# CREDIT MANAGEMENT AND ITS IMPACT ON PROFITABILITY OF NEPALESE DEVELOPMENT BANKS

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

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## CERTIFICATION OF AUTHORSHIP

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

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

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## REPORT OF RESEARCH COMMITTEE

Ms. Dil Kumari Gurung has defended research proposal entitled **"Credit Management and Its Impact on Profitability of Nepalese Development 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 Indra Bahadur Bohara and submit the thesis for evaluation and viva voce examination.

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## APPROVAL SHEET

We, the undersigned, have examined the dissertation entitled **"Credit Management and Its Impact on Profitability of Nepalese Development Banks"** presented by Dil Kumari Gurung a candidate for the degree of master of Business Studies (MBS Semester) and conducted the Viva voce examination of the candidate. We hereby certify that the dissertation is worthy of acceptance.

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

I have great satisfaction and pleasure to express my appreciation and sincerity to my dissertation supervisor Indra Bahadur Bohara of Shanker Dev Campus, TU for his excellent and effective guidance and supervision. I will remain thankful for his valuable direction useful suggestion and comments during the course of preparing this dissertation without his help this work would not have come in this form. I also would like to extend my debt of gratitude Asso. Prof. Dr. Sajeeb Kumar Shrestha, Head of Research Department and I owe a deep debt of gratitude to Asso. Prof. Dr. Krishna Prasad Acharya, Campus Chief of Shanker Dev Campus who provided me an opportunity to undertake this research work.

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Dil Kumari Gurung
Date: ……

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## ABBREVIATIONS

| | | |
|---|---|---|
| CDR | : | Credit to Deposit Ratio |
| CRR | : | Cash Reserve Ratio |
| INF | : | Inflation Rate |
| IT | : | Information Technology |
| JBBL | : | Jyoti Bikas Bank Limited |
| JVBs | : | Joint Venture Banks |
| KSBBL | : | Kamana Sesa Bikas Bank Limited |
| LEV | : | Leverage Ratio |
| LSIZE | : | Log of Total Assets |
| Ltd. | : | Limited |
| MNBBL | : | Muktinath Bikas Bank Limited |
| NPLR | : | Non – performing Loan Ratio |
| NRB | : | Nepal Rastra Bank |
| ROA | : | Return on Assets |
| ROE | : | Return on Equity |
| SADBL | : | Shangri-La Development Bank Limited |
| SD | : | Standard Deviation |
| SIZE | : | Bank Size or Total Assets of Banks |
| TA | : | Total Assets |
| TU | : | Tribhuvan University |

## ABSTRACT

This study examines the impact of credit management on the profitability of Nepalese development banks. Secondary data was collected from these banks over a ten-year period (2012/13–2021/22). The data was analyzed using correlation and multiple regression analysis. The study finds that Nepalese development banks exhibit low credit risk, as indicated by a low non-performing loan ratio, and they maintain a strong profitability position. The correlation test indicates that the cash reserve ratio has an insignificant positive relationship with profitability. The credit-to-deposit ratio shows an insignificant negative relationship with Return on Assets (ROA) and an insignificant positive association with Return on Equity (ROE). In contrast, non-performing loans and bank size have a significant negative relationship with profitability. Additionally, the leverage ratio has a significant negative relationship with ROA but an insignificant positive relationship with ROE. The regression analysis confirms that both the cash reserve ratio and the credit-to-deposit ratio have an insignificant positive effect on profitability (ROA and ROE). However, non-performing loan ratio and bank size significantly negatively impact profitability. Lastly, the leverage ratio has an insignificant negative impact on ROA but a significant positive impact on ROE. Thus, the study concludes that credit risk has a significant negative impact on the profitability of Nepalese development banks.



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

# CHAPTER - I

# INTRODUCTION

## 1.1 Background of the Study

Credit risk is the main possibility that improvement banks oversee, and for them to function effectively, it should be regularly reviewed and regulated (Shrestha, 1998). Credit risk the board is significantly regarded and has a lot of room to fill in the monetary region. Improvement banks and other money related associations much of the time face takes a risk with that are by and large of a financial sort. The most common way of controlling an organization's credit risk openings in a manner that extraordinarily decreases the likelihood that such exercises would unfavorably affect an improvement bank's capital and productivity is known as viable credit risk the board. Credit chance may be available in an improvement bank's different resources and tasks notwithstanding its advance portfolio. Comparative gamble may likewise be available in the wobbly sheet and on-monetary record records of an improvement bank.

Credit risk has drawn in the consideration of scholastics and industry specialists since it stays a significant concern in the monetary framework, particularly following the new worldwide financial emergency (GFC). Credit risk is the likelihood that one of the gatherings to an agreement won't complete its half of the understanding. It is otherwise called counterparty risk, default hazard, or execution risk. At the point when improvement banks loan cash to their clients and those credits are not returned, there is a gamble of monetary misfortune. Improvement banks defy a lot of chance because of the idea of their business, and overseeing credit risk really means quite a bit to their monetary exhibition than dealing with some other sort of hazard (Horcher, 2005).

Bhattarai (2016) describes recognize risk similarly as the open door that an obligation holder won't pay the head or possibly interest on a momentous credit. As was as of late said, advance income fills in as both the improvement banks' fundamental sort of income and credit risk. Exactly when borrowers take out progresses from progress banks, the banks guess that their clients ought to repay the head and premium

aggregate on time. Then again, credits that are performing are those where the standard and interest are dealt with according to the conditions and on time (Kolapo et al., 2012).

For improvement banks to find actual success for a really long time, risk the executives is basic to decreasing gamble and forestalling money related and monetary issues. As well as further developing advancement banks' productivity and practicality, great credit risk the board likewise helps the economy's foundational solidness and proficient capital designation. Since it is a vital part of the credit application process, improvement banks put a lot of significance on this. ID, estimation, observing, and control of credit risk coming about because of potential advance installment defaults are undeniably remembered for credit risk the executives. Regardless of whether the advancement banks are uncertain of the level of borrowers who are probably going to default, this vulnerability likewise adds to the distinctions in benefit among the improvement banks. The essential objective of credit risk the board is to upgrade improvement banks' return, adapted to risk, while keeping a sensible level of openness (Ndoka & Islami, 2016).

As a rule, senior administration is responsible for creating strategies and methodology for credit organization, getting bored endorsement prior to completing them (Ndoka & Islami, 2016). In an ideal world, top administration would ensure that all workers knew about the principles and cycles relating to the credit endorsement process at all levels of the ordered progression (Ndoka & Islami, 2016). Moreover, an inner gamble control and review that watches out for credit discipline, advance arrangements, endorsement systems, portfolio level gamble, and office risk openness checks that successful credit risk the executives has been carried out (Gestel & Baesens, 2009). Thusly, for powerful administration of credit dangers to improve benefit and its endurance, a solid system for credit risk the board is fundamental.

In conclusion, a country's monetary framework fundamentally affects the administration of credit risk for improvement banks. Compelling credit risk the executives helps improvement banks capability monetarily by forestalling serious issues. Solid monetary outcomes give investors a profit from their venture. Financial development will follow and promote venture will be supported subsequently. Then

again, low bank productivity could bring about emergencies and bank disappointment, which could hurt financial development.

Development banks are significant for a country's progression and headway. Maybe of the most essential work in an association that aides in diminishing the serious effects of credit bets is credit the leaders. Credit risk is crucial for an association's turn of events and advantage, particularly for money related foundations. As seen by the rising insignificant incidents that result from borrower default, credit risk remains an issue even with the monster attempts made by progression banks. Improvement banks experience various difficulties, but credit risk the board whether directly or by suggestion is the foremost promoter. By confining bet openings to solid levels, credit risk the board means to help a component's bet changed speed of return. It is required from progress banks to manage both the bet related with individual credits or trades and the credit risk natural in the overall portfolio. Of course, notwithstanding different things, there have been grumblings over powerlessness to fulfill commitments, lacking oversight, and an elevated degree of defaulters. To recognize a technique for extending business efficiency through capable credit the board methodology, it is critical to look at what different pieces of credit risk the leaders mean to support money related information.

Giving the senior management credit is essential for a company's growth and productivity, especially when it comes to its financial foundations. The way that the collateral losses that business banks experience when borrowers fail illustrates how credit risk persists despite their best efforts. While banks manage various issues, credit risk the board whether straightforwardly or by implication is the fundamental patron. By restricting gamble openings to healthy levels, credit risk the executives intends to boost a substance's gamble changed pace of return. It is expected of banks to oversee both the gamble related with individual credits or exchanges and the credit risk innate in the general portfolio. Then again, in addition to other things, there have been complaints over inability to satisfy obligations, lacking oversight, and a high level of defaulters. Consequently need to analyze what different parts of credit risk the board means for benefit of monetary data with perspective on tracking down answer for upgrading firm productivity through viable credit risk the executives rehearses.

That is the reason, this concentrate consequently looks to examine the credit the executives and its effect on benefit of improvement banks in Nepal.

### 1.2 Problem Statement

Non-performing credits, or NPLs, have been a huge figure the countries that have been confronting a financial emergency, alongside other macroeconomic pointers. Global Financial Asset (IMF) research demonstrates that indications of a financial emergency become more serious while non-performing credit (NPL) proportions the level of NPLs to all credits ascend north of seven percent. The benefit and supportability of a bank are harmed by non-performing credits (NPLs) because of the way that the advance misfortune arrangement expected to cover NPL misfortunes decreases the capital accessible for new credit issuance. A critical expansion in NPL over the long run likewise recommends a more hazardous BFI resource portfolio that limits extension and liquidity. Dubious about the current situation with non-performing advances (NPLs) in Nepali banks, the IMF intends to lead a worldwide assessment. Presently, the normal non-performing credit of 20 business banks is 2.80 percent toward the finish of Asad 2080 (NRB, 2023).

Otieno and Nyagol (2016) found that the bank's credit risk the executives framework's deficiencies in controlling advance quality were the repetitive figure the disappointments. Annor and Obeng (2017) demonstrated that there was, as a matter of fact, a significant connection between bank profitability and credit risk the board. A bank's profitability was decidedly corresponded with its capital sufficiency proportion; in any case, there was a genuinely critical negative connection between a bank's benefit and its credit to resource proportion, non-performing advance proportion, and credit misfortune arrangements proportion.

Al-Eitan and Bani-Khalid (2019) found that CR had a negative and significant connection with profitability. Munangi and Sibindi (2020) tracked down a negative connection between monetary exhibition and size. Nelson (2020) stated that both the non-performing credit proportion and the credit misfortune arrangement proportion adversely affect ROE.

