CE), credit risk allocative efficiency (CR-AE), and credit risk technical efficiency (CR-TE). The results revealed that only one bank demonstrated all forms of efficiency during the evaluated periods. Overall, the DEA results indicated that the average efficiency levels for CR-TE, CR-AE, and CR-CE in 2008 were relatively low.

Al-Khouri (2011) investigated how the general banking environment and the unique risk characteristics of banks affected the performance of 43 commercial banks in six Gulf Cooperation Council (GCC) nations from 1998 to 2008. Using fixed effect regression analysis, the results indicated that when bank performance is measured by return on assets, the main determinants are credit risk, liquidity risk, and capital risk. However, when profitability is measured by return on equity, liquidity risk is the only risk factor that impacts profitability.

Aloy (2012) the study is initiated to find out the cause and effect relationship between liquidity and profitability. The study covered 31 listed manufacturing firms in Sri Lanka over a period of past 5 years from 2007 to 2011. Correlation analysis and descriptive statistics were used in the analysis and findings suggest that there is no significant relationship between liquidity and profitability among the listed manufacturing firms in Sri Lanka.

Gill and Mathur (2011) the purpose of this study is to examine the impact of board size, the CEO (Chief Executive Officer) duality, and corporate liquidity on the profitability of Canadian service firms. A sample of 75 Canadian service firms listed on Toronto Stock Exchange (TSX) for a period of 3 years (from 2008-2010) was selected. This study applied co-relational and non-experimental research design. The results indicate that larger board size (large number of directors) negatively impact on the profitability of Canadian service firms. The findings of this paper also show that the CEO duality and corporate liquidity positively impact the profitability of Canadian service firms. In addition, firm size and firm growth positively impact the profitability of Canadian service firms. The findings may be useful for the financial managers, investors, and financial management consultants.

Saleem and Rehman (2011) has investigated the relationship between liquidity and profitability so that every firm has to maintain this relationship while in conducting day to day operations. The findings indicate that the liquid ratio alone has a significant impact on return on assets (ROA) but not on return on equity (ROE) or return on investment (ROI). They also demonstrate that the three ratios - current, quick, and liquid have no significant effect on ROE but have a significant impact on

ROI. Liquidity and profitability are closely related because one increases the other decreases. The study used regression analysis.

Kithinji (2010) with the use of regression analysis examined the connection between credit risk management and commercial bank profitability in Kenya from 2004 to 2008. The return on total assets was the dependent variable, while the quantity of credit and non-performing loans were the indicators of independent variables, according to the author. The study's findings demonstrated that there is no connection between a bank's performance score of 22 and the volume of credit extended or the percentage of non-performing loans. This indicates that the volume of lending and nonperforming loans has little impact on banks' overall profitability. The author suggested commercial banks increase their profitability by concentrating on things other than the volume of credit extended and nonperforming loans.

Ben-Naceur and Omran (2008) determined the bank capitalization and credit risk have a positive and significant impact on banks' net interest margin, cost efficiency, and profitability, according to research done in an effort to examine the effects of bank regulations, concentration, financial, and institutional development on commercial banks' margin and profitability in Middle East and North Africa (MENA) countries from 1989 to 2005.

Felix and Claudine (2008) examined the connection between credit risk management and bank performance. Their findings suggest that the ratio of non-performing loans to total loans made by financial institutions is negatively connected to return on equity (ROE) and return on assets (ROA), two metrics that measure profitability and both of which indicate a reduction in profitability.

Ahmad and Ariff (2007) have compared the main factors influencing commercial banks' credit risk in developing nations to those in established ones. The authors discovered that while management quality is crucial in the case of loan-dominant banks in emerging economies, regulation is crucial for banking systems that provide a variety of products and services. One important indicator of possible credit risk is also

seen to be a rise in the loan loss provision. The authors went on to say that banks in developing economies face greater credit risk than those in industrialized nations.

Raheman and Nasr (2007) has investigated working capital management has its effect on liquidity as well on profitability of the firm. In this research, there is a sample of 94 Pakistani firms listed on Karachi Stock Exchange for a period of 6 years from 1999-2004, the effect of different variables of working capital management including the average collection period, inventory turnover in days, average payment period, cash conversion cycle and current ratio on the net operating profitability of Pakistani firms. Debt ratio, size of the firm (measured in terms of natural logarithm of sales) and financial assets to total assets ratio have been used as control variables. Pearson's correlation, and regression analysis (Pooled least square and general least square with cross section weight models) are used for analysis. The results show that there is a strong negative relationship between variables of the working capital management and profitability of the firm.

Mekasha (2001) evaluated the performance impact of credit risk management on Ethiopian commercial banks. The association between ROA and loan provision, non-performing loans, and total assets was investigated by the researcher using ten years' worth of panel data from the chosen commercial banks. According to the study, credit risk management and bank performance are significantly correlated.

2.3 Research Gap

As previously mentioned, low loan standards and inadequate portfolio risk management have caused problems for Nepalese commercial banks in recent years. Therefore, by including new data and extending time series, the current study seeks to close the gap in the literature on the topic. The findings of this study reveal a stronger correlation between credit risk and banking performance profitability.

CHAPTER III
RESEARCH METHODOLOGY

Research methodology provides answers to questions about data generation and analysis. By carefully examining the research methods section, the readers can critically assess a study's overall validity and reliability. This section outlines the steps taken to investigate the research problem and justifies the specific procedures or techniques used to gather, select, process, and analyze information to understand the issue.. The methods section may include both historical and current information, along with various research methods such as surveys, interviews, and published research. This section is composed of five distinct components. Section one provides a description of study plan and research design, section two deals with population, sample and sampling design, section three describes method nature and sources of data. Section four describes method of analysis and finally section five presents research framework and definition of variables.

3.1 Research Design

By research design we mean an overall framework or plan for activities to be undertaken during the courses of research study. To assess, compare, categorize, and explain the financial circumstances of Nepalese commercial banks, a descriptive research design has been used. An analysis of the performance of Nepalese commercial banks was conducted using a casual comparative research approach. In order to ascertain if bank performance, as determined by ROA and ROE, can be predicted using credit risk variable data, the causal comparative research design has also been used in this study.

3.2 Population and Sample

Population refers to the entire group that the researcher wishes to investigate. Since, the study is about the credit risk management and profitability of Nepalese commercial banks, the total number of commercial banks operating in Nepal is the

population of the study. As of mid-June 2024, Nepal Rastra Bank (NRB) listed 20 'A' class commercial banks, constituting the population of the study (Banking and Financial Statistics, 2024). Out of 20 commercial banks, 9 commercial banks are selected for the purpose of the study using purposive sampling method with 1 government-owned, 3 joint ventures and 5 private commercial banks so that the study covers different ownership categories prevalent in the banking industry. The study represents 45 percent of the population with different ownership categories of the commercial banks in Nepal.

Global IME Bank Limited and Nabil Bank Limited were the first two banks which floated the highest loans and advances to the customers in FY 2079/80 have been selected as the sample banks. Everest Bank Limited, the first bank to introduce ATM machine at the country's only international airport in Nepal as well as Sanima Bank Limited, the bank with the lowest non-performing assets have also been selected. Kumari Bank Limited, the bank who bagged the "Client Innovation Award 2019"; Prime Commercial Bank Limited, the bank who bagged "The Bizz Business Excellence Award 2023" and Siddhartha Bank Limited, the bank awarded by the "HRM Awards for Corporate Excellence 2022" have also been selected as the sample.

3.3 Nature and Sources of Data

Multiple sources of data and information have been sought during the research process. This study is based on secondary sources of data in order to meet its affirmed objectives and respond the research questions which are obtained from selected three commercial banks for the period of 2013/14 to 2021/22. The secondary sources of data for the study are obtained from annual report of the banks, internet, homepage and related link visit different authors published articles, journals, reports, pervious study, research paper regarding topic, library research study, directives of NRB, various research report and dissertation, various publications dealing in the subject matter of study and so on.

3.4 Research Framework and Definition of Variables

A research framework is a precise representation of the structure of a research project plan. Through this structure, you can determine the critical areas of the study. It also allows you to come up with relevant research questions and research objectives. Research framework of the study describes the systematic explanation of the relationship among the dependent and independent variables for the purpose of analyzing the financial performance of commercial banks. This section provides the research framework of study and describes about variables that have been used in study and the relationship between the variables. In this study, dependent variable is return on assets (ROA) and return on equity (ROE) of the selected commercial banks of Nepal. The independent variables are non-performing loan ratio (NPL), credit deposit ratio (CDR), cash reserve ratio (CRR), capital adequacy ratio (CAR), and base rate (BR). Thus, the following research framework model is framed in the following:

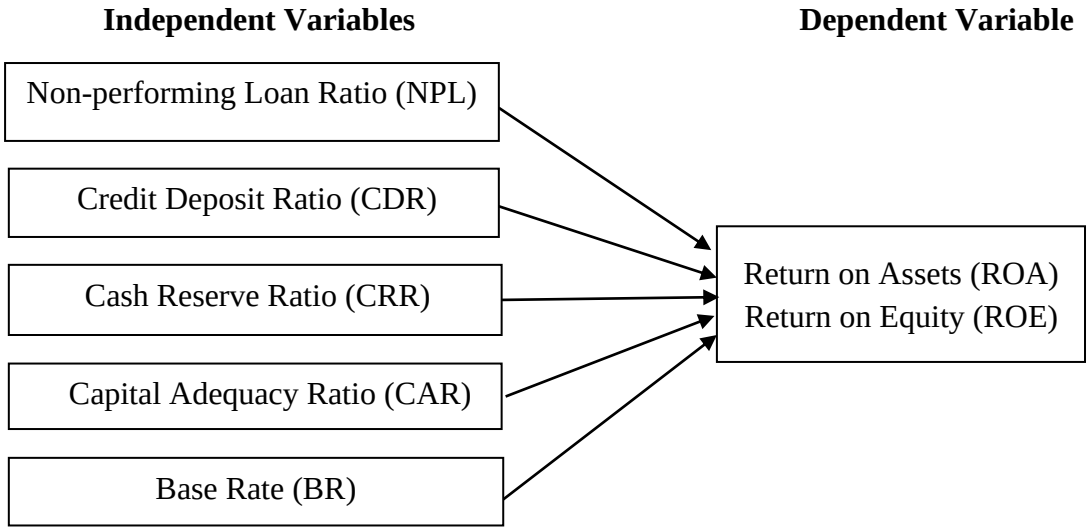

Figure 1. Research Framework. Source: Harb et al. (2023); Thammakitsopon et al. (2022); Kidane (2020); Tuladhar (2017); Iftikhar (2016)

3.4.1 Dependent Variables

The dependent variable is the variable being tested and measured in an experiment. The dependent variables dependent on the independent variable. In this study dependent variables are ROA and ROE.