Biswas et al. (2021) found a significant positive correlation between return on assets (ROA) and the capital adequacy ratio (CAR), while there was a notable negative correlation between ROA and both non-performing loans (NPL) and bank size. However, the cash reserve ratio did not show a significant relationship with ROA. In a similar vein, Yeasin (2022) discovered that the loan-to-deposit ratio (LDR) positively and significantly affected profitability, while non-performing loans (NPL) and capital adequacy ratio (CAR) adversely impacted the financial performance of commercial banks.

Bhattarai (2016) found that the ratio of non-performing loans negatively affects bank performance, while bank size has a positive impact on performance. Maharjan et al. (2016) reported that the loan-to-deposit ratio significantly benefits profitability, whereas the ratio of non-performing loans to gross loans negatively impacts it. Shrestha (2017) observed a positive relationship between the cost per loan asset and return on profitability. Poudel (2018) found that inflation and credit risk significantly affect the profitability of Nepalese commercial banks. In contrast, the capital adequacy ratio and total assets greatly enhance their profitability. Vongbusin (2019) showed that return on assets (ROA) had a negative relationship with the capital adequacy ratio, leverage ratio, non-performing loan ratio, and loan loss provision ratio. Conversely, there was a positive correlation between ROA and the interest earned from credit facilities.

Risal and Poudel (2020) found that credit risk negatively affects bank profitability. Shrestha and Nirouala (2021) concluded that both credit deposit ratio (CDR) and non-performing loan ratio (NPLR) significantly decrease return on assets (ROA), whereas the capital adequacy ratio (CAR) and interest rate spread (IRS) positively impact ROA. Kawor and Atinyo (2022) discovered that the ratios of non-performing loans to loan assets (NP/LA) and loans to total deposits (LA/TD) significantly enhance ROA, while the provision for loan losses to non-performing loans (PLL/NL) has a negative effect. Shrestha (2022) observed that the ratio of total loans to total deposits (TL/TD) has a major positive influence on the profitability of Nepalese commercial banks, while the ratios of non-performing loans to total loans (NPL/TL) and loan loss provisions to total loans (LLP/TL) have a negative impact. Given these conflicting findings and the lack of research on development banks, the current study aims to

explore credit management and its effect on the profitability of development banks in Nepal. The study is guided by the following research question.

- What is the current status of credit risk and profitability of Nepalese development banks?
- What is the relationship between credit risk and profitability of Nepalese development banks?
- What is the impact of credit risk on profitability of Nepalese development banks?

### 1.3 Objectives of the Study

The main objective of the research is to investigate the credit management and its impact on profitability of Nepalese development banks. The other specific objectives are;

- To assess the current status of credit risk and profitability of Nepalese development banks.
- To examine the relationship between credit risk and profitability of Nepalese development banks.
- To analyze the impact of credit risk on profitability of Nepalese development banks.

### 1.4 Hypothesis of the Study

Based on the information discussed earlier, it is clear that examining the relationship between credit risk management and profitability in Nepalese development banks is of significant interest.

**$H_1$:** Cash reserve ratio has no significant impact on profitability of Nepalese development banks.

**$H_2$:** Loan to deposit ratio has no significant impact on profitability of Nepalese development banks.

**$H_3$:** Non-performing loan to loan has no significant impact on profitability of Nepalese development banks.

**$H_4$:** Leverage ratio has no significant impact on profitability of Nepalese development banks.

**$H_5$:** Bank size has no significant impact on profitability of Nepalese development banks.

### 1.5 Rationale of the Study

This research study provides future researchers with a standardized and coordinated approach for disseminating their work. The implications of the study include the following:

- It assists shareholders, depositors, and other creditors in assessing the effectiveness of their investments in development banks, and it also attracts the interest of other financial institutions and specialists concerned with the banks' success.
- The study helps bank management evaluate the effectiveness of their credit policies and management practices in comparison to those of their competitors.
- Given that non-performing assets are considered a major issue for development banks due to certain deficiencies, the research is also crucial for the central bank's efforts to develop new lending policies.

### 1.6 Limitations of the Study

The study has several limitations. The primary limitations are as follows:

- The study includes only four development banks: Shangri-La Development Bank Limited, Jyoti Bikas Bank Limited, Muktinath Bikas Bank Limited, and Kamana Sewa Bikas Bank Limited.
- The focus of the study is only on credit risk management and profitability, excluding other financial aspects.
- The data analyzed covers a ten-year period, from fiscal year 2012/13 to fiscal year 2021/22.
- The study relies on secondary data sourced from the annual reports of the respective development banks, NRB reports, and other relevant websites.

# CHAPTER - II

# LITERATURE REVIEW

This chapter compiles existing literature on the study's topic, focusing on credit theories and empirical research related to credit risk. It highlights gaps in the current body of knowledge, providing a context for the study's contributions.

## 2.1 Theoretical Review

### 2.1.1 Concept of Credit Risk

The primary role of development banks is to collect deposits from various sources and provide loans to industries such as commerce, manufacturing, transportation, construction, communication, and other public utilities. These operations inherently involve significant risk. Among the various risks faced by the banking sector, credit risk is particularly notable. It refers to the potential financial loss a bank may incur if borrowers fail to repay loans or meet contractual obligations in full.

Market risk includes trading risk and balance sheet risk, which involves potential threats to capital and earnings from fluctuations in foreign exchange rates, liquidity constraints, and interest rate changes. Operational risk arises from system failures, fraud, forgery, errors in transaction processing and settlement, asset protection issues, and natural disasters. Credit risk specifically refers to the likelihood that borrowers will not meet their obligations as per the established terms. It includes exposures from both lending activities and off-balance-sheet or interbank activities. Credit risk management (CRM) aims to optimize the bank’s risk-adjusted rate of return by keeping credit risk exposure within acceptable limits. While loans are a major and often unrecognized source of credit risk, additional credit risk can also be present in various aspects of a bank’s operations, including its trading and banking books and on and off-balance-sheet activities (Michel et al., 2001).

In addition to loans, banks are increasingly exposed to credit risk in other financial instruments, including acceptances, interbank transactions, trade financing, foreign exchange transactions, guarantees, and transaction settlements. Credit is considered a high-revenue asset, especially for development banks. Since credit constitutes a

significant portion of transactions, it is regarded as central to the development bank's operations. It represents a major portion of investments and plays a crucial role in generating profits and determining overall profitability. Additionally, it has a significant impact on the broader economy (Horcher, 2005).

In the current scenario, credit not only affects individual clients but also has broader implications for the national economy. When banks extend credit to businesses, it enhances the financial standing of those businesses, provides liquidity to various industries and trades, and contributes to government revenue through taxes. This, in turn, supports overall economic growth and offers protection for depositors.

Credit is fundamental to wealth maximization, and while other factors also influence profitability and wealth, credit risk is considered the most critical. It is central to development banking and represents one of the most challenging aspects of the sector. Therefore, effective credit management is essential. Credit risk management involves overseeing credit exposure from loans, corporate entities, and credit derivatives to ensure successful management and mitigate potential losses. For development banks, credit exposures are primary investment sources, and the profits generated from these investments are crucial for their income (Nwankwo, 1991).

### 2.1.2 Types of Credit Risk

Several authors have outlined various criteria for classifying credit risk. For example, credit risk can be divided into three categories: firm or corporate, sovereign or government, and personal or consumer hazards. Default risk and resale risk are also included in this category.

The views presented here are in partial agreement with those of Horcher (2005), who enumerates six additional categories of credit risk: concentration, country or sovereign, litigation, counterparty pre-settlement, default, and counterparty settlement. According to Mckinley and Barrickman (1994), there are other elements of credit risk such as transaction risk, intrinsic risk, and concentration risk.

1. Transaction Risk: Transaction risk in the context of credit risk management encompasses various aspects of the loan process. Here’s a detailed look at how each

area contributes to transaction risk and its impact on credit quality and profitability (Mckinley & Barrickman, 1994).

2. Intrinsic Risk: It focuses on the risk involved in lending money to specific companies and sectors of the economy. By their very nature, loans for the construction of commercial real estate carry greater risk than those for consumers. Intrinsic risk is the susceptibility to lending, historical, and forecast risk factors that define a company or industry. The historical components cover the performance and stability of the business or industry in the past. Predictive components concentrate on traits that are subject to change and may have a positive or negative effect on future performance. Fundamental lending principles focus on how the terms and collateral available within the industry or business area affect the inherent risk (Mckinley & Barrickman, 1994).

3. Concentration Risk: The formation of transaction and inherent risk within the portfolio is known as concentration risk, and it might result from loans to a single borrower or from loans to a certain industry, geographic area, or business sector. The bank must specify acceptable portfolio concentrations for each of these aggregations. Diversification of the portfolio achieves a major objective. It allows a bank to avoid disaster. The portfolio's concentrations will determine how much problems a bank has in adverse situations (Mckinley & Barrickman, 1994).

### 2.1.3 General Principles of Sound Credit Risk in Banking

Credit risk can be simply described as the chance that a borrower or counterparty might fail to meet their obligations as per the agreed terms (Adams & Mehran, 2004). To maximize a bank's risk-adjusted return, credit risk management aims to keep exposure within a reasonable limit, typically no more than a five percent default rate. This involves not only managing risks associated with individual loans or transactions but also overseeing the credit risk across the entire portfolio. Banks should also consider the interplay between credit risk and other types of risks. Effective risk management must incorporate strong credit risk management as a core component, as it is crucial for the long-term sustainability of any financial institution. The Basel Committee on Banking Supervision’s 2000 study on credit risk highlighted four key elements essential to any credit management process: establishing a conducive credit

environment, implementing a robust credit-granting procedure, ensuring adequate controls over credit risk, and evaluating and maintaining protective covenants.

#### 2.1.3.1 Establishing an Appropriate Credit Risk Environment

A credit risk strategy should clearly outline the types of credit a bank is willing to extend, the target markets, and the desired attributes of its credit portfolio. These strategies must reflect the bank's risk tolerance and the anticipated profitability from various credit risks. A bank's credit risk plan should balance goals related to earnings, growth, and credit quality. Since profit is the primary goal for any bank, it must assess the acceptable risk-return trade-off for its operations, considering the cost of capital. Conversely, credit policies define the bank's approach to managing credit risk and establish the necessary constraints, such as asset classification, pricing terms, and portfolio composition. Developing and adhering to documented rules and processes for identifying, measuring, monitoring, and managing credit risk is essential for sound banking practices. These guidelines should be specific, aligned with prudent banking practices and legal requirements, and appropriate for the bank's nature (Saunders & Cornett, 2007).

Effective communication of credit risk plans and policies is vital throughout the organization. Every relevant employee should be accountable for following established policies and processes and should have a comprehensive understanding of the bank's approach to issuing and managing credit. Additionally, fostering a suitable credit environment involves cultivating a positive credit culture within the bank, where staff possess an implicit awareness of the lending environment and expected conduct.

#### 2.1.3.2 Operating under a Sound Credit Granting Process

According to the Basel Committee (2000), a bank must have a structured process for evaluating transactions and approving credit to maintain a healthy credit portfolio. Approvals should be granted by the appropriate level of management and adhere to the bank's documented policies. Additionally, there must be a clear audit trail that verifies adherence to the approval process, identifying the individuals who made the credit decision and the committees that provided input.

To assess the creditworthiness of borrowers and filter out those who are less favorable, a robust credit-granting procedure requires establishing clear credit criteria and exposure limits. Traditionally, banks have evaluated borrowers' creditworthiness using the "five Cs," which are:

**Character**

This refers to the borrower's personal attributes, including their integrity, willingness, and dedication to repaying debt. Credit is more favorable to borrowers who demonstrate a high level of honesty and a strong commitment to repaying their loans.

**Capital**

This pertains to the borrower’s financial situation. A borrower is considered suitable for a credit facility if they have substantial financial assets that exceed their financial liabilities.

**Capacity**

This also involves the borrower's ability to manage and repay debt based on the success or failure of the project for which the credit is being used. Successful business performance over a reasonable historical period is also considered when granting a loan facility.

**Collateral**

These are assets, typically either immovable or movable, that are provided as security to ensure the fulfillment of a duty. Collateral can include items such as real estate, stocks, and receivables. Borrowers who pledge more valuable assets as collateral are generally more attractive for lending facilities.

**Condition**

This refers to the economic conditions at the time the loan application is made. During recessions, it can be particularly challenging for borrowers to obtain credit. Banks need to develop a team of credit risk officers with the necessary training, expertise, and background to carefully evaluate, approve, and manage credit risks.

#### 2.1.3.3 Maintaining Credit Admin, Measurement and Monitoring Process

Credit management is crucial for maintaining a bank's security and soundness. Once credit is issued, the bank must ensure it is properly managed. This involves updating credit files, obtaining current financial data, notifying relevant parties, and preparing various documents such as loan agreements, inspection reports, and follow-up reports. Effective credit administration helps create and sustain a secure credit environment and generally protects the institution from lending violations, making it vital to the bank's overall performance (Horcher, 2005).

#### 2.1.3.4 Ensuring Adequate Controls over Credit Risk

To ensure proper controls over credit, each officer responsible for issuing credit must have set credit limits. Significant transactions involving related parties must be approved by the board of directors, and in some cases, these transactions should be reported to banking regulatory authorities. Implementing various types of credit reviews is a strategy to ensure that banks maintain adequate control over credit risk. Regular credit reviews help confirm that policies and credit decisions are aligned, and they provide an impartial evaluation of asset attributes (Mckinley & Barrickman, 1994).

### 2.1.4 Theories of Credit Risk

Although various banks may employ different specific methods, reviewing the general concepts of credit risk management in this section can provide a clearer understanding of how banks handle credit risk. The following are the theories of credit risk management:

#### 2.1.4.1 Commercial Loan Theory

The commercial loan assumption, sometimes referred to as the real bills concept, is the first banking theory. According to this theory, banks should only make self-liquidating, short-term commercial paper loans. The goal of the commercial loan hypothesis, according to Hosna and Manzura (2009), is to have a major influence on bank lending as well as overall economic activity. Adhering strictly to this idea means that banks ought to function as sources of funding that adjust to shifts in the economy as a whole. Nigerian bankers think it is wise to use depositors' money for short-term

loans because of the quick return on these funds, so it is evident that the country's Deposit-Money Banks (DMBs) share this mindset.

Kargi (2011) notes that the theory's strong connections appear to be fairly conventional, especially in light of the fact that it was developed at a time when secondary reserve assets were either nonexistent or extremely scarce, potentially acting as a safeguard against bank liquidity problems. Nevertheless, this theory does not deal with Nigeria's developing economy's credit needs. It hasn't made banks more willing to lend money to people buying houses, vehicles, equipment, or plants. The theory ignores the relative stability of bank deposits by insisting that all loans be repaid in the regular course of business. Demand deposits are paid on demand, though it's unlikely that all depositors will make demands at the same time. Because deposits are stable, a bank can extend funds for a reasonable amount of time without running the risk of illiquidity. The real bills doctrine, also known as the commercial loan theory, has been a widely recognized banking theory despite its shortcomings. It continues to have an impact on the way banks assess themselves, the regulatory bodies that oversee banks, and the mindset of many bankers. Knowledge of financial history is necessary to comprehend modern banking, and understanding commercial loan theory is also necessary.

#### 2.1.4.2 The Shiftability Theory

According to this theory, assets can also include other movable open-market assets, such as government securities, rather than just self-liquidating bills (Moti, Masinde & Mugenda, 2012). It is important to remember that the commercial loan theory was neither superseded nor rendered invalid by the shiftability thesis. Rather, by extending the range of assets acceptable for bank ownership, it provided a more comprehensive view of the banking industry. The shiftability theory says that there are other acceptable assets besides commercial loans, not that they are bad assets for banks. The shiftability theory's central tenet is that a bank's capacity to sell its assets to a third party for a predetermined price determines how liquid it is. Thus, it makes perfect sense for a bank's asset portfolio to contain short-term open market investments.

Hosna and Manzura (2009) assert that there is no denying the shiftability hypothesis's substantial influence on banking practices. In order to ensure bank liquidity, it essentially moved bankers' and regulators' attention from loans to investments. The theory's proponents contended that the short-term commercial loans' assumed liquidity was essentially untrue. Kargi (2011) notes that, like the commercial loan theory, the shiftability theory had a significant flaw. This flaw, as many authors on the subject have widely acknowledged, had less to do with the theory itself and more to do with the bank management practices it encouraged. The problem was that, although an individual bank could move its assets to generate the required liquidity, this was not practical for the banks as a whole.

#### 2.1.4.3 The Anticipated Income Theory

After doing a lot of research, Prochnow presented the "Anticipated Income Theory," a groundbreaking theory of lending, in 1949. This theory states that banks should liquidate term loans based on the borrower's projected earnings, irrespective of the nature and type of the borrower's business, as per a study conducted by Afriyie and Akotey (2011). This approach derives liquidity from the borrower's projected future income, as opposed to traditional or commercial theories that entail selling the borrower's assets or shiftability theories that entail moving the term loan to another lender. This theory basically says that instead of considering the borrower's current income, banks should consider their future income when deciding whether to grant a loan. This theory, sometimes known as the "cash flow approach" to financing, is characterized by Kolapo, Ayeni, and Oke (2012) as a "future-oriented approach" to bank lending.

Rather than the shiftability hypothesis, this theory's main rival is the commercial loan concept. It does not conflict with the shiftability theory, which maintains that a bank's secondary reserves serve as its primary source of liquidity. Rather, it shifts the focus back to the kinds of loans that banks ought to be permitted to make, reaching different conclusions from those who endorse the theory of commercial lending (Moti, Masinde, & Mugenda, 2012).

#### 2.1.4.4 The Credit Risk Theory

Salas and Saurina (2002) argued that the possibility that a borrower will stop making loan payments and go into default is known as credit risk. This risk, which the lender will ultimately bear, entails the possibility of losing both principal and interest. For instance, there may be a total or partial disruption loss if an insolvent bank is unable to reimburse a depositor for their money. In order to reduce the lender's risk, steps like checking the prospective borrower's credit, requiring the proper insurance, such as mortgage insurance, or obtaining collateral or guarantees from other sources might be taken. In general, debtors will be required to pay a higher interest rate on their loan the higher the risk.

#### 2.1.4.5 The Liability Management Theory

According to this theory, a bank that experiences a reserve shortfall does not need to follow conventional guidelines because it can purchase reserve funds through short-term loans on the money market. This does not mean, however, that the bank just passively manages its assets and obligations (Shafiq & Nasr, 2010). Rather, the theory posits that a bank's liquidity is largely dependent on the asset structure of the bank. The theory, however, only takes into account one aspect of liquidity, implying that a bank may also produce liquidity by using its liabilities. In order to process legitimate loan requests from customers and enable deposit withdrawals, a bank needs liquidity. Even though bank loans can be lucrative, a bank is unlikely to retain its depositors for very long if it fails or declines to lend to them when they are in need.

### 2.1.5 Credit Monitoring and Control

Credit risk monitoring involves the ongoing assessment of both a bank's entire credit portfolio and individual credits, including exposures that are off the balance sheet. Banks need to establish a system for regularly evaluating the quality of their credit portfolio and taking corrective actions if any declines are detected. Such a system enables a bank to verify if loans are being serviced according to the terms of the facility, assess the adequacy of reserves, ensure that management has imposed limits on the overall risk profile, and confirm compliance with regulatory requirements.

With an effective credit monitoring system in place, senior management can track trends and the overall quality of the credit portfolio. This allows management to

adjust or reassess its credit strategy or policy before encountering significant issues. The bank's credit policy should clearly outline the procedures for credit risk monitoring. At a minimum, it should specify:

- The frequency of monitoring
- The periodic review of collateral and loan covenants
- The frequency of site visits
- The roles and responsibilities of those responsible for credit risk monitoring
- The assessment procedures and analysis techniques for both individual loans and the overall portfolio (Gupta, 1984).

a) Financial Position and Business Conditions

The financial condition of an obligor is crucial as it affects their ability to repay loans. Therefore, institutions must closely monitor the debtor's financial status. Key financial performance metrics, such as profitability, equity, leverage, and liquidity, should be thoroughly analyzed. This analysis should also consider business and industry risks, the borrower's position within the sector, and external factors like the economy, legislation, and regulations. When assessing the capability and effectiveness of shareholders and/or management, particularly in companies whose financial health relies heavily on them, including small and medium-sized enterprises, institutions must be particularly diligent (Khan, 1982).

b) Conduct of Accounts

Monitoring a debtor's account activity can provide a reliable indicator of the quality of the credit facility. Institutions need to track account activity, any excesses beyond credit limits, and the repayment history of the borrower. For institutions offering trade financing, it is important to watch for repeated extensions of trust receipts and bill due dates, as these may signal potential issues (Khan, 1982).

c) Loan Covenants

The obligor's compliance with the loan agreement's negative promises and financial covenants should be regularly assessed. Any breaches identified should be promptly addressed and rectified (Khan, 1982).

d) Collateral Valuation

Banks need to periodically reassess the value of collateral to prevent unsecured lending that could result from a decline in value. These valuations are specific to the type of collateral involved. For instance, a loan secured by shares typically requires daily revaluation, while a mortgage on residential property may not need such frequent reassessment. If a credit facility is backed by commodities or inventory located at the debtor's premises, a proper inspection should be conducted to verify both the presence and value of the collateral (Khan, 1982).