Return on Assets

Return on assets (ROA) is a measure of a bank's asset use efficiency, by determining how profitable a company is relative to its total assets. ROA measures how willingly bank management takes risks to achieve a certain amount of profit per unit of total resources. An analyst, investor, or manager can determine how well a bank's management uses its assets to produce profits by looking at the ROA number.

Return on Equity

Return on equity (ROE) measures how the profitability of a bank in relation to shareholders equity. Return on equity (ROE) signifies how good the company is generating returns on the investment it received from its shareholders.

3.4.2 Independent Variables

A variable is called independent variable if its value is not influenced by any other variable under the study. Any change in independent variable rather leads to change in the dependent variables. It is a variable that stand alone and isn’t changed by the other variables. Thus, the independent variables are those variables which are used as basis of prediction.

Non-Performing Loan Ratio

The non- performing loan ratio (NPL) is the ratio of the amount of non- performing loans in a bank’s loan portfolio to the total amount of outstanding loans the bank holds. A loan that is in default because the borrower hasn't paid the agreed-upon payments for a predetermined amount of time is known as a non-performing loan. In banking commercial loans are considered non-performing if the borrower is 90 days past due. The international monetary fund considers loans that are less than 90 days past due as non-performing if there’s high uncertainty surrounding future payment.

Credit Deposit Ratio

The credit deposit ratio (CDR) refers to the credit-deposit ratio in banking parlance. It tells us how much of the money banks have raised in the form of deposits has been deployed as loans. A low CD ratio suggests relatively poor credit growth compared with deposit growth. A high CD ratio would mean strong demand for credit in an environment of relatively slower deposit growth.

Cash Reserve Ratio

Cash reserve ratio (CRR) is among the control variables that are employed to examine how credit risk affects banks' performance. One of the central bank's monetary instruments has historically been the cash reserve ratio. It is the certain percentage of deposits which commercial banks are required to keep as cash reserve with the central bank. It is set according to the guidelines of the central bank of a country. The central bank can adjust the CRR to regulate the quantity of liquidity. A higher reserve requirement will mean that banks have less money available for lending, which would lower the money supply since there will be less capital in the economy.

Capital Adequacy Ratio

A bank's available capital is measured and reported as a proportion of its risk-weighted credit exposure, capital adequacy ratio (CAR). It is the portion of capital that a bank must maintain in accordance with legal requirements. The quantity of capital that a bank or other financial institution must maintain in order to comply with regulations set forth by its financial regulator is known as capital adequacy. This makes it easier to make sure that organizations aren't holding or participating in assets that raise the risk of default. Moreover, to ensure that banks have adequate capital to cover operational losses and process withdrawals.

Base Rate

Base rate (BR) is the minimum rate of interest on which bank can issue loans. In other words, it is the minimum interest rate below which the banks are not permitted to lend their customers. Unless there is a government mandate, the NRB rule specifies that no bank may offer loans at an interest rate lower than the base rate. Loans are priced by adding the base rate to a suitable spread, subject to the credit risk premium. Base rate is calculated by taking majorly five factors into consideration. These include the cost of deposits, administrative costs borne by the bank, cost of reserve maintained by the bank with the central banks, opportunity cost held by the bank, and other fixed assets.

3.5 Methods of Analysis

Various financial and statistical tools have been used to measure the comparative financial analysis and to draw inferences on the study area. Graphs and tables as appropriate have also been used to analyze the data. The descriptive and analytical research method is applied. The collected data have been organized, tabulated, processed and analyzed using various statistical and financial tools as described below.

3.5.1 Financial Tools

Return on Assets

Return on assets (ROA) of the bank is the ratio of the net income to the total assets. It measures the efficiency of the banks and generating profit out of its scarce resources. The higher the profit generated from the employed assets, the more efficient the bank. Mathematically,

$$\text{ROA} = \frac{\text{Net profit after tax}}{\text{Total assets}} \times 100\%$$

Return on Equity

The return on equity (ROE) indicates the relationship between net profits after tax to total equity capital. It finds how efficiently the funds supplied by the shareholders' have been used. It measures the rate of return on shareholders, investment. It is the

relationship between net income after tax and common shareholders, investment which is calculated by net income divided by common equity.

Mathematically,

$$\text{ROE} = \frac{\text{Net profit after tax}}{\text{Equity capital}} \times 100\%$$

Non-performing Loan Ratio

A non-performing loan (NPL) is a loan that is in default due to the fact that the borrower has not made the scheduled payments for a specified period. Although the exact elements of non-performing status can vary depending on the specific loan's terms, "no payment" is usually defined as zero payments of either principal or interest. The specified period also varies, depending on the industry and the type of loan. Generally, however, the period is 90 days or 180 days.

$$\text{NPL} = \frac{\text{Non-performing loan}}{\text{Total loan and advance}} \times 100\%$$

where,

Total non-performing loan = Sub-standard loan + Doubtful loan + Bad loan

Total loan and advances = Total performing loan + Total non-performing loan

Credit Deposit Ratio

The credit-deposit ratio (CDR) broadly means the ratio of assets and liabilities of the banks. It is used for measuring a bank's liquidity by dividing the bank's total loans disbursed by the total deposits received.

$$\text{CDR} = \frac{\text{Average loan outstanding}}{\text{Average deposit}} \times 100\%$$

Capital Adequacy Ratio

Capital adequacy ratio (CAR) is the proportion of banks' Tier 1 and Tier 2 capital as a proportion of its risk weighted assets. Capital adequacy ratio is an expression of a bank's percentage risk weighted credit exposures. Mathematically,

$$\text{CAR} = \frac{\text{Total capital fund}}{\text{Total risk weighted assets}} \times 100\%$$

where,

Total capital fund = Tire 1 capital + Tier 2 capital

Total risk weighted assets = On-balance sheet risk weighted items + Off-balance sheet risk weighted items.

3.5.2 Statistical Tools

Arithmetic Mean

A collection of data is determined by summing all the observations and then dividing by the total number of observations which results the arithmetic mean or simple mean of. This average represents the best value for the entire group of data. Arithmetic mean of a series is given by:

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

where,

X = Value of ratios of each independent or dependent variable

n = Number of years

Standard Deviation

The standard deviation is a measure of the amount of variation or dispersion of a set of values. A low standard deviation indicates that the values tend to be close to the mean (also called the expected value) of the set, while a high standard deviation indicates that the values are spread out over a wider range. The definition of the standard deviation is the square root of the mean that is positive and that is taken from the arithmetic mean. It measures the absolute dispersion. Variability increases with increasing standard deviation and vice versa. The data's deviation from the center value is measured by dispersion. It is beneficial to examine the data's quality in terms of its variability.

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

where,

$\bar{X}$ = Mean value of ratios of each independent or dependent variable

n = Number of years

Correlation Analysis

The statistical method that we may use to characterize how closely one variable is connected to another linearly is called correlation analysis (Bajaracharya, 1996). A positive or direct correlation is present when there is a similar deviation in both variables' values, i.e., an increase or decrease in the value of another variable. This design will adopt to identify the direction and magnitude of linear relationship between different pairs of variables. It shows how two variables move together and also shows the degree of association between them. The relationship will explain by using bi-variant Pearson correlation coefficient. It measures correlation coefficient between two variables X and y is usually denoted by 'r' and can be obtained as:

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

where,

X = Value of independent variable

$\bar{X}$ = Mean value of independent variable

Y = Value of dependent variable

$\bar{Y}$ = Mean value of dependent variable

The value of correlation coefficient ranges from -1 to +1, and interpretation of correlation coefficient (r) is as follows:

1. When, r = +1, there is perfect positive relationship
2. When, r is close to 1, there is strong positive relationship
3. When, r is close to 0 but positive, there is low degree of positive relationship
4. When, r = 0, there is no relationship
5. When, r is close to 0 but negative, there is low degree of negative relationship
6. When, r is close to -1, there is strong negative relationship

Regression Analysis

Regression analysis is a mathematical measure of the average relationship between two or more variables in term of the original units of the data. Regression can therefore be defined as the estimation or prediction of one variable's value based on the known values of other variables. The regression model used in this study assumes that the relationship between each independent variable NPL, CDR, CRR, CAR and

BR; the dependent variable; ROA and ROE. The model used in this study would be stated as;

$ROA = \alpha + \beta_1 NPL + \beta_2 CDR + \beta_3 CRR + \beta_4 CAR + \beta_5 BR + e$ (1)

$ROE = \alpha + \beta_1 NPL + \beta_2 CDR + \beta_3 CRR + \beta_4 CAR + \beta_5 BR + e$ (2)

where,

ROA = Return on assets

ROE = Return on equity

NPL = Non-performing loan ratio

CDR = Loan and advance ratio

CRR = Cash reserve ratio

CAR = Capital adequacy ratio

BR = Base rate

α = constant term

e = error term

β_1 = Regression coefficient of NPL variable

β_2 = Regression coefficient CDR variable

β_3 = Regression coefficient CRR variable

β_4 = Regression coefficient CAR variable

β_5 = Regression coefficient BR variable

CHAPTER IV
RESULTS AND DISCUSSION

The chapter deals with analysis of data through various financial and statistical tools. Presentation and interpretation of data is the main body of the chapter. The data are presented in appropriate format, then analyzed and discussed. The main sources of data are secondary data. In this chapter, collected data related to credit risk management and liquidity, and their impact on profitability of Nepalese commercial banks is presented in different tables and diagrams to make the analysis simple and easy to understand.

4.1 Results

The study deals with the credit risk management and liquidity and their impact on profitability of Nepalese commercial banks. Credit risk management, liquidity and profitability status of Nepalese commercial banks over the 9 years has been analyzed. Mean, standard deviation, coefficient of variation, etc statistical tools have also been used to analyze the credit risk management, liquidity and profitability more effectively.

4.1.1 Non-Performing Loan Ratio (NPL)

This ratio determines the non- performing assets in the total loan advances portfolio. Greater ratio implies the bad quality of loan of the bank. Non-performing Loan (NPL) ratio compares non-performing loans to the total loan portfolio (loans are assets for the bank)**,** and the higher ratio means higher risk of losses for some of the loans. Non-performing loans are those loans that are late on payments (common term is 90 days but it may depend on the financial regulations in the market). Non-performing loan reduce bank's earrings and cause losses, which weighs on their soundness. Banks with high levels of non-performing loans are unable to lend to households and companies. This is harmful to the economy as a whole (Segal, 2020).

Table 1

Non-performing Loan Ratio (in %)

Fiscal Year	Commercial Banks									Mean	SD
	NABIL	SCBL	KBL	SANIMA	PCBL	SBL	EBL	GIBL	ADBL		
2013/14	2.23	0.48	2.75	0.017	2.23	2.75	0.97	2.55	5.46	2.16	1.60
2014/15	1.82	0.34	1.93	0.07	1.83	1.8	0.66	2.23	5.35	1.78	1.55
2015/16	1.14	0.32	0.91	0.019	1.23	1.47	0.38	1.89	4.36	1.30	1.29
2016/17	0.80	0.19	1.87	0.01	0.88	1.30	0.25	1.60	4.60	1.28	1.40
2017/18	0.55	0.18	1.50	0.03	0.85	1.09	0.20	0.77	3.50	0.96	1.06
2018/19	0.74	0.15	1.00	0.08	1.00	0.75	0.16	0.55	3.29	0.86	0.98
2019/20	0.98	0.44	1.4	0.45	1.48	1.38	0.22	0.43	2.84	1.07	0.82
2020/21	0.84	0.96	0.96	0.12	0.99	1.00	0.12	0.33	1.88	0.80	0.55
2021/22	1.62	1.09	1.1	0.33	1.77	1.07	0.12	0.17	2.09	1.04	0.71
Mean	1.19	0.46	1.49	0.13	1.36	1.40	0.34	1.17	3.71	1.25	
SD	0.57	0.34	0.61	0.16	0.49	0.59	0.29	0.90	1.32	0.45	

Source. Annual Reports of Concerned Commercial Banks, 2013/14-2021/22.

Table 1 shows non-performing ratio (NPL) of Nabil Bank Limited (NABIL), Standard Chartered Bank Limited (SCBL), Kumari Bank Limited (KBL), Sanima Bank Limited (SANIMA), Prime Commercial Bank Limited (PCBL), Siddhartha Bank Limited (SBL), Everest Bank Limited (EBL), Global IME Bank Limited (GIBL) and Agricultural Development Bank Limited (ADBL) over 9 different fiscal years. The highest and the lowest NPL over the period are 5.46% and 0.01% respectively. ADBL has the highest and SANIMA has the lowest NPL among 81 observations. The non-performing loan of all commercial banks is in fluctuating trend. However, SANIMA has the highest fluctuation of NPL among other bank even though it has the lowest NPL in all fiscal years and ADBL has the lowest fluctuation of NPL even though it has the highest NPL in all fiscal years. The high non-performing loan ratio indicates that bank's assets are not doing well or the loan department is not so conscious while passing loan. Thus, lower ratio will be preferred regarding non-performing loan ratio.

4.1.2 Credit Deposit Ratio

Credit deposit ratio (CDR) also known as loan to deposit ratio is the ratio that shows how much a bank lends out of the deposits it has mobilized which compares the size of a bank's loan book to its deposits to analyze the bank's funding strategy. It indicates how much a bank funds are being used for lending, the main banking activity. It is used to asses a bank's liquidity by comparing a bank's total loan to its total deposits for the same period. If the ratio is too low, banks may not be earning as much as they could be. If the ratio is too high, it means that banks might not have enough liquidity to cover any unforeseen fund requirements, may affect capital adequacy and assets liability mismatch (Murphy, 2020).

Table 2

Credit Deposit Ratio (in %)

Fiscal Year	Commercial Banks									Mean	SD
	NABIL	SCBL	KBL	SANIMA	PCBL	SBL	EBL	GIBL	ADBL		
2013/14	74.55	56.87	80.30	82.90	69.10	79.02	78.01	82.27	94.80	77.54	10.41
2014/15	64.43	48.92	80.43	83.97	81.63	83.03	66.63	83.47	93.77	76.25	13.65
2015/16	70.49	56.88	81.98	88.10	85.00	87.02	73.52	81.47	95.46	79.99	11.47
2016/17	65.38	62.20	81.93	89.03	89.12	88.40	84.05	79.30	92.90	81.37	10.82
2017/18	82.66	66.45	88.02	87.45	87.53	86.08	81.86	96.34	95.64	85.78	8.79
2018/19	81.96	70.11	89.42	90.42	89.15	89.65	87.01	94.79	93.62	87.35	7.44
2019/20	79.72	56.75	88.69	85.10	88.97	89.04	83.52	87.25	85.84	82.76	10.21
2020/21	89.84	71.27	91.54	94.10	89.23	90.60	85.30	91.70	92.93	88.50	6.93
2021/22	92.49	73.45	90.98	89.18	93.65	96.08	90.77	97.92	107.01	92.39	8.90
Mean	77.95	62.54	85.92	87.81	85.93	87.66	81.19	88.28	94.66	83.55	
SD	10.01	8.30	4.67	3.47	7.12	4.81	7.40	7.06	5.48	5.36	

Source. Annual Reports of Concerned Commercial Banks, 2013/14-2021/22.

Table 2 shows credit deposit ratio (CDR) of Nabil Bank Limited (NABIL), Standard Chartered Bank Limited (SCBL), Kumari Bank Limited (KBL), Sanima Bank Limited (SANIMA), Prime Commercial Bank Limited (PCBL), Siddhartha Bank

Limited (SBL), Everest Bank Limited (EBL), Global IME Bank Limited (GIBL) and Agricultural Development Bank Limited (ADBL) over 9 different fiscal years. customers for every rupees received in deposits it received. KBL, SANIMA and SBL The highest and the lowest CDR over the period are 107.01% and 48.92% respectively. ADBL has the highest in 2021/22 and SCBL has the lowest CDR in 2014/15 among 81 observations. The credit deposit ratio of all commercial banks is in fluctuating trend. However, SCBL has the highest fluctuation and SANIMA has the lowest fluctuation on CDR among other bank. Typically, the ideal loan-to-deposit ratio or credit deposit ratio is 70% to 90%. A loan-to-deposit ratio of 100% means a bank loaned one rupee to have the ideal CDR in all fiscal years which indicates sound credit management of than the other commercial banks. ADBL has CDR above the ideal credit deposit ratio indicating poor credit management in comparison to other commercial banks.

4.1.3 Cash Reserve Ratio (CRR)

A control variable used to examine how credit risk affects banks' performance is the cash reserve ratio (CRR). Historically, the cash reserve ratio has been one of the central bank's key monetary instruments. CRR is the certain percentage of deposits which commercial banks are required to keep as cash reserve with the central bank. It is set according to the guidelines of the central bank of a country. The quantity of liquidity may be managed by the central bank by adjusting CRR. The quantity of capital in the economy is essentially reduced when the reserve requirement is raised, which means that banks will have less money to lend out and the money supply will be reduced. This would impede economic growth by reducing available funds for expenditure and investment. Also, banks would have to accept a potential drop in profitability as a result of earning less interest. Additionally, the cash reserve requirement is a financial burden on commercial banks as it generates no revenue for them (Li and Zou, 2014).