Securities acquired as long-term investments or as collateral for loans should have their market price and external ratings closely monitored for significant declines in the issuer's credit rating. Any negative changes should trigger a thorough reassessment of the creditworthiness.

### 2.1.6 Profitability of Development Banks

Development banks face significant pressure to balance the needs of depositors, staff, investors, and borrowing clients while also demonstrating sound lending practices and policy frameworks to government authorities. Like other corporate entities, development banks are driven by profit, with their primary goal being to maximize earnings (Shrestha, 1998).

Development banks invest public deposits in industries that offer the highest income or the best returns on assets. Consequently, their investment decisions and loan approvals are heavily influenced by potential profit margins. A development bank’s profitability is generally determined by its interest rates, the volume of loans issued, the duration of those loans, and its investments in other assets. The pursuit of profit is justified as development banks need to cover overhead costs, including interest payments to depositors and administrative expenses. They also need to distribute dividends to shareholders who have contributed to the bank's capital growth and allocate funds for reserves and provisions. Investments are made after calculating the cost of funds and expected returns, ensuring that the spread, despite associated risks, is sufficient to meet liquidity commitments.

A successful bank effectively allocates most of its capital to revenue-generating assets while also managing liquidity to ensure it can meet depositors' daily needs. Essentially, a development bank is designed to maximize the value of investors' capital while maintaining a reasonable level of risk. In summary, the main objective of Nepalese development banks is to maximize profits, with earnings serving as the key financial indicators of their performance (Shrestha, 2017).

## 2.2 Empirical Review

### 2.2.1 Review of Journals/Articles in International Context

Chandra and Maretha (2024) analyzed the effect of credit risk, liquidity risk, and bank capital on bank profitability during the COVID-19. The study aimed to analyze the impact of credit risk, liquidity risk, and bank capital on the profitability of banks in Indonesia and Malaysia during the Covid-19 economic crisis using panel regression analysis through E-views software. A purposive sampling method was employed, resulting in a research sample of 232 data points from Indonesian banks and 64 data points from Malaysian banks, collected quarterly from 2020 to 2021. The study's findings indicate that bank capital does not influence the profitability of banks in either country. Credit risk negatively affects the profitability of Indonesian banks but does not impact Malaysian banks. Conversely, liquidity risk positively affects the profitability of Indonesian banks, with no effect on Malaysian banks.

Butola, Dube and Jain (2023) investigated impact of credit risk management on the profitability of Indian Banks. This study's main objective was to ascertain the statistical relationship between credit risk management (CRM) and Indian banks' profitability. The study used panel data regression for analysis and secondary data from 38 scheduled commercial banks in India. The credit to deposit ratio (CDR), net interest margin (NIM), operating profits to total assets (OPA), capital adequacy ratio (CAR), provision coverage ratio (PCR), and net non-performing assets to net advances (NNPA) were the independent variables, and return on assets (ROA) was the dependent variable used to measure profitability. The results indicate that ROA correlates positively with CDR, OPA, and CAR but negatively with NIM, NNPA, and PCR, despite the fact that PCR also demonstrates a statistically significant relationship.

Kawor and Atinyo (2022) examined the link between credit risk and profitability of universal banks in Ghana. This study analyzed annual data from 22 selected banks for the years 2011–2020 in order to investigate the relationship between credit risk and the profitability of universal banks in Ghana using criterion sampling. To analyze the relationship, regression using Ordinary Least Squares (OLS) was employed. Profitability was determined by return on assets (ROA); credit risk was determined by loans and advances to total deposits (LA/TD), nonperforming loans to loans and advances (NP/LA), and provision for loan losses to net loans (PLL/NL). The findings showed that while PLL/NL had a negative impact on ROA, NP/LA and LA/TD had significant positive effects. The study's overall findings demonstrated how credit risk affects bank profitability and recommended that Ghanaian universal banks actively manage and lower credit risk.

Yeasin (2022) investigated impact of credit risk management on financial performance: a study of commercial banks in Bangladesh. The study aimed to investigate the impact of credit risk management on the financial performance of commercial banks. Utilizing a deductive research approach, the study focused on six commercial banks in Bangladesh. Secondary data from 2010 to 2019 were analyzed using panel regression techniques. The findings revealed that the Capital Adequacy Ratio (CAR) and Non-performing Loans (NPL) had a statistically significant negative effect on the banks' financial performance. In contrast, the Loan to Deposit Ratio (LDR) had a statistically significant positive effect. Overall, the results indicate that credit risk negatively affects the financial performance of commercial banks.

Dunyoh et al. (2022) examined the impact of credit risk on financial performance: evidence from rural and community banks in Ghana. The study explored the impact of credit risk on the financial performance of community and rural banks in Ghana, using annual reports from 2014 to 2018. Data from ten banks, with accessible financial records for the study period, were analyzed using STATA version 13. The findings showed a negative correlation between the credit risk indicators and financial performance metrics. The study concluded that credit risk negatively affects the financial performance of these banks, has been increasing over time, and is expected to continue rising in the future.

Ayim and Agyemang (2021) examined the effect of credit risk on the profitability of banks listed on the Ghana stock exchange. This study looked into how credit risk affected the banks listed on the Ghana Stock Exchange's (GSE) profitability. A panel data regression model was used in the study to analyze annual data from 8 out of the 9 listed banks. The findings showed that while the Non-Performing Loans Ratio (NPLR), Cash Reserve Ratio (CRR), Asset Growth Ratio (AGR), and Leverage Ratio (LEV) have no effect on profitability, the Capital Adequacy Ratio (CAR) and Cost Per Loan Asset (CPLA) have a significant impact on bank profitability. 49.5% of the variation in profitability was explained by the model. The study suggested that in order to affect bank profitability, the Bank of Ghana (BoG) and other regulators should concentrate on alternative profit indicators besides credit risk. Furthermore, because of their enormous influence, bank management ought to give CAR and CPLA top priority. The impact of operational, market, or liquidity risks on the profitability of banks listed on the GSE should also be investigated in future studies.

Biswas et al. (2021) analyzed effect of credit risk on commercial banks' profitability: a case study of Bangladesh. Utilizing multiple regression analysis and secondary data from annual reports, the study looked at how credit risk affected the profitability of banks that operated in Bangladesh's public and private sectors. It was discovered that there was a statistically significant positive correlation between the Capital Adequacy Ratio (CAR), the Cost to Loan Assets Ratio, and the Return on Assets (ROA). On the other hand, a noteworthy inverse relationship was noted between bank size, ROA, and non-performing loans (NPLs). There was no discernible correlation between ROA and the Cash Reserve Ratio. The study came to the conclusion that the three most important predictors of bank profitability among the five credit risk indicators looked at were bank size, NPLs, and CAR.

Al Zaidanin and Al Zaidanin (2021) investigated the impact of credit risk management on the financial performance of United Arab Emirates commercial banks. Using panel data from 2013 to 2019, this study sought to ascertain the effects of multiple independent factors on the financial performance of sixteen commercial banks in the United Arab Emirates: capital adequacy ratio, non-performing loans ratio, cost-income ratio, liquidity ratio, and loans-to-deposits ratio. Using a random effects model for hypothesis testing, descriptive statistics were used to analyze

secondary data obtained from the banks. The findings showed that the cost-income ratio and non-performing loans considerably lower these banks' profitability. As a result, they are not very good indicators of profitability. In contrast, capital adequacy, liquidity, and loans-to-deposits ratios only marginally positively correlated with Return on Assets (ROA), and their statistical significance was negligible. In order to improve financial performance and reduce the likelihood of future non-performing loans, the study advises banks to regularly monitor loan performance and carefully assess clients' credit histories and repayment capacities.

Munangi and Sibindi (2020) examined the impact of credit risk on the financial performance of 18 South African banks for the period 2008 to 2018. This study investigated the relationship between credit risk and financial performance using proxies such as non-performing loans (NPLs) and return on assets (ROA) or return on equity (ROE). The study finds a negative correlation between credit risk and financial performance, meaning that as the percentage of non-performing loans increases, bank profitability decreases. The study also showed that growth enhanced financial outcomes, suggesting that expansion increases production capacity. Additionally, a positive correlation was discovered between capital adequacy and financial performance, suggesting that banks may become more competitive by having higher capital adequacy ratios. A large capital base, nevertheless, could also be interpreted as an indication of inefficiency or resource mismanagement. The study was unable to determine a direct correlation between bank size and profitability. Additionally, it was found that bank leverage and financial performance were negatively correlated. In order to reduce non-performing loans, the study advises banks to implement strict credit policies. It also suggests that regulatory bodies should strengthen their oversight in order to guarantee that credit risk management laws are followed and to avert bank failures.

Nelson (2020) identified credit risk indicators and profitability measurement ratios for the years 2010–2019 in order to investigate the effect of credit risk management on the profitability of BGFI Bank Congo. Based on a number of credit risk management metrics, the results imply that credit risk management has a substantial impact on profitability. In particular, Return on Equity (ROE) is adversely affected by the Non-Performing Loan Ratio (NPLR), Capital Assets Ratio (CAR), and Loan Loss

Provision Ratio (LLPR). Notwithstanding these drawbacks, CAR has a positive impact on ROA (return on assets) and the ratio of ROE to RCLSTF (client loans and short-term financing). All things considered, credit risk management has a big impact on profitability. Furthermore, a bank's profitability is greatly impacted by important credit risk management metrics like the Capital Adequacy Ratio and the Loan Loss Provision Ratio (LLPR).

Al-Eitan and Bani-Khalid (2019) examined credit risk and financial performance of the Jordanian commercial banks: a panel data analysis. This study looked at how credit risk (CR) affected Jordanian commercial banks that were listed between 2008 and 2017 on the Amman Stock Exchange in terms of their financial performance. The study evaluated sixteen listed banks using panel data analysis that included both fixed and random effects models, as well as the Generalized Least Squares (GLS) method. The results showed that Return on Equity (ROE) and Return on Assets (ROA) are highly and adversely impacted by credit risk. Furthermore, credit risk measured by ratios like doubtful debts to total loans, non-performing loans, and loan losses to total loans has a negative and significant impact on both ROA and ROE, even though total deposits and bank size have a positive and significant influence on these banks' financial performance.

Annor and Obeng (2017) examined the impact of credit risk management on the profitability of 6 selected commercial banks listed on the Ghana stock exchange. The purpose of the study was to assess the relationship between credit risk and the profitability of commercial banks traded on the Ghana Stock Exchange. It looked into how Return on Equity (ROE) related to different credit risk indicators, such as the ratio of non-performing loans to assets, the loan loss provisions ratio, the loan to asset ratio, and the capital adequacy ratio. The Ghana Banking Survey and the yearly reports of six particular banks were the sources of secondary data. A panel estimation framework was employed in conjunction with the Random Effect Model. The results of the analysis showed a strong correlation between credit risk management and bank profitability. More specifically, profitability demonstrated strong negative correlations with the loan to asset ratio, non-performing loan ratio, and loan loss provisions ratio, but it was positively correlated with the capital adequacy ratio. To lower risk and boost profitability, the study advises banks to carefully evaluate and manage these credit risk indicators.

Otieno and Nyagol (2016) examined relationship between credit risk management and financial performance: empirical evidence from microfinance banks in Kenya. This study evaluated the connection between Kenyan microfinance banks' (MFBs') financial performance and credit risk management. It concentrated on the relationship between MFB performance and the Portfolio at Risk (PAR) and Loan Loss Provision Coverage Ratio (LLPCR). Twelve licensed MFBs were the focus of the study, which employed a longitudinal methodology and panel data from 2011 to 2015, of which six were specifically sampled. To show risk exposure and performance trends, secondary quantitative data were taken from the banks' financial reports and subjected to descriptive statistics and Pearson correlation analysis. The system GMM technique was used to estimate a multiple regression model that tested the significance of the relationship between risk management and financial performance. Return on Equity (ROAE) and Return on Assets (ROAA) showed a significant negative correlation, as indicated by the GMM regression coefficient of -0.2. The study discovered a significant inverse relationship (r=-0.68) between performance and the credit risk management metrics (PAR and LLPCR). The study's conclusion, which emphasizes the significance of competent credit risk management, is that credit risk management significantly affects MFB performance.

### 2.2.1 2.2.1 Review of Journals/Articles in National Context

Pandey and Joshi (2023) investigated impact of credit risk management on profitability of Nepalese commercial banks. The main objective of the study was to explore the relationship between credit risk management and the profitability of Nepalese commercial banks. The study focused on capital adequacy ratio, default rate, and cost per loan asset as independent variables, with Return on Assets (ROA) and Return on Equity (ROE) as the dependent variables. Secondary data were sourced from the supervision report of Nepal Rastra Bank and the annual reports of selected commercial banks. Regression models were employed to assess the impact of credit risk management on profitability. The results revealed that the beta coefficients for default rate and cost per loan asset were statistically significant and negatively correlated with profitability measures (ROA and ROE). Conversely, the capital adequacy ratio had a positive and statistically significant beta coefficient with both ROA and ROE, indicating a positive correlation between capital adequacy and profitability.

Shrestha (2022) analyzed effect of credit risk on profitability of Nepalese commercial banks. The effect of credit risk on the profitability of commercial banks in Nepal was examined in this study. Return on Assets (ROA) served as the indicator of profitability, and ratios like Total Loan to Total Deposit (TL/TD), Cash Reserve Ratio (CRR), Nonperforming Loan to Total Loan (NPL/TL), and Loan Loss Provision to Total Loan (LLP/TL) were used to quantify credit risk. Using the Fixed Effect model, the analysis covered annual data from eighteen commercial banks for the years 2013–14–2018–19. The results showed that Nepalese commercial banks' profitability is highly impacted by credit risk. More specifically, it was discovered that TL/TD had a favorable impact on profitability whereas LLP/TL and NPL/TL had major negative effects. According to the study, bank management should lower the LLP/TL and NPL/TL ratios while raising the TL/TD ratio in order to improve profitability.

Khanal (2021) examined the evaluation of effects of credit-risk on return on assets of commercial banks in Nepal. This study investigated the impact of credit risk ratios on the Return on Assets (ROA) of commercial banks in Nepal. It employed both exploratory and descriptive research designs, including a review of various publications and secondary data collection from Nepal Rastra Bank websites. Multiple regression analysis was used to analyze the data. The findings revealed an inverse correlation between credit risk ratios and ROA, indicating that higher credit risk negatively affects the profitability of Nepalese commercial banks. The results provide substantial evidence that credit risk management metrics significantly influence the performance of these banks.

Chhetri (2021) examined effect of credit risk management on financial performance of Nepalese commercial banks. This study's main objective was to evaluate the effect of credit risk on Nepal's commercial banks' financial performance. Regression analysis of panel data from seventeen commercial banks with eighty-five observations between 2015 and 2020 showed that the Non-Performing Loans Ratio (NPLR) negatively affects financial performance as measured by Return on Assets (ROA) in a statistically significant way. The study discovered that bank size (BS) and capital adequacy ratio (CAR) have a negative impact on ROA, despite the fact that these effects are statistically insignificant. The Credit to Deposit Ratio (CDR) demonstrated a positive but not statistically significant relationship with ROA, whereas the

Management Quality Ratio (MQR) showed a positive and significant correlation with ROA. The report suggests that Nepalese commercial banks focus on effective credit risk management, enhance their loan management and credit analysis processes, and work to reduce the high percentage of non-performing loans in order to improve their financial performance.

Shrestha and Nirouala (2021) investigated the consequence of credit performance and capital adequacy: evidence from commercial banks in Nepal. This study investigated the relationship between capital adequacy and credit performance in Nepalese commercial banks using the random effect Generalized Least Squares (GLS) model. A balanced panel data set of 19 commercial banks that were chosen based on judgment was used for the analysis. The Return on Assets (ROA) was used as a measure of profitability, and other important variables included the Non-Performing Loan Ratio (NPLR), Capital Adequacy Ratio (CAR), Credit to Deposit Ratio (CDR), and Interest Rate Spread (IRS). The findings showed that while CAR and IRS positively contribute to ROA, CDR and NPLR significantly reduce ROA. The relationship between CAR and ROA did not, however, reach statistical significance. The study's conclusions offer regulatory bodies significant information they can use to improve regulatory frameworks and increase banks' operational efficiency.

Risal and Poudel (2020) examined the role of credit risk in performance difference between A and B class banks in Nepal. This study explored the performance differences between financial institutions in A and B classes as influenced by credit risk. The analysis used dynamic panel data from eleven national-level development banks and all 28 commercial banks for the period 2008 to 2019. The Arellano-Bond technique was applied to address unobserved heterogeneity and minimize bias in parameter estimation, accounting for both cross-sectional and temporal dimensions. The findings revealed significant differences in credit risk between A class and B class banks across various metrics, except for Return on Assets (ROA). A class commercial banks were found to be less vulnerable, showing higher Return on Equity (ROE) and somewhat higher Net Interest Margin (NIM) compared to B class banks. The results indicated that lagged performance variables are significant predictors of future performance for both classes of banks. The study recommended that commercial banks focus on monitoring their Loan Loss Provision to Total Loans and

Advances (LLPTLA) to enhance performance, while development banks should maintain a favorable Credit to Deposit Ratio (CDR) as it significantly impacts performance indicators. Control variables had minimal impact on performance, but inflation was found to negatively affect performance. The study also highlighted the need for further research to resolve conflicting findings regarding the relationship between bank performance and real GDP growth.

Shah and Vongbusin (2019) examined credit risk management and profitability: A study from Nepalese commercial bank. The primary aim of this study was to examine the relationship between credit risk management and profitability in Nepalese commercial banks. The independent variables considered were the Non-Performing Loan Ratio, Leverage Ratio, Capital Adequacy Ratio, Loan Loss Provision, and Credit Interest to Credit Facilities, with Return on Assets (ROA) as the dependent variable. Data were sourced from the Banking and Financial Statistics, the Bank Supervision Report of Nepal Rastra Bank, and the Annual Reports of selected commercial banks, covering 250 observations from 25 banks. The analysis employed a combination of the Independent t-test, Pearson's Correlation, Analysis of Variance (ANOVA), and multiple regression. The results revealed that ROA had a negative association with the Capital Adequacy Ratio, Leverage Ratio, Non-Performing Loan Ratio, and Loan Loss Provision Ratio. Conversely, ROA was positively correlated with Credit Interest to Credit Facilities.

Poudel (2018) investigated impact of credit risk on profitability of commercial banks in Nepal. This study's primary goal was to evaluate how credit risk affected Nepal's commercial banks' profitability. Fifteen commercial banks that operated in Nepal between 2002 and 2003 and 2014 and 2015 provided data. The study used the one-way Fixed Effect Model (FEM) to analyze panel data by regressing Return on Equity (ROE), a profitability metric, against variables unique to banks as well as macroeconomic variables. The findings showed that credit risk significantly reduces Nepalese commercial banks' profitability. Furthermore, it was discovered that the negative effects of inflation, interest spread rates, and solvency ratios on profitability were negligible. On the other hand, it has been demonstrated that GDP growth, total assets, and the capital adequacy ratio greatly increase profitability. The study also

discovered that interbank interest rates had a marginally favorable effect on profitability.

Shrestha (2017) examined the impact of credit risk management on profitability: Evidence from Nepalese Commercial Banks. The main objective of this research was to investigate the impact of credit risk management on the profitability of commercial banks in Nepal. The study used descriptive statistics, correlation analysis, and diagnostic tests for linear regression model assumptions to analyze the data. The findings revealed that the Capital Adequacy Ratio and Assets Growth Ratio had a significant positive effect on both Return on Assets (ROA) and Return on Equity (ROE). Conversely, the Non-Performing Loan Ratio (NPLR) and Leverage Ratio had a significant negative impact on ROA and ROE. The Cash Reserve Ratio was found to have an insignificant negative effect on both ROA and ROE. Additionally, the Cost per Loan Assets Ratio had an insignificant positive effect on ROA but a significant positive impact on ROE.

Maharjan et al. (2016) investigated the relationship between bank credit risk, liquidity and profitability in Nepalese commercial banks. This study investigated the connection between Nepalese commercial banks' profitability, liquidity, and bank credit risk. Using data from 2008 to 2013, a pooled cross-sectional analysis of 120 observations from 20 commercial banks was employed. Bank websites, yearly reports, and financial and banking statistics from Nepal Rastra Bank were among the data sources. Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM) were examined as dependent variables in the study, while the independent variables included the ratios of total debt to equity, loan to deposit, non-performing loan to gross loan, and a measure of "less caution." The average non-performing loan ratio was 2.96 percent, and the average ROE and ROA were 12.95 and 1.85%, respectively, according to the results. The results of the regression analysis indicated that the beta coefficients for the non-performing loan to gross loan ratio and the total debt to equity ratio were positive, while the beta coefficients for the loan to deposit ratio and less caution were negative. At the one percent significance level, the non-performing loan to gross loan coefficient, the debt-to-equity ratio, and the less caution coefficient were significant. The study came to the conclusion that the main variables affecting the credit risk, profitability, and liquidity of Nepalese

commercial banks are non-performing loans, the loan to deposit ratio, and a lack of caution.