Table 3

Cash Reserve Ratio (in %)

Fiscal Year	Commercial Banks									Mean	SD
	NABIL	SCBL	KBL	SANIMA	PCBL	SBL	EBL	GIBL	ADBL		
2013/14	11.32	21.18	13.00	26.68	11.11	17.22	16.91	31.11	30.43	19.88	7.90
2014/15	14.15	24.03	17.92	22.32	10.83	8.63	24.27	30.12	28.74	20.11	7.67
2015/16	6.77	7.98	12.95	24.24	10.97	6.00	16.61	35.14	23.33	16.00	9.83
2016/17	10.02	19.71	22.35	26.08	13.27	8.68	16.52	33.54	31.18	20.15	8.92
2017/18	10.05	18.91	12.07	24.72	11.42	6.38	17.75	25.34	29.15	17.31	7.88
2018/19	4.78	7.52	8.88	22.87	9.83	4.56	18.56	27.29	27.20	14.61	9.40
2019/20	11.20	14.49	3.78	24.01	7.25	5.03	14.43	30.37	33.98	16.06	11.00
2020/21	3.61	7.53	3.72	22.15	7.18	3.54	18.15	35.67	36.21	15.31	13.43
2021/22	4.13	4.44	3.78	27.07	5.50	3.23	6.59	28.91	25.96	12.18	11.42
Mean	8.45	13.98	10.94	24.46	9.71	7.03	16.64	30.83	29.58	16.85	
SD	3.74	7.25	6.59	1.84	2.51	4.29	4.63	3.47	3.96	2.77	

Source. Annual Reports of Concerned Commercial Banks, 2013/14-2021/22.

Table 3 represents cash reserve ratio (CRR) of Nabil Bank Limited (NABIL), Standard Chartered Bank Limited (SCBL), Kumari Bank Limited (KBL), Sanima Bank Limited (SANIMA), Prime Commercial Bank Limited (PCBL), Siddhartha Bank Limited (SBL), Everest Bank Limited (EBL), Global IME Bank Limited (GIBL) and Agricultural Development Bank Limited (ADBL) over 9 different fiscal years. ADBL has the highest in 2020/21 and SBL has the lowest CRR in 2021/22 with 36.21% and 3.23% cash reserve respectively. The cash reserve ratio of all commercial banks is in fluctuating trend. However, KBL has the highest fluctuation on CRR among other bank. GIBL has the highest CRR in six fiscal years and ADBL has the highest RR in three fiscal years among 81 observations. The high cash reserve ratio indicates that the bank has lower amount of money available to lend out or invest resulting the lower liquidity. CRR is set according to the guidelines of the central bank of a country. Nepal Rastra Bank (NRB) determines the cash reserve ratio in Nepal for the commercial banks. All commercial banks have maintained the required cash reserve ratio as per NRB directives in all fiscal years.

4.1.4 Capital Adequacy Ratio (CAR)

A bank's capital level represented as a percentage of its risk-weighted credit exposure is called the capital adequacy ratio, which is determined by dividing the total amount of capital by the risk-weighted sum of the bank's assets (Poudel, 2012). The percentage of capital that a bank must maintain in accordance with regulatory requirements is known as this. Reddy and Prasad (2011) stated the imperative to uphold a designated capital adequacy ratio (CAR) to ascertain the ability of banks to absorb losses and guarantee that, in the worst case, they would still be able to suffer bearable losses. A bank is generally thought to be low risk and likely to fulfill its financial obligations if its CAR is high. Depositor security and financial system stability will increase with a larger ratio. It may be argued that having sufficient capital in a bank helps to increase profitability since it allows the bank to absorb potential losses and avoid bankruptcy or insolvency.

Table 4

Capital Adequacy Ratio (in %)

Fiscal Year	Commercial Banks									Mean	SD
	NABIL	SCBL	KBL	SANIMA	PCBL	SBL	EBL	GIBL	ADBL		
2013/14	11.24	12.27	11.51	12.54	13.82	11.39	11.31	12.38	14.93	12.38	1.26
2014/15	11.57	13.10	11.29	11.08	12.16	11.10	13.33	12.69	13.90	12.25	1.05
2015/16	11.73	16.38	11.92	12.36	11.60	11.25	12.66	12.35	17.16	13.05	2.16
2016/17	12.90	21.08	10.71	15.57	13.28	12.74	14.54	11.37	20.41	14.73	3.71
2017/18	13.00	22.99	11.18	12.41	12.24	12.12	14.20	13.15	20.33	14.62	4.13
2018/19	12.50	19.69	14.30	13.91	12.76	12.70	13.74	14.16	20.37	14.90	2.98
2019/20	13.07	18.51	13.84	13.00	13.84	13.17	13.38	14.16	19.29	14.70	2.42
2020/21	12.77	17.17	13.75	13.57	14.82	13.36	12.48	14.30	16.94	14.35	1.69
2021/22	13.09	20.54	12.44	13.66	13.12	13.00	11.89	14.88	15.59	14.25	2.63
Mean	12.43	17.97	12.33	13.12	13.07	12.31	13.06	13.27	17.66	13.91	
SD	0.72	3.61	1.33	1.26	1.00	0.88	1.06	1.16	2.53	1.06	

Source. Annual Reports of Concerned Commercial Banks, 2013/14-2021/22.

Table 4 shows capital adequacy ratio (CAR) of Nabil Bank Limited (NABIL), Standard Chartered Bank Limited (SCBL), Kumari Bank Limited (KBL), Sanima Bank Limited (SANIMA), Prime Commercial Bank Limited (PCBL), Siddhartha Bank Limited (SBL), Everest Bank Limited (EBL), Global IME Bank Limited (GIBL) and Agricultural Development Bank Limited (ADBL) over 9 different fiscal years. Like, cash reserve ratio (CRR), capital adequacy ratio (CAR) is also determined by Nepal Rastra Bank (NRB), and the commercial banks should maintain the minimum capital adequacy ratio according to the guidelines of the central bank of a country. The minimum capital adequacy ratio (CAR) set by NRB through its unified directives is 10% for all fiscal years for commercial banks operating in Nepal. All the banks have maintained the minimum CAR in all fiscal years. However, the highest and the lowest CAR have been maintained by SCBL in FY 2017/18 and KBL in FY 2016/17 with CAR value of 22.99% and 10.71% respectively. Banks with high CAR are often seen as low risk and reliable payers of their debts. The stability of the financial system and safety for depositors will increase with a larger percentage.

4.1.5 Base Rate

Base rate is the minimum rate of interest on which bank can issue loans. In other words, it is the minimum interest rate below which the banks are not permitted to lend their customers. Unless there is a government mandate, the NRB rule specifies that no bank may offer loans at an interest rate lower than the base rate. Loans are priced by adding the base rate to a suitable spread, subject to the credit risk premium. Base rate is calculated by taking majorly five factors into consideration. These include the cost of deposits, administrative costs borne by the bank, cost of reserve maintained by the bank with the central banks, opportunity cost held by the bank, and other fixed assets. However, for the time being, the cost of fixed assets has been halted by NRB for being included in the calculation of the base rate (Vaidya, 2020).

Table 5

Base Rate (in %)

Fiscal Year	Commercial Banks									Mean	SD
	NABIL	SCBL	KBL	SANIMA	PCBL	SBL	EBL	GIBL	ADBL		
2013/14	5.67	5.18	9.85	8.22	10.08	8.81	6.40	10.37	6.24	7.87	2.03
2014/15	5.78	4.92	8.18	7.50	7.62	7.87	6.14	9.52	6.97	7.17	1.39
2015/16	4.17	4.47	7.44	6.07	6.93	6.65	6.14	8.55	7.15	6.40	1.39
2016/17	6.61	6.47	9.32	10.20	10.64	10.38	7.68	7.63	11.27	8.91	1.84
2017/18	7.78	7.87	11.92	9.91	10.47	11.16	8.45	9.83	11.73	9.90	1.58
2018/19	8.09	7.63	10.23	9.45	10.03	10.57	8.12	7.44	10.58	9.13	1.30
2019/20	7.32	7.00	9.03	8.62	8.62	9.03	6.05	8.71	9.26	8.18	1.12
2020/21	5.86	5.51	7.57	6.34	7.21	7.16	5.99	9.98	7.13	6.97	1.34
2021/22	8.77	5.67	9.57	9.71	9.99	9.45	8.82	10.67	8.90	9.06	1.41
Mean	6.67	6.08	9.23	8.45	9.07	9.01	7.09	9.19	8.80	8.18	
SD	1.45	1.22	1.41	1.54	1.48	1.56	1.16	1.17	2.05	1.17	

Source. Annual Reports of Concerned Commercial Banks, 2013/14-2021/22.

Table 5 shows base rate (BR) of Nabil Bank Limited (NABIL), Standard Chartered Bank Limited (SCBL), Kumari Bank Limited (KBL), Sanima Bank Limited (SANIMA), Prime Commercial Bank Limited (PCBL), Siddhartha Bank Limited (SBL), Everest Bank Limited (EBL), Global IME Bank Limited (GIBL) and Agricultural Development Bank Limited (ADBL) over 9 different fiscal years. Like, CRR and CAR, the base rate is also determined by Nepal Rastra Bank (NRB), and the commercial banks should maintain the minimum base rate according to the guidelines of the central bank of a country. The highest and the lowest BR have been maintained by KBL in FY 2017/18 and NABIL in FY 2015/16 with base rate of 11.92% and 4.17% respectively. The base rate of all commercial banks is in fluctuating trend. However, ADBL has the highest and GIBL has the lowest base rate among the observations.

4.1.6 Return on Assets (ROA)

The amount relating net income after taxes to a bank's total assets is called the return on assets. It is essentially a measure of the managers' ability to effectively use the resources of the organization to generate net profits. It measures the profitability of the bank. This ratio indicates a firm's ability of generating profit utilizing the total assets. Higher the ROA, higher is the quality of assets and efficient asset utilization.

Table 6

Return on Assets (in %)

Fiscal Year	Commercial Banks									Mean	SD
	NABIL	SCBL	KBL	SANIMA	PCBL	SBL	EBL	GIBL	ADBL		
2013/14	2.89	2.51	1.46	1.46	1.61	1.74	2.25	1.62	1.76	1.92	0.51
2014/15	2.06	1.99	1.14	1.55	1.63	1.51	1.85	1.39	0.93	1.56	0.38
2015/16	2.32	1.98	2.03	1.78	2.05	1.69	1.85	1.58	0.58	1.76	0.49
2016/17	2.69	1.84	0.59	1.86	1.89	1.53	1.83	1.75	2.15	1.79	0.56
2017/18	2.61	2.61	1.83	1.85	1.82	1.59	1.97	1.65	2.71	2.07	0.44
2018/19	2.11	2.61	1.15	2.07	2.15	1.49	1.94	1.31	2.77	1.96	0.55
2019/20	1.58	1.71	1.14	1.41	1.48	1.26	1.42	1.33	1.86	1.47	0.22
2020/21	1.71	1.22	0.99	1.44	1.72	1.25	0.89	1.88	1.59	1.41	0.34
2021/22	1.20	1.14	1.00	1.09	1.33	1.10	1.13	1.05	0.90	1.10	0.12
Mean	2.13	1.96	1.26	1.61	1.74	1.46	1.68	1.51	1.69	1.67	
SD	0.56	0.55	0.45	0.30	0.26	0.22	0.44	0.26	0.78	0.31	

Source. Annual Reports of Concerned Commercial Banks, 2013/14-2021/22.

Table 6 represents return on assets (ROA) of Nabil Bank Limited (NABIL), Standard Chartered Bank Limited (SCBL), Kumari Bank Limited (KBL), Sanima Bank Limited (SANIMA), Prime Commercial Bank Limited (PCBL), Siddhartha Bank Limited (SBL), Everest Bank Limited (EBL), Global IME Bank Limited (GIBL) and Agricultural Development Bank Limited (ADBL) over 9 different fiscal years. The highest and the lowest ROA over the period are 2.89% and 0.58% respectively. NABIL has the highest ROA in FY 2013/14 whereas ADBL has the lowest ROA in

FY 2015/16 among 81 observations. The bank with higher ROA indicates high quality of assets and efficient asset utilization and vice versa. The return on assets of all commercial banks is in fluctuating trend. However, ADBL has the highest fluctuation and SBL has the lowest fluctuation on ROA among other bank. The higher ROA indicates higher profitability and more efficient asset utilization.

4.1.7 Return on Equity (ROE)

The link between total equity capital and net profits after taxes is shown by the return on equity. It finds how efficiently the funds supplied by the shareholders' have been used. It indicates the firm's ability of generating profit by utilizing equity shareholder's fund. Thus, ROE is considered a gauge of a bank's profitability and how efficient it is in generating profits. The higher ratio implies the efficiency of the management in utilizing of shareholder's funds and vice-versa. It is considered best practice to calculate ROE because of mismatch between the income statement and balance sheet. Net income over the last fiscal year is found on the income statement and shareholders' equity comes from the balance sheet.

Table 7

Return on Equity (in %)

Fiscal Year	Commercial Banks									Mean	SD
	NABIL	SCBL	KBL	SANIMA	PCBL	SBL	EBL	GIBL	ADBL		
2013/14	27.97	26.27	24.13	15.09	14.78	34.77	72.50	19.82	24.14	28.83	17.54
2014/15	22.73	21.69	14.76	18.19	20.66	31.87	57.40	15.56	25.19	25.34	13.09
2015/16	25.61	17.18	30.06	22.69	24.46	28.26	37.56	19.33	20.00	25.02	6.31
2016/17	22.41	11.98	21.36	14.39	18.27	26.76	25.94	22.57	18.08	20.20	4.97
2017/18	20.94	18.66	28.67	18.67	21.46	23.62	31.85	23.64	23.76	23.47	4.39
2018/19	17.17	19.49	28.05	23.20	23.56	25.40	37.67	26.76	24.25	25.06	5.82
2019/20	13.61	15.15	11.85	16.09	16.06	21.90	29.57	15.32	18.27	17.54	5.33
2020/21	15.19	9.44	14.16	18.57	20.32	26.04	19.82	17.75	19.37	17.85	4.63
2021/22	9.78	8.43	15.00	14.13	14.94	23.17	26.19	20.84	10.53	15.89	6.23
Mean	19.49	16.48	20.89	17.89	19.39	26.87	37.61	20.18	20.40	22.13	
SD	5.95	5.85	7.12	3.35	3.59	4.20	16.92	3.76	4.63	4.42	

Source. Annual Reports of Concerned Commercial Banks, 2013/14-2021/22.

Table 7 represents return on equity (ROE) of Nabil Bank Limited (NABIL), Standard Chartered Bank Limited (SCBL), Kumari Bank Limited (KBL), Sanima Bank Limited (SANIMA), Prime Commercial Bank Limited (PCBL), Siddhartha Bank Limited (SBL), Everest Bank Limited (EBL), Global IME Bank Limited (GIBL) and Agricultural Development Bank Limited (ADBL) over 9 different fiscal years. The highest and the lowest ROE over the period are 72.50% and 8.43% respectively. EBL has the highest ROE in FY 2013/14 whereas SCBL has the lowest ROE in FY 2021/22 among 81 observations. All banks have positive ROE over all fiscal years. The returns on equity of all commercial banks are in fluctuating trend. However, EBL has the highest fluctuation and SBL has the lowest fluctuation on ROE among other bank. The higher ROE indicates higher profitability and more efficient utilization of shareholders' fund.

4.1.8 Descriptive Statistics

This section deals with the impact of credit risk management and liquidity measured in terms of non-performing loan ratio (NPL), credit deposit ratio (CDR) cash reserve ratio (CRR), capital adequacy ratio (CAR), and base rate (BR) on profitability measured by return on equity (ROE) and return on assets (ROA) of commercial banks in Nepal.

Table 8

Descriptive Statistics of NPL, CDR, CRR, CAR, BR, ROA and ROE

Variables	N	Minimum	Maximum	Mean	Std. Deviation
NPL	81	0.01	5.46	1.25	1.18
CDR	81	48.92	107.01	83.55	10.80
CRR	81	3.23	36.21	16.85	9.74
CAR	81	10.71	22.99	13.91	2.70
BR	81	4.17	11.92	8.18	1.81
ROA	81	0.58	2.89	1.67	0.50
ROE	81	8.43	72.5	22.13	9.28

Table 8 shows descriptive statistics of nine sampled commercial banks over nine different years from 2013/14 to 2021/22. The total number of observation (N) was 81 for variable. Descriptive statistics shows that the mean of the NPL is 1.25% with standard deviation of 1.18% and ranges from 0.01% to 5.46%. This implies that value of NPL can vary on both sides by 1.18%. The mean of the CDR is 83.55% with standard deviation of 10.80% and ranges from 48.92% to 107.01%. This implies that value of CDR can vary on both sides by 10.80%. Similarly, the mean of the CRR is 16.85% with standard deviation of 9.74% and ranges from 3.23% to 36.21%. This implies that value of CRR can vary on both sides by 9.74%. Likewise, the mean of the CAR is 13.91% with standard deviation of 2.70% and ranges from 22.99% to 13.91%. This implies that value of CAR can vary on both sides by 2.70%. The mean of the BR

is 8.18% with standard deviation of 1.81% and ranges from 4.17% to 11.92%. This implies that value of BR can vary on both sides by 1.81%. Furthermore, the mean of the ROA is 1.67% with standard deviation of 0.50% and ranges from 0.58% to 2.89%. This implies that value of ROA can vary on both sides by 0.50%. The mean of the ROE is 22.13% with standard deviation of 9.28% and ranges from 8.43% to 72.50%. This implies that value of ROE can vary on both sides by 69.28%.

4.1.9 Correlation Analysis

Seven factors have been found by the investigation. Whether there is a positive or negative link between two variables, correlation analysis entails examining and quantifying the degree of that association. A positive or direct correlation occurs when the two variable values vary in the same direction, that is, when the value of one variable increase or decreases. It also indicates whether the relationship is significant or insignificant and the correlation analysis is used to identify the relationship between of non-performing loan ratio (NPL), credit deposit ratio (CDR) cash reserve ratio (CRR), capital adequacy ratio (CAR), and base rate (BR) on profitability measured by return on equity (ROE) and return on assets (ROA)

Table 9

Correlation Analysis

	NPL	CDR	CRR	CAR	BR	ROA	ROE
NPL	1						
CDR	0.2623*	1					
CRR	0.2340*	0.1298	1				
CAR	0.1534	-0.0788	0.2113	1			
BR	0.1700	0.5490*	0.1332	0.0367	1		
ROA	-0.0742	-0.4069*	0.0501	0.1996	-0.1147	1	
ROE	-0.0136	-0.1061	0.0246	-0.2915*	-0.1411	0.2852*	1

Note. * indicates that correlation is significant at the 5% level

Table 9 explains the correlation between various credit risk management and liquidity factors affecting profitability of commercial banks in Nepal. The major focus is given to NPL, CDR, CRR, CAR, BR, ROA and ROE. CDR and BR have highest influences in each other with a positive 0.5490 correlation score and the correlation is significant. The low degree of significant positive correlation can be traced between CDR and NPL; CRR and NPL; ROE and ROA with correlation value of 0.2623, 0.2340 and 0.2852 respectively among the variables. On the hand, the low degree of significant negative correlation can be traced between ROA and CDR; ROE and CAR with correlation value of -0.4069 and -0.2915 respectively among the variables. The low degree of significant positive correlation can be traced between CAR and NPL; BR and NPL; CDR and CAR; CAR and CRR; BR and CRR; ROA and CAR with correlation value of 0.1534, 0.1700, 0.1298, 0.2113, 0.1332 and 0.1996 respectively. The least negative correlation can be found between CAR and CDR; ROA and NPL; ROE and NPL; ROE and CDR; ROA and BR with correlation value of –0.0788, -0.0742, -0.0136, -0.1061 and -0.1147 respectively which all are insignificant.