Bhattarai (2016) analyzed effect of credit risk on the performance of Nepalese commercial banks. This study looked at how credit risk affected Nepalese commercial banks' performance using both descriptive and causal comparative research designs. The analysis employed regression modeling and comprised aggregated data from 14 commercial banks spanning the years 2010 to 2015. The findings indicated that, although not substantially, the Capital Adequacy Ratio and Cash Reserve Ratio had a positive impact on Return on Assets (ROA). On the other hand, Non-Performing Loans significantly reduced ROA. Furthermore, it was discovered that Bank Size and Cost per Loan significantly improved ROA. According to the study's findings, bank performance and credit risk indicators are significantly correlated.

### 2.3 Research Gap

It refers to the study gap related to previous studies. The connection between credit risk and profitability has been the subject of numerous studies in the past. However, the extensive testing, crucial variable changes, and limited conclusions of previous studies limit their findings. The goal of this study project differs greatly from that of other investigations. Firstly, the studies of credit risk and profitability of banks were made on different period. They had studies the credit risk and profitability of banks on old periods. It became necessary to do new research study on credit risk and profitability of recent periods up to 2021/22. Similarly, the impact of credit risk on profitability evaluation of four development banks was not available on previous studies. To overcome this lacking, a new research study was required to evaluate the credit risk and profitability of four development banks. Moreover, this study is also different with previous studies in explanatory variables such as cash reserve ratio, loan to deposit ratio, non-performing loan to loan ratio, bank size and leverage ratio and dependent variables, profitability (return on assets and return on equity to analyze the impact of credit risk on profitability of Nepalese development banks. However, to overcome the limitation of previous studies, this study includes different tools of descriptive analysis, correlation analysis, and regression analysis as specific tools which were not included in previous studies. That’s why, this study tries to fulfill research gap.

# CHAPTER - III

## RESEARCH METHODOLOGY

The term "research methodology" refers to the systematic processes and approaches a researcher uses to investigate a subject with defined objectives. It encompasses the various methods and procedures employed throughout the research, including the design, data collection, and analysis stages. Essentially, research methodology provides a structured framework for addressing the research problem and details the tools, techniques, and strategies used in conducting the study and interpreting the results. This chapter describes research design, population and sample, and sampling design, nature and sources of data, method of analysis and research framework and definition of variables.

### 3.1 Research Design

This study employs both descriptive and causal comparative research designs. The descriptive research design is used to analyze credit risk and profitability by examining the average values, standard deviations, and ranges (maximum and minimum) of the data, thereby providing insights into the characteristics of development banks. Meanwhile, the causal comparative research design is used to assess the impact of credit risk on the profitability of these development banks.

### 3.2 Population and Sampling, and Sampling Design

At present, there are 16 development banks operating in Nepal (till June, 2023). They constitute the population. Among of them, only four development banks, namely Shangri-La Development Bank Limited, Jyoti Bikas Bank Limited, Muktinath Bikas Bank Limited, Kamana Sesa Bikas Bank Limited are selected for the study of credit risk as sample on the basis of purposive sampling method. These sample development banks are top gainer banks of Nepal because these banks are top four in profitability in the present context and managing credit risk. So, the researcher has chosen these development banks.

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

The study utilizes secondary data to achieve its objectives. This data is sourced from various published materials, including annual reports from relevant offices, websites, and previous research. Specifically, the study gathers data from audited financial statements, such as balance sheets and profit and loss accounts, of selected development banks for the period from 2012/13 to 2021/22.

### 3.4 Method of Data Analysis

This study employs multiple regressions, correlation analysis, and descriptive analysis to examine the impact of credit risk assessed through various credit variables on the profitability of development banks in Nepal.

#### 3.4.1 Descriptive Analysis

**Mean ($\bar{X}$)**

The arithmetic mean, often called the average, is calculated by summing all the values in a dataset and then dividing this total by the number of observations. It represents the central point of the data set, providing a measure of central tendency. The formula for computing the arithmetic mean is:

$$\text{Mean } (\bar{X}) = \frac{x_1 + x_2 + x_3 + x_4 \ldots\ldots\ldots\ldots + x_n}{n} \quad \text{Or, } \bar{X} = \frac{\Sigma x}{n}$$

Where,

$\bar{X}$ = Arithmetic Mean return

$x_1, x_2, x_3, x_4 \ldots\ldots\ldots\ldots x_n$ = Set of Observation

$\Sigma x$ = Sum of given Observation

n = Total number of Observations

**Standard Deviation**

Since the standard deviation meets most criteria for an effective measure of dispersion, it is considered an absolute measure of variability. A higher standard deviation indicates greater variability within the data, while a lower standard deviation reflects less variability. Dispersion measures how much the data values deviate from the central value, offering insights into the data's consistency and spread. The standard deviation is calculated using the following formula:

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

### 3.4.2 Correlation Analysis

The correlation coefficient shows how one independent variable and one dependent variable are related. It is a method for determining the relationship between these two variables. If two variables are so correlated that changes in one variable's value also affect changes in the other, then the two have a correlation coefficient.

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

Where,

r = coefficient of correlation

$\Sigma XY$ = Sum of product of two series.

$\Sigma X^2$ = Sum of squared in X series

$\Sigma Y^2$ = Sum of squared in Y series

n = number of years

This coefficient's value can never be less than -1 or greater than + 1. Therefore, the limits of this coefficient are + 1 and -1. Positive correlation between variables is indicated by a value of r = + 1, and vice versa. Zero indicated no correlation at all.

### 3.4.3 Multiple Regressions Analysis

By fitting a linear equation to observed data, multiple linear regression aims to predict the relationship between two or more explanatory factors and a response variable. In the dependent variable y, each value of the independent variable x corresponds to a particular value. The relationship between the explanatory factors and the dependent variables (bank profitability variables), such as return on equity (ROE) and return on assets (ROA), is assessed using regression analysis. The explanatory variables, which are independent variables, are derived from internal factors specific to banks, including the size of the bank (SIZE), the leverage ratio (LEV), the credit to deposit ratio (CDR), the cash reserve ratio (CRR), and the non-performing loan ratio (NPLR). As a result, the relationship and effect of the study variables have been examined using the model that follows.

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

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

Where:

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

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

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

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

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

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

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

$\beta_0$ = The intercept (constant)

$\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$ $\beta_5$ = Regression coefficient of independent variables.

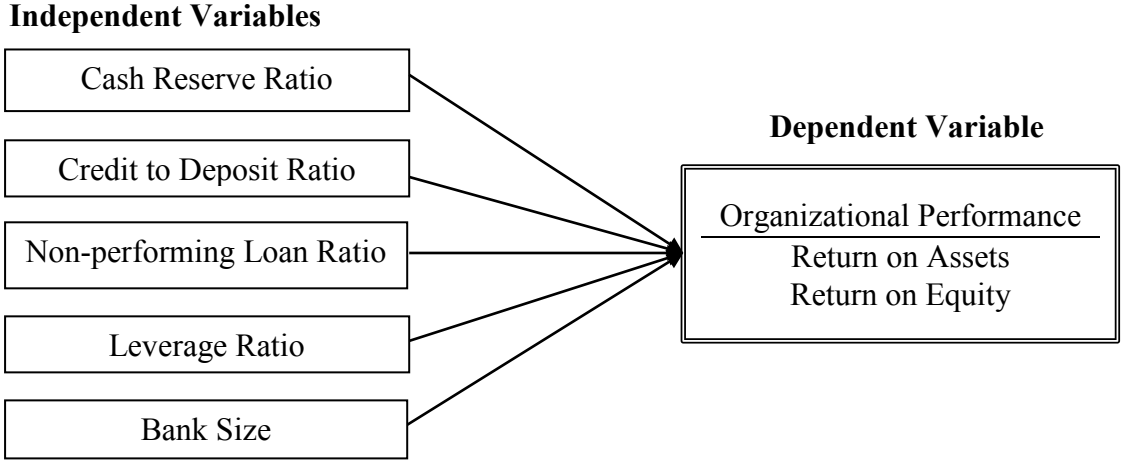
e = error component.

### 3.5 Research Framework and Definition of the Variables

A research framework is essential for guiding the research process and illustrating the relationships between variables. It helps in understanding how different factors interact and influence one another. Here's a general structure you might use for developing a conceptual framework for studying the impact of credit risk management on bank profitability:

**Figure 1**

*Research Framework of the Study*




*Source: Bhattarai (2016); Poudel (2018); Munangi and Sibindi (2020) and Shrestha and Nirouala (2021) and Biswas, Nath, Biswas and Rashid (2021)*

**Return on assets (ROA)**

Previous studies on the link between credit risk and bank performance have highlighted return on assets (ROA) as a key indicator of a bank's financial success (Shrestha, 2022). ROA gauges how effectively bank managers use the bank's actual investment resources to generate profits. It is calculated by dividing net profit after tax by total assets. This ratio shows the profit generated per dollar of assets and provides insight into how well management utilizes the bank's investment and financial resources. ROA is influenced by both the bank's internal policy decisions and external factors like economic conditions and regulatory laws. It reflects the efficiency of asset management in generating profits.

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

**Return on equity (ROE)**

The return on equity (ROE) ratio is a widely used internal performance measure of shareholder value. It represents the returns distributed to shareholders based on their equity investment. According to Poudel (2018), ROE measures a company's profitability by showing how effectively it generates profit from the shareholders' capital. This ratio indicates the percentage of net income relative to stockholder equity. It is calculated by dividing net profit after taxes, minus any preferred dividends, by the average total shareholder equity for the fiscal year.

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

**Cash reserve ratio**

The cash reserve ratio (CRR) is a key control variable for examining the relationship between credit risk and bank performance. The CRR is the minimum percentage of customer deposits that development banks must keep as reserves with the central bank. By adjusting the CRR, the central bank can influence liquidity levels. Increasing the CRR reduces the amount of capital available in the economy, leading to fewer funds for banks to lend and consequently diminishing the money supply. This restriction can slow economic growth by limiting spending and investment. Additionally, banks may experience lower interest rates and reduced profitability, as holding cash reserves generates no income for them and can be seen as a drain on

profitability. Bhattarai (2016) found that the impact of the CRR on return on assets (ROA) is minimal.