4.1.10 Regression Analysis

Whereas in basic regression analysis, a single independent variable is used to estimate the values of a dependent variable, in coefficient analysis, two or more independent variables are used to estimate the values of dependent variables. To determine the relative movement of the variable, multiple regression analysis is helpful. To put it another way, multiple regression analysis uses two or more independent variables rather than just one to predict the value of a dependent variable. In the study, return on equity (ROE), and return on assets (ROA) are the dependent variable and non-performing loan ratio (NPL), credit deposit ratio (CDR), cash reserve ratio (CRR), capital adequacy ratio (CAR), and base rate (BR) are the independent variables.

4.1.10.1 Regression Relationship of ROA with NPL, CDR, CRR, CAR and BR

Table 10

Result of Regression Analysis

Model 1: ROA						
Variable	Constant	NPL	CDR	CRR	CAR	BR
Coefficient	2.7834	-0.0100	-0.4747	0.0656	0.1450	0.1336
t-statistic	5.4535	-0.0907	-3.7353	0.6080	2.3551	1.0818
p-value	0.0000	0.9280	0.0004	0.5451	0.0379	0.2828
Adjusted R^2						0.3592
F-statistic (F-value)						4.0077 (0.0028)
$ROA = a + \beta_1 NPL + \beta_2 CDR + \beta_3 CRR + \beta_4 CAR + \beta_4 BR$						

Table 10 shows the model summary for the regression analysis of the return on assets (ROA) with NPL, CDR, CRR, CAR and BR of sampled commercial banks in Nepal. The regression result of Model 1, where ROA is the dependent variable reports that the relationship with NPL, CDR, CRR, CAR and BR is positive and insignificant at 5% level of significance with F-value 0.0028. The adjusted R square is 0.3592 which shows the model explanatory power depicted that 35.92% of the changes in the return on assets (ROA) in nine sampled commercial banks be explained by the five variables (NPL, CDR, CRR, CAR and BR) while the remaining percentage can be explained by other factors excluded in the model. The study findings revealed that the beta coefficients of NPL, CDR, CRR, CAR and BR are -0.0161, -0.4747, 0.0656, 0.1450 and 0.1336 respectively. It means that a unit change in NPL, CRR, CAR and CDR lead -0.0161, -0.4747, 0.0656, 0.1450 and 0.1336 unit changes in ROA of sample commercial banks respectively.

There is insignificant relationship between ROA and all variables except CAR and CDR since the P value are higher than 0.05 at 5% level of significance for all variables except CAR and CDR. The calculated test statistic (i.e. t -ratio) between

ROA and NPL, CDR, CRR, CAR and BR was -0.0917, -3.7353, 0.6080, 2.3551 and 1.0818 respectively. Since, the tabulated test statistics t at 5% level of significance and df = 80 for two tailed test is ± 1.9901; there is insignificant relationship between ROA and NPL, CRR and BR because the calculated t-value $|t_{cal}|$ of these variables is less than tabulated t-value $|t_{tab}|$ = 1.9901 except for CAR and CDR. Therefore, both of the test i.e. p-value and t-value conclude there is insignificant relationship between ROA and NPL; ROA and CRR; ROA and BR, and significant relationship between ROA and CAR; ROA and CDR.

The regression model/line is given by following equation:

ROA = 2.783 – 0.016 NPL – 0.475 CDR + 0.066 CRR + 0.145 CAR + 0.134 BR

This implies that a unit changes in the NPL, CDR, CRR, CAR and BR leads to -0.0161, -0.4747, 0.0656, 0.1450 and 0.1336 change in return on assets (ROA) of sampled commercial banks in Nepal. The return on assets (ROA) of commercial banks in Nepal has negligible influenced by all variables except CDR. NPL and CDR have low degree of negative impact on ROA whereas the rest variables (CRR, CAR and BR) have low degree of positive impact on ROA.

4.1.10.2 Regression Relationship of ROE with NPL, CDR, CRR, CAR and BR

Table 11

Result of Regression Analysis

Model 2: ROE						
Variable	Constant	NPL	CDR	CRR	CAR	BR
Coefficient	4.7306	0.0562	-0.1097	0.1073	-0.3280	-0.0926
t-statistic	4.7423	0.4849	-2.0186	0.9424	-2.9074	-0.7113
p-value	0.0000	0.6291	0.0416	0.3490	0.0048	0.4791
Adjusted R^2						0.3039
F-statistic (F-value)						2.088 (0.0076)
$ROE = a + \beta_1 NPL + \beta_2 CDR + \beta_3 CRR + \beta_4 CAR + \beta_4 BR$						

Table 11 shows the model summary for the regression analysis of the return on equity (ROE) with NPL, CDR, CRR, CAR and BR of sampled commercial banks in Nepal. The regression result of Model 1, where ROE is the dependent variable reports that the relationship with NPL, CDR, CRR, CAR and BR is positive and insignificant at 5% level of significance with F-value 0.0076. The adjusted R square is 0.3039 which shows the model explanatory power depicted that 30.39% of the changes in the return on equity (ROE) in nine sampled commercial banks be explained by the five variables (NPL, CDR, CRR, CAR and BR) while the remaining percentage can be explained by other factors excluded in the model. The study findings revealed that the beta coefficients of NPL, CDR, CRR, CAR and BR are 0.0562, -0.1097, 0.1073, -0.3280 and -0.0926 respectively. It means that a unit change in NPL, CRR, CAR and CDR lead 0.0562, -0.1097, 0.1073, -0.3280 and -0.0926 unit changes in ROE of sample commercial banks respectively.

There is insignificant relationship between ROE and all variables except CAR and CDR since the P value are higher than 0.05 at 5% level of significance for all variables except CAR and CDR. The calculated test statistic (i.e. t -ratio) between ROA and NPL, CDR, CRR, CAR and BR was 0.4849, -2.0186, 0.9424, -2.9074 and -0.7113 respectively. Since, the tabulated test statistics t at 5% level of significance and df = 80 for two tailed test is ± 1.9901; there is insignificant relationship between ROE and NPL, CRR and BR because the calculated t-value $|t_{cal}|$ of these variables is less than tabulated t-value $|t_{tab}| = 1.9901$ except for CAR and CDR. Therefore, both of the test i.e. p-value and t-value conclude there is insignificant relationship between ROE and NPL; ROE and CRR; ROE and BR, and significant relationship between ROE and CAR; ROE and CDR.

The regression model/line is given by following equation:

ROE = 4.731 + 0.0562 NPL – 0.110 CDR + 0.107 CRR – 0.328 CAR – 0.093 CDR

This implies that a unit changes in the NPL, CDR, CRR, CAR and BR leads to 0.0562, -0.1097, 0.1073, -0.3280 and -0.0926 change in return on equity (ROE) of sampled commercial banks in Nepal. The return on equity (ROE) of commercial banks in Nepal has negligible influenced by all variables except CAR. CDR, CAR

and BR have low degree of negative impact on ROE whereas the rest variables (NPL and CRR) have low degree of positive impact on ROE.

4.2 Discussion

The study has identified NPL, CDR, CRR, CAR and BR as the independent variables affecting the profitability (ROA and ROE) of the commercial banks. The correlation between the liquidity and profitability in terms of both ROA and ROE are insignificant. However, the correlation between credit risk management and profitability is significant. On other hand, the regression of profitability on credit risk management variables (CRR and CAR) is significant. There is low degree of impact on profitability of Nepalese commercial banks due to credit risk management and liquidity. Profitability is a wide area and only few percentages of the changes in the ROA and ROE are described by the credit risk management and liquidity.

The result of the study is consistent to Harb et al. (2023), Kidane (2020), Bhattarai (2019), Samo and Murad (2019), Opoku (2016), Wolday (2015), Ugoani (2015), Bhattrai (2014), Adeusi et al (2014), Epure and Lafuente (2012), Paudel (2012), Aloy (2012), Chen and Pan (2012) and Kithinji (2010) that there is very low impact of credit risk management and liquidity on profitability of commercial banks.

Thammakitsopon et al. (2022), Hamdi and Hakimi (2019); Dhungana and Pradhan (2017), Alshatti (2015), Adeusi et al (2014); Paudel (2012) has supported on a negative and significant effect of credit deposit ratio (CDR) on profitability. Aluonzi et al. (2024), Kidane (2020), Tuladhar (2017), Waleed (2016), Ogboi and Unuafe (2013) who found positive and significant impact of capital adequacy ratio (CAR) on ROA and Wolday (2015) who found negative but significant impact of CAR on ROE is consistent result to the study. The significant positive impact of NPL on ROE is another consistent result to Harb et al. (2023), Iftikhar (2016), Kurawa and Garba (2014), Abiola and Olausi (2014) and, Afriyie and Akotey (2012). Capital adequacy ratio was the most influencing factor of profitability which has been supported by Samo and Murad (2019).

The study has also found the insignificant but positive impact of base rate (BR) on profitability of the bank which is consistent to the empirical studies of Harb et al. (2023), Banu et al. (2021), Ahmad (2016), Nimer et. al. (2015); Bhunia (2013); Saleem and Rehman (2011); Gill and Mathur (2011); Aloy (2012). The insignificant positive impact of cash reserve ratio (CRR) on profitability in terms of ROA is another consistent result to Thammakitsopon et al. (2022), Tuladhar (2017), Iftikhar (2016), Kurawa and Garba (2014), Abiola and Olausi (2014) and, Afriyie and Akotey (2012).

The result is contrary to Aluonzi et al. (2024), Banu et al. (2021), Kodithuwakku (2015), Mekasha (2001) who found a significant positive relationship between non-performing loans and banks' profitability. The result is contrary to Raheman and Nasr (2007) who negative impact of liquidity on profitability and to Ben-Naceur and Omran (2008) who empirically verified that NPL has negative effect on the profitability measured by ROE. Ahmed (2015) who found significant impact of liquidity on profitability, and Kidane (2020); Samo and Murad (2019); Vintila and Nenu (2016); Al-Khouri (2011); Ahmad and Ariff (2007) who found the banks' profitability are more sensitive to credit risks management and liquidity is another contradiction to the study.

Therefore, the results discussed above confirm that the credit risk management and liquidity affect profitability of commercial banks in Nepal. The results report a negative and significant association between credit deposit ratio (CDR) and profitability (ROA and ROE), demonstrating an increase in profitability due to a decrease in credit deposit ratio and vice versa. The study has determined capital adequacy ratio (CAR) have significant positive impact on profitability if ROA is used as a proxy for profitability and significant positive impact on profitability if ROE is used as a proxy for profitability which has been supported by most of the empirical studies. However, the significant impact of liquidity on profitability has become a contrary to most of the empirical studies.

CHAPTER V
SUMMARY AND CONCLUSION

5.1 Summary

There had been a been a wave of mergers between big commercial banks in Nepal and after the recent mergers, the number of commercial banks is twenty (Subedi & Timilsina, 2023). The core function of the commercial banks is mobilizing the deposits and utilizing it for lending to industry. However, lending also carries credit risk, which arises from the failure of borrowers to fulfill its contractual obligation during the course of transaction. Thus, the study has been conducted with the objective of analyzing the credit risk management and as well as its impact on profitability of commercial banks in Nepal. Among 20 commercial banks operating in Nepal, nine commercial banks have been selected for the purpose of the study using purposive sampling technique with one government-owned i.e. Agricultural Development Bank Limited, three joint ventures i.e. Nabil Bank Limited, Standard Chartered Bank Limited and Everest Bank Limited, and five private commercial banks i.e. Kumari Bank Limited, Sanima Bank Limited, Prime Commercial Bank Limited, Siddhartha Bank Limited, and Global IME Bank Limited so that the study covers different ownership categories prevalent in the banking industry.

The study has used descriptive research design to analyze the credit risk management situation of Nepalese commercial banks and casual comparative research design to examine the impact of credit risk management on profitability. Non-performing loan ratio, credit deposit ratio, cash reserve ratio, capital adequacy ratio, and base rate are the identified independent variables affecting the profitability of the development banks. Return on assets and return on equity are the identified profitability indicators in the study. Correlation analysis has been used to determine the relationship between the identified variables and multiple regression model has been used to examine the impact of credit risk management on profitability of commercial banks in Nepal.

The study has given the real picture of the credit risk management and profitability analysis and the impact of credit risk management on profitability which might be

significant to the investors, bankers, its shareholders, depositor and all general public who are interested on this current affair of banking industry. Besides, the study is equally important to the organizations for they can get valuable suggestions which may be fruitful in taking corrective actions if any deviation is found on the past performance regarding with management of credit risk. On other hand, the study provides literature to the researchers who want to carry on further research in this field. The study is important as it provides theoretical as well as conceptual framework of different aspects of credit risk management and its impact on the profitability of commercial banks.

The non-performing loan ratio (NPL), credit deposit ratio (CDR), cash reserve ratio (CRR), capital adequacy ratio (CAR), base rate (BR), return on assets (ROA) and return on equity (ROE) of all commercial banks are in fluctuating trend. The results report a negative and significant association between credit deposit ratio (CDR) and profitability (ROA and ROE), demonstrating an increase in profitability due to a decrease in credit deposit ratio and vice versa which is consistent to Thammakitsopon et al. (2022), Hamdi and Hakimi (2019); Dhungana and Pradhan (2017), Alshatti (2015), Adeusi et al (2014); and Paudel (2012). The study has determined capital adequacy ratio (CAR) have significant positive impact on profitability if ROA is used as a proxy for profitability and significant positive impact on profitability if ROE is used as a proxy for profitability which has been supported by most of the empirical studies which is supported by Aluonzi et al. (2024), Kidane (2020), Tuladhar (2017), Waleed (2016), Wolday (2015) and Ogboi and Unuafe (2013).

The study has also found the insignificant but positive impact of base rate on profitability of the bank which is consistent to the empirical studies of Harb et al. (2023), Banu et al. (2021), Ahmad (2016), Nimer et. al. (2015); Bhunia (2013); Saleem and Rehman (2011); Gill and Mathur (2011); Aloy (2012). The result is contrary to Raheman and Nasr (2007) who negative impact of liquidity on profitability and to Ben-Naceur and Omran (2008) who empirically verified that NPL has negative effect on the profitability measured by ROE.

The results of the study reveal that the commercial banks in Nepal in terms of NPL, CDR, CRR, BR and CAR have sound credit risk management procedures. The aggregate outcome demonstrated that credit risk management is a significant factor affecting the bank's profitability, suggesting that credit risk management is essential to a bank's profitability performance.

5.2 Conclusion

The study aimed to analyze credit risk management and profitability position of Nepalese commercial banks through credit risk indicators i.e. NPL, CDR, CRR, CAR, and BR. SANIMA has the lowest NPL which is below 1% all over the fiscal years which indicates the bank's assets are doing well. Regarding CAR, all commercial banks have maintained the minimum CAR in all fiscal years as per NRB directives and required cash reserve ratio in all fiscal years. ADBL has CDR above the ideal credit deposit ratio indicating poor credit management in comparison to other commercial banks. SBL has the lowest fluctuation on ROA and ROE among other bank indicating stable profitability of the bank.

The study also has aimed to examine the impact of credit risk management on profitability of Nepalese commercial banks. In order to achieve the objective, the study has considered ROA and ROE as dependent variables, and NPL, CDR, CRR, CAR and BR as independent variables. Non-performing loan has the negative and insignificant impact on profitability when measured by ROA and positive but insignificant impact when measured by ROE. The results also report a negative and significant association between credit deposit ratio and profitability (ROA and ROE), demonstrating an increase in profitability due to a decrease in credit deposit ratio and vice versa. The study has determined capital adequacy ratio have significant positive impact on profitability if ROA is used as a proxy for profitability and significant positive impact on profitability if ROE is used as a proxy for profitability which has been supported by most of the empirical studies.

5.3 Implications

As an essential component of the loan application process, credit risk management is crucial for banks. Maintaining exposure to credit risk helps to protect the bank from the negative consequences of credit risk, hence optimizing bank risk and adjusted risk rate of return. So, it is necessary to study the credit risk management of commercial banks and examine its impact on profitability. The study has observed NPL, CDR, CRR, CAR and BR for measuring credit risk management, and ROA and ROE for measuring the profitability of the banks over different ten fiscal years. Based on major findings, discussions, summary and conclusions drawn from the study, the study has several significant implications on various fields.

Effective credit risk management is the desire of every financial institution. The study has observed the credit risk management of nine commercial banks. These commercial banks may improve their performance on credit risk management more efficiently on the following days understanding how these banks and other banks are managing the credit risks which may be fruitful in taking corrective actions if any deviation is found on the past performance regarding with management of credit risk. Furthermore, the study has observed the impact of credit risk management on profitability of the sample banks to ensure that the credit risk management affects the profitability.

Nepal Rastra Bank (NRB), as a policy maker for the commercial banks and other financial institutions, has made provisions on maintaining the credit risk through its directives. Cash reserve ratio (CRR), capital adequacy ratio (CAR) and other monetary instruments are controlled by NRB. These instruments affect the credit risk management of the commercial banks because the commercial banks should abide by the unified directives of NRB. Thus, the study may provide proper homework for NRB to review its directives time-to-time according to the requirement of the economic situation of the country and workout on formulating more effective policies on credit risk management on upcoming days.

The investors, creditors, bankers, shareholders, depositor and all general public who are interested on this current affair of banking industry can understand the credit risk management, and the relationship between the credit risk management and profitability which help the stakeholders make the investment decisions. The profit is the concern of every investor, and the firm managing the credit risk effectively will be the centre of attraction. The efficient credit risk management provides the past, present and future ability of commercial banks.

The future researchers who have interest on the credit risk management area can conduct their research reviewing the study. The study would be important as it provide theoretical as well as conceptual framework of different aspect of credit risk management and its impact on profitability. The researcher can view other indicators of credit risk management. Except the indicators involved in the research, other measures can also indicate the profitability and credit risk management. Therefore, if could be more interesting to include more indicators to test the relationship. The study has focused on credit risk management and profitability of commercial banks, and was based on nine commercial banks while there are many other development banks as well as microfinance. In addition, credit risk management is not only the factor affecting the profitability of commercial banks. Liquidity, dividend policy, working capital, and other financial performance aspects can also be the matter of concerns. Exploring the other aspects of profitability is also an interesting expansion for this research.