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

**Credit to deposit ratio (CDR)**

The loan to deposit ratio (CDR) is calculated by dividing the total amount of loans and advances by the total deposits. This ratio is crucial for lending institutions, which need to balance their liquidity to maintain regular operations. Since most loans are not liquid and take time to mature, banks must also keep a portion of their non-lending assets in short-term securities to ensure they have immediate access to funds if needed. The CDR is used to assess credit risk by comparing the amount of loans issued to the amount of deposits received. A bank's ability to manage its loan and deposit ratios effectively impacts its financial health. Essentially, banks borrow funds at higher interest rates to lend out, which creates a debt to depositors. A well-managed bank maintains a balance of secure loans that generate sufficient interest to cover depositors' accounts (Shrestha, 2022).

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

**Non-performing loan ratio**

The non-performing loan ratio (NPLR) is a critical measure of credit risk and financial stability. A rising NPLR often signals a failure in a bank's credit policy, reduced bank revenues, and can be a significant factor in financial crises. The NPLR reflects the proportion of non-performing loans within the total loan portfolio, serving as an indicator of how effectively banks manage their credit assessments (Bhattarai, 2016). Although "non-performing loan" typically refers to loans with late payments rather than outright defaults, it indicates that there is a low likelihood of the debt being fully recovered if it becomes non-performing.

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

**Leverage ratio**

A leverage ratio is a financial metric used to assess the extent of a company's debt relative to its equity or its ability to manage its debts. The debt-to-equity ratio, a common measure of leverage, indicates the proportion of a company's assets that is financed by debt compared to equity. Companies that rely on debt must make regular interest payments, and higher levels of debt lead to greater interest expenses, which can reduce earnings available to equity holders. As a result, investors generally prefer companies with lower levels of debt. Shrestha (2017) found that a higher leverage ratio negatively impacts banks' profitability.

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

**Bank size (SIZE)**

The natural logarithm of total assets is used to measure a bank's size. This variable has been included as an internal factor in the study due to its impact on bank performance. Poudel (2018) found that larger bank size negatively affects performance, arguing that managing a larger bank becomes more complex. Conversely, Bhattarai (2016) discovered a positive effect of bank size on performance, suggesting that larger banks benefit from economies of scale, which reduces costs, and they can also secure capital at lower rates.

Bank size = Natural logarithm of total assets of development banks

# CHAPTER - IV

# RESULTS AND DISCUSION

This chapter constitutes the core of the study. It begins with a descriptive analysis, followed by an examination of the results from pooled regression analysis and panel data analysis. Building on the methodology and data description from Chapter three, secondary data for each variable were collected from Nepali development banks covering the period from 2012/13 to 2021/22. Initially, descriptive statistics are calculated to understand the nature of the dataset. Subsequently, panel data analysis is performed to test the various hypotheses put forward in the study. The following sections will discuss the results of these tests.

## 4.1 Results

### 4.1.1 Position and Status of Credit Risk Indicators of Development Banks

Credit risk positions have been assessed using both statistical and financial tools, based on data from the past 10 years for a sample of development banks. This study evaluates the profitability of four development banks by analyzing metrics such as the cash reserve ratio, credit-to-deposit ratio, non-performing loan ratio, leverage ratio, and bank size.

#### 4.1.1.1 Cash Reserve Ratio

The cash reserve ratio (CRR) is one of the control variables used to explore the relationship between credit risk and the performance of development banks. The CRR represents the minimum percentage of customer deposits that development banks must keep as reserves with the central bank. By adjusting the CRR, the central bank can influence liquidity levels. An increase in the CRR reduces the amount of available capital in the economy, limiting the funds development banks can lend out, thereby decreasing the money supply. This reduction in liquidity can constrain spending and investment, potentially slowing economic growth. Furthermore, development banks may experience a drop in profitability and lower interest rates as a result.

**Table 1**

*Cash Reserve Ratio*

(In percent)

| Year | JBBL | MNBBL | KSBBL | SADBL |
|---|---|---|---|---|
| 2012/13 | 5.54 | 8.06 | 7.60 | 17.01 |
| 2013/14 | 4.57 | 6.64 | 5.02 | 11.23 |
| 2014/15 | 5.28 | 7.95 | 5.33 | 9.81 |
| 2015/16 | 5.36 | 8.49 | 5.44 | 9.71 |
| 2016/17 | 5.35 | 9.74 | 5.44 | 11.52 |
| 2017/18 | 5.16 | 5.34 | 24.25 | 7.21 |
| 2018/19 | 4.32 | 6.49 | 21.76 | 5.97 |
| 2019/20 | 3.74 | 7.58 | 8.45 | 7.17 |
| 2020/21 | 3.10 | 4.72 | 11.79 | 5.15 |
| 2021/22 | 3.23 | 4.59 | 12.34 | 6.16 |
| Mean | 4.57 | 6.96 | 10.74 | 9.09 |
| SD | 0.93 | 1.71 | 7.00 | 3.58 |
| CV | 20.31 | 24.53 | 65.16 | 39.34 |

Source: Appendix –I

Table 1 illustrates the cash reserve ratios of the sample development banks in Nepal. The ratios exhibit variability, with KSBBL having the highest ratio of 24.25 percent in the fiscal year 2017/18, and JBBL having the lowest at 3.10 percent in the fiscal year 2020/21. KSBBL's average ratio stands at 10.74 percent, the highest among the banks, while JBBL's average ratio is the lowest at 4.57 percent. This suggests that KSBBL maintains a strong liquidity position, ensuring smooth daily operations. However, the reduction in lending capacity has led to decreased investments, interest income, and profitability for KSBBL. Conversely, JBBL shows the lowest standard deviation among the banks, indicating the least risk, and has the highest consistency with the lowest coefficient of variation (CV) of 20.31 percent.

#### 4.1.1.2 Credit to Deposit Ratio

The loan-to-deposit ratio (CDR), as indicated by its name, is calculated by dividing the total amount of loans and advances by the total deposits. This ratio measures how well a lending institution is using its deposits to fund loans, which is a key indicator of its profitability. Banks need to maintain a certain level of liquidity to support their regular business activities. The CDR reflects the balance between the money flowing out as loans and the money coming in as deposits. When loans are secured against debtors, they can generate higher interest income, contributing to the bank's profitability.

**Table 2**

*Credit to Deposit Ratio*

(In percent)

| Year | JBBL | MNBBL | KSBBL | SADBL |
|---|---|---|---|---|
| 2012/13 | 83.95 | 81.86 | 85.09 | 77.31 |
| 2013/14 | 80.65 | 84.22 | 77.83 | 79.66 |
| 2014/15 | 78.27 | 85.14 | 80.42 | 80.45 |
| 2015/16 | 76.74 | 86.89 | 84.88 | 87.10 |
| 2016/17 | 85.36 | 90.37 | 93.23 | 83.02 |
| 2017/18 | 79.90 | 82.07 | 84.26 | 81.96 |
| 2018/19 | 84.24 | 81.55 | 88.15 | 86.11 |
| 2019/20 | 82.46 | 80.93 | 81.60 | 81.58 |
| 2020/21 | 86.11 | 82.76 | 87.26 | 84.45 |
| 2021/22 | 89.00 | 82.58 | 87.59 | 83.87 |
| Mean | 82.67 | 83.84 | 85.03 | 82.55 |
| SD | 3.80 | 2.93 | 4.39 | 2.99 |
| CV | 4.59 | 3.50 | 5.17 | 3.62 |

Source: Appendix –I

Table 2 presents the credit-to-deposit ratios of the sample development banks in Nepal. The ratios exhibit variability across the banks. In the fiscal year 2016/17, KSBBL recorded the highest credit-to-deposit ratio at 93.23 percent, while JBBL had the lowest ratio at 76.74 percent in the fiscal year 2015/16. KSBBL's highest average ratio is 85.03 percent, whereas SADBL has the lowest average ratio at 82.55 percent. This indicates that KSBBL is most effective in utilizing its deposits for loans and advances while maintaining profitability. Among the banks, MNBBL has the lowest standard deviation, reflecting the lowest level of risk, and demonstrates the highest consistency with the lowest coefficient of variation (CV) of 3.50 percent.

#### 4.1.1.3 Non-performing Loan Ratio

The quality of a bank's loan portfolio significantly impacts its performance. Losses from overdue loans represent a major risk for banks. Consequently, nonperforming loan ratios are key indicators of asset quality. Researchers use various financial ratios to assess bank performance, but maintaining a low percentage of nonperforming loans is crucial for development banks. A high percentage of nonperforming loans can adversely affect a bank's performance. Therefore, a low nonperforming loan ratio relative to total loans indicates a healthier portfolio and better overall performance for the bank.

**Table 3**

*Non-performing Loan Ratio*

(In percent)

| Year | JBBL | MNBBL | KSBBL | SADBL |
|---|---|---|---|---|
| 2012/13 | 3.31 | 0.59 | 0.19 | 2.17 |
| 2013/14 | 2.67 | 0.45 | 0.16 | 0.68 |
| 2014/15 | 1.98 | 0.19 | 0.29 | 0.60 |
| 2015/16 | 1.39 | 0.09 | 1.03 | 0.65 |
| 2016/17 | 0.96 | 0.02 | 1.39 | 0.60 |
| 2017/18 | 0.40 | 0.004 | 1.13 | 1.62 |
| 2018/19 | 0.54 | 0.07 | 0.97 | 0.80 |
| 2019/20 | 0.92 | 0.46 | 1.79 | 1.13 |
| 2020/21 | 0.84 | 0.23 | 1.61 | 1.39 |
| 2021/22 | 1.47 | 0.21 | 2.45 | 0.98 |
| Mean | 1.45 | 0.23 | 1.10 | 1.06 |
| SD | 0.95 | 0.20 | 0.75 | 0.52 |
| CV | 65.34 | 88.01 | 67.92 | 49.32 |

Source: Appendix –I

Table 3 shows the non-performing loan (NPL) ratios, or credit risk, for the sample development banks in Nepal. All the banks have average NPL ratios below five percent. The highest NPL ratio was 3.31 percent for JBBL in the fiscal year 2012/13, while the lowest was 0.004 percent for MNBBL in the fiscal year 2017/18. JBBL's highest average ratio is 1.45 percent, whereas MNBBL's average ratio is the lowest at 0.23 percent. This indicates that MNBBL has the lowest credit risk, effectively managing its non-performing loans. MNBBL's low standard deviation suggests the least amount of risk, and SADBL demonstrates the highest consistency in its ratios with the lowest coefficient of variation (CV) of 49.32 percent.