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APPENDICES

Appendix 1

Financial Indicators of Commercial Banks

नबिल बैंक लिमिटेड

Particulars	Indica-tors	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Non Performing Loans/Total Loans	%	2.23	1.82	1.14	0.8	0.55	0.74	0.98	0.84	1.62
Total Credit/Deposit	%	74.55	64.43	70.49	65.38	82.66	81.96	79.72	89.84	92.49
Liquidity (CRR)	%	11.32	14.15	6.77	10.02	10.05	4.78	11.2	3.61	4.13
Total Capital Fund (CAR)	%	11.24	11.57	11.73	12.9	13	12.5	13.07	12.77	13.09
Base Rate	%	5.67	5.78	4.17	6.61	7.78	8.09	7.32	5.86	8.77
Return on Assets	%	2.89	2.06	2.32	2.69	2.61	2.11	1.58	1.71	1.2
Return on Equity	%	27.97	22.73	25.61	22.41	20.94	17.17	13.61	15.19	9.78

Source. Annual Report of Nabil Bank Limited, 2021/22.

standard chartered स्ट्याण्डर्ड चार्टर्ड

Particulars	Indica-tors	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Non Performing Loans/Total Loans	%	0.48	0.34	0.32	0.19	0.18	0.15	0.44	0.96	1.09
Total Credit/Deposit	%	56.87	48.92	56.88	62.2	66.45	70.11	56.75	71.27	73.45
Liquidity (CRR)	%	21.18	24.03	7.98	19.71	18.91	7.52	14.49	7.53	4.44
Total Capital Fund (CAR)	%	12.27	13.1	16.38	21.08	22.99	19.69	18.51	17.17	20.54
Base Rate	%	5.18	4.92	4.47	6.47	7.87	7.63	7	5.51	5.67
Return on Assets	%	2.51	1.99	1.98	1.84	2.61	2.61	1.71	1.22	1.14
Return on Equity	%	26.27	21.69	17.18	11.98	18.66	19.49	15.15	9.44	8.43

Source. Annual Report of Standard Chartered Bank Limited, 2021/22.

Particulars	Indicators	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Non Performing Loans/Total Loans	%	0.017	0.07	0.019	0.01	0.03	0.08	0.45	0.12	0.33
Total Credit/Deposit	%	82.9	83.97	88.1	89.03	87.45	90.42	85.1	94.1	89.18
Liquidity (CRR)	%	26.68	22.32	24.24	26.08	24.72	22.87	24.01	22.15	27.07
Total Capital Fund (CAR)	%	12.54	11.08	12.36	15.57	12.41	13.91	13	13.57	13.66
Base Rate	%	8.22	7.5	6.07	10.2	9.91	9.45	8.62	6.34	9.71
Return on Assets	%	1.46	1.55	1.78	1.86	1.85	2.07	1.41	1.44	1.09
Return on Equity	%	15.09	18.19	22.69	14.39	18.67	23.2	16.09	18.57	14.13

Source. Annual Report of Sanima Bank Limited, 2021/22.

Particulars	Indicators	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Non Performing Loans/Total Loans	%	2.75	1.8	1.47	1.3	1.09	0.75	1.38	1.00	1.07
Total Credit/Deposit	%	79.02	83.03	87.02	88.4	86.08	89.65	89.04	90.6	96.08
Liquidity (CRR)	%	17.22	8.63	6	8.68	6.38	4.56	5.03	3.54	3.23
Total Capital Fund (CAR)	%	11.39	11.1	11.25	12.74	12.12	12.7	13.17	13.36	13
Base Rate	%	8.81	7.87	6.65	10.38	11.16	10.57	9.03	7.16	9.45
Return on Assets	%	1.74	1.51	1.69	1.53	1.59	1.49	1.26	1.25	1.1
Return on Equity	%	34.77	31.87	28.26	26.76	23.62	25.4	21.9	26.04	23.17

Source. Annual Report of Siddhartha Bank Limited, 2021/22.

Particulars	Indicators	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Non Performing Loans/Total Loans	%	0.97	0.66	0.38	0.25	0.2	0.16	0.22	0.12	0.12
Total Credit/Deposit	%	78.01	66.63	73.52	84.05	81.86	87.01	83.52	85.3	90.77
Liquidity (CRR)	%	16.91	24.27	16.61	16.52	17.75	18.56	14.43	18.15	6.59
Total Capital Fund (CAR)	%	11.31	13.33	12.66	14.54	14.2	13.74	13.38	12.48	11.89
Base Rate	%	6.4	6.14	6.14	7.68	8.45	8.12	6.05	5.99	8.82
Return on Assets	%	2.25	1.85	1.85	1.83	1.97	1.94	1.42	0.89	1.13
Return on Equity	%	72.5	57.4	37.56	25.94	31.85	37.67	29.57	19.82	26.19

Source. Annual Report of Everest Bank Limited, 2021/22.

Particulars	Indica-tors	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Non Performing Loans/Total Loans	%	2.55	2.23	1.89	1.6	0.77	0.55	0.43	0.33	0.17
Total Credit/Deposit	%	82.27	83.47	81.47	79.3	96.34	94.79	87.25	91.7	97.92
Liquidity (CRR)	%	31.11	30.12	35.14	33.54	25.34	27.29	30.37	35.67	28.91
Total Capital Fund (CAR)	%	12.38	12.69	12.35	11.37	13.15	14.16	14.16	14.3	14.88
Base Rate	%	10.37	9.52	8.55	7.63	9.83	7.44	8.71	9.98	10.67
Return on Assets	%	1.62	1.39	1.58	1.75	1.65	1.31	1.33	1.88	1.05
Return on Equity	%	19.82	15.56	19.33	22.57	23.64	26.76	15.32	17.75	20.84

Source. Annual Report of Global IME Bank Limited, 2021/22.

Particulars	Indica-tors	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Non Performing Loans/Total Loans	%	5.46	5.35	4.36	4.6	3.5	3.29	2.84	1.88	2.09
Total Credit/Deposit	%	94.80	93.77	95.46	92.90	95.64	93.62	85.84	92.93	107.01
Liquidity (CRR)	%	30.43	28.74	23.33	31.18	29.15	27.20	33.98	36.21	25.96
Total Capital Fund (CAR)	%	14.93	13.90	17.16	20.41	20.33	20.37	19.29	16.94	15.59
Base Rate	%	6.24	6.97	7.15	11.27	11.73	10.58	9.26	7.13	8.90
Return on Assets	%	1.76	0.93	0.58	2.15	2.71	2.77	1.86	1.59	0.90
Return on Equity	%	24.14	25.19	20.00	18.08	23.76	24.25	18.27	19.37	10.53

Source. Annual Report of Agricultural Development Bank Limited, 2021/22.

Particulars	Indica-tors	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Non Performing Loans/Total Loans	%	2.75	1.93	0.91	1.87	1.50	1.00	1.40	0.96	1.10
Total Credit/Deposit	%	80.30	80.43	81.98	81.93	88.02	89.42	88.69	91.54	90.98
Liquidity (CRR)	%	13.00	17.92	12.95	22.35	12.07	8.88	3.78	3.72	3.78
Total Capital Fund (CAR)	%	11.51	11.29	11.92	10.71	11.18	14.30	13.84	13.75	12.44
Base Rate	%	9.85	8.18	7.44	9.32	11.92	10.23	9.03	7.57	9.57
Return on Assets	%	1.46	1.14	2.03	0.59	1.83	1.15	1.14	0.99	1.00
Return on Equity	%	24.13	14.76	30.06	21.36	28.67	28.05	11.85	14.16	15.00

Source. Annual Report of Kumari Bank Limited, 2021/22.

Particulars	Indica-tors	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Non Performing Loans/Total Loans	%	2.23	1.83	1.23	0.88	0.85	1.00	1.48	0.99	1.77
Total Credit/Deposit	%	69.10	81.63	85.00	89.12	87.53	89.15	88.97	89.23	93.65
Liquidity (CRR)	%	11.11	10.83	10.97	13.27	11.42	9.83	7.25	7.18	5.50
Total Capital Fund (CAR)	%	13.82	12.16	11.60	13.28	12.24	12.76	13.84	14.82	13.12
Base Rate	%	10.08	7.62	6.93	10.64	10.47	10.03	8.62	7.21	9.99
Return on Assets	%	1.61	1.63	2.05	1.89	1.82	2.15	1.48	1.72	1.33
Return on Equity	%	14.78	20.66	24.46	18.27	21.46	23.56	16.06	20.32	14.94

Source. Annual Report of Prime Commercial Bank Limited, 2021/22.

Appendix 2

Regression relationship of ROA with NPL, CDR, CRR, CAR and BR

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.869514064
R Square	0.756054708
Adjusted R Square	0.359180904
Standard Error	0.259289442
Observations	81

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	5	4.227081979	0.845416396	4.007723412	0.002817505
Residual	75	15.82100938	0.210946792		
Total	5	4.227081979			

COEFFICIENTS

	Coefficients	Standard Error	t Stat	P-value
Intercept	2.783391043	0.510384	5.453520	0.000001
NPL	-0.010019482	0.046409	-0.090723	0.927955
CDR	-0.474748500	0.005893	-3.735333	0.000363
CRR	0.065649191	0.005551	0.607960	0.545051
CAR	0.144980695	0.019848	2.355147	0.037944
BR	0.133583220	0.034094	1.081820	0.282799

Appendix 3

Regression relationship of ROE with NPL, CDR, CRR, CAR and BR

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.763649109
R Square	0.583159962
Adjusted R Square	0.303920770
Standard Error	0.967630246
Observations	81

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	5	841.4472	168.2894405	2.088388658	0.007614462
Residual	75	6043.754	80.58339137		
Total	80	6885.202			

COEFFICIENTS

	Coefficients	Standard Error	t Stat	P-value
Intercept	4.730622554	0.107514	4.742252	0.000010
NPL	0.056152931	0.115797	0.484926	0.629142
CDR	-0.109730715	0.134044	-2.018614	0.041560
CRR	0.107324411	0.113886	0.942387	0.349020
CAR	-0.328048948	0.112834	-2.907369	0.004791
BR	-0.092629604	0.130230	-0.711277	0.479119

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