#### 4.1.1.4 Leverage Ratio

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

**Table 4**

*Leverage Ratio*

(In percent)

| Year | JBBL | MNBBL | KSBBL | SADBL |
|---|---|---|---|---|
| 2012/13 | 4.79 | 10.10 | 8.26 | 5.85 |
| 2013/14 | 5.83 | 8.99 | 8.45 | 7.75 |
| 2014/15 | 6.38 | 8.26 | 5.50 | 7.89 |
| 2015/16 | 6.71 | 8.62 | 8.40 | 7.86 |
| 2016/17 | 4.17 | 7.56 | 4.87 | 8.41 |
| 2017/18 | 6.43 | 8.59 | 5.15 | 5.79 |
| 2018/19 | 8.10 | 10.68 | 7.22 | 6.88 |
| 2019/20 | 8.40 | 10.40 | 10.43 | 8.95 |
| 2020/21 | 10.41 | 13.80 | 12.37 | 11.89 |
| 2021/22 | 11.67 | 13.99 | 12.49 | 12.98 |
| Mean | 7.29 | 10.10 | 8.31 | 8.42 |
| SD | 2.38 | 2.23 | 2.78 | 2.36 |
| CV | 32.61 | 22.10 | 33.38 | 27.99 |

Source: Appendix –I

Table 4 presents the leverage ratios of the development banks in Nepal. MNBBL recorded the highest leverage ratio of 13.99 percent in the fiscal year 2021/22, while JBBL had the lowest leverage ratio of 4.17 percent in the fiscal year 2016/17. MNBBL also has the highest average leverage ratio at 10.10 percent, whereas JBBL has the lowest average leverage ratio at 7.29 percent. This suggests that MNBBL relies more heavily on creditor financing compared to owner financing. Despite having the highest debt-to-equity ratio, MNBBL exhibits the least risk, evidenced by its lowest standard deviation among the sample banks. Furthermore, MNBBL demonstrates the highest consistency with the lowest coefficient of variation (CV) of 22.10 percent.

#### 4.1.1.5 Bank Size

The natural logarithm of total assets represents the bank's size, which is included as a bank-specific internal independent variable in this study due to its impact on performance. The relationship between bank size and performance can be either positive or negative. As a bank grows larger, managing it can become more challenging, potentially negatively affecting performance. Conversely, larger banks benefit from economies of scale, allowing them to raise capital more cheaply. Therefore, bank size is a crucial indicator of financial performance.

**Table 5**

*Bank Size (Total Assets)*

(Rs. in million)

| Year | JBBL | MNBBL | KSBBL | SADBL |
|---|---|---|---|---|
| 2012/13 | 4901.93 | 4423.20 | 2399.72 | 2530.16 |
| 2013/14 | 6194.76 | 6029.44 | 3025.38 | 7462.21 |
| 2014/15 | 7423.09 | 9000.47 | 2588.70 | 9167.55 |
| 2015/16 | 8917.85 | 12936.75 | 5504.55 | 11959.42 |
| 2016/17 | 13188.43 | 19592.34 | 6997.61 | 16043.81 |
| 2017/18 | 23401.93 | 34766.24 | 19459.67 | 21270.66 |
| 2018/19 | 36459.94 | 51991.40 | 26691.89 | 26283.65 |
| 2019/20 | 42361.10 | 66348.09 | 36621.71 | 32898.33 |
| 2020/21 | 59879.02 | 101131.72 | 51304.90 | 47836.88 |
| 2021/22 | 71407.87 | 121083.27 | 59352.25 | 59578.99 |
| Mean | 27413.59 | 42730.29 | 21394.64 | 23503.17 |
| SD | 24064.59 | 41676.02 | 21371.69 | 18517.76 |
| CV | 87.78 | 97.53 | 99.89 | 78.79 |

Source: Appendix –I

Table 5 shows the bank sizes of the sample development banks in Nepal. MNBBL had the largest bank size, recorded at Rs.121,083.27 million in the fiscal year 2021/22, while KSBBL had the smallest size at Rs.2,399.72 million in the fiscal year 2012/13. MNBBL also had the largest average bank size at Rs.42,730.29 million, whereas KSBBL had the lowest average size at Rs.21,394.64 million. This indicates that MNBBL had the largest average bank size during the study period. Due to economies of scale, MNBBL can reduce costs and obtain capital more cheaply. Among the sample banks, SADBL had the lowest standard deviation, suggesting it carries the least risk. Additionally, SADBL showed the highest level of consistency, with the lowest coefficient of variation (CV) of 78.79 percent.

### 4.1.2 Profitability Position and Status of Banks

Profitability, measured by return on assets (ROA) and return on equity (ROE), has been analyzed using statistical and financial tools based on the past 10 years of data from the sample banks. This study evaluates the profitability of four development banks by examining each bank's ROA and ROE.

#### 4.1.2.1 Return on Assets (ROA)

Return on assets (ROA) is a key indicator used to compare the financial performance of banks. ROA is a financial metric that shows how much profit a bank generates relative to its total assets. It is calculated by dividing the net income for the year by the average total assets for the year. ROA gauges the ability of a bank's management team to generate earnings from the resources the bank uses in its operations.

**Table 6**

*Return on Assets*

(In percent)

| Year | JBBL | MNBBL | KSBBL | SADBL |
|---|---|---|---|---|
| 2012/13 | 1.43 | 2.22 | 2.08 | 3.25 |
| 2013/14 | 1.01 | 2.52 | 2.09 | 0.99 |
| 2014/15 | 1.39 | 2.42 | 3.14 | 1.94 |
| 2015/16 | 1.70 | 2.79 | 1.97 | 1.80 |
| 2016/17 | 1.73 | 2.49 | 1.82 | 2.17 |
| 2017/18 | 1.48 | 1.79 | 1.99 | 1.43 |
| 2018/19 | 1.46 | 1.65 | 1.07 | 1.30 |
| 2019/20 | 1.15 | 1.07 | 0.33 | 0.58 |
| 2020/21 | 1.11 | 1.14 | 1.17 | 0.86 |
| 2021/22 | 0.94 | 1.11 | 1.06 | 1.00 |
| Mean | 1.34 | 1.92 | 1.67 | 1.53 |
| SD | 0.28 | 0.65 | 0.78 | 0.79 |
| CV | 20.58 | 34.11 | 46.83 | 51.37 |

Source: Appendix –I

Table 6 presents the return on assets (ROA) for the sample development banks in Nepal. The highest ROA was 3.25 percent for SADBL in the fiscal year 2012/13, while the lowest was 0.33 percent for KSBBL in the fiscal year 2019/20. MNBBL had the highest average ROA at 1.92 percent, whereas JBBL had the lowest average ROA at 1.34 percent. This suggests that MNBBL effectively manages its assets to optimize returns. JBBL had the lowest standard deviation among the sample banks, indicating the least risk. Additionally, JBBL demonstrated the highest consistency in its ratios, with the lowest coefficient of variation (CV) of 20.58 percent.

#### 4.1.2.2 Return on Equity (ROE)

Return on equity (ROE) is another key indicator used to evaluate profitability. ROE is the most commonly used internal performance metric for assessing shareholder value. It represents the return earned by shareholders on their equity investment. ROE

measures a bank's profitability by showing how much profit the bank generates with the shareholders' invested capital. It is calculated as the percentage of net income generated relative to shareholders' equity.

**Table 7**

*Return on Equity*

(In percent)

| Year | JBBL | MNBBL | KSBBL | SADBL |
|---|---|---|---|---|
| 2012/13 | 8.28 | 24.60 | 19.29 | 22.24 |
| 2013/14 | 6.94 | 25.17 | 19.78 | 8.68 |
| 2014/15 | 10.24 | 22.39 | 20.43 | 17.27 |
| 2015/16 | 13.13 | 26.88 | 18.49 | 15.95 |
| 2016/17 | 8.95 | 21.27 | 10.70 | 20.39 |
| 2017/18 | 10.99 | 17.21 | 12.22 | 9.75 |
| 2018/19 | 13.26 | 19.24 | 8.77 | 10.25 |
| 2019/20 | 10.84 | 12.16 | 3.74 | 5.78 |
| 2020/21 | 12.66 | 16.93 | 15.58 | 11.05 |
| 2021/22 | 11.89 | 16.61 | 14.34 | 13.98 |
| Mean | 10.72 | 20.25 | 14.33 | 13.53 |
| SD | 2.14 | 4.63 | 5.49 | 5.35 |
| CV | 19.93 | 22.85 | 38.29 | 39.54 |

Source: Appendix –I

Table 7 presents the return on equity (ROE) for the sample development banks in Nepal. MNBBL achieved the highest ROE at 26.88 percent in the fiscal year 2015/16, while KSBBL had the lowest ROE at 3.74 percent in the fiscal year 2019/20. MNBBL also has the highest average ROE at 20.25 percent, whereas JBBL has the lowest average ROE at 10.72 percent. This indicates that MNBBL demonstrates the most efficient management in terms of generating profit from shareholders' equity, suggesting superior performance and profitability. JBBL, with the lowest standard deviation among the sample banks, indicates the least risk. Additionally, JBBL shows the highest consistency with the lowest coefficient of variation (CV) at 19.93 percent.

### 4.1.3 Descriptive Statistics of Variables

Table 8 presents the descriptive statistics for the variables utilized in the investigation. The outcome demonstrates the lowest and highest performance measures for Nepal's development banks in terms of profitability metrics, such as ROE and ROA, as well as other independent factors.

**Table 8**

*Descriptive Statistics of Variable of Banks*

| Variables | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| CRR | 40 | 3.10 | 24.25 | 7.8402 | 4.54316 |
| CDR | 40 | 76.74 | 93.23 | 83.5218 | 3.58695 |
| NPLR | 40 | .004 | 3.31 | .9606 | .78324 |
| LEV | 40 | 4.17 | 13.99 | 8.5317 | 2.56028 |
| LSIZE | 40 | 3.38 | 5.08 | 4.2357 | .47711 |
| ROA | 40 | .33 | 3.25 | 1.6160 | .66841 |
| ROE | 40 | 3.74 | 26.88 | 14.7080 | 5.64704 |

Source: Appendix –II

Table 8 presents the descriptive statistics of the dependent and independent variables used in the study. The first independent variable, the cash reserve ratio, ranges from a minimum of 3.10 percent to a maximum of 24.25 percent, with an average of 7.8402 percent and a standard deviation of 4.54316 percent. The credit-to-deposit ratio, another independent variable, has values ranging from a minimum of 76.74 percent to a maximum of 93.23 percent, with an average of 83.5218 percent and a standard deviation of 3.58695 percent. The third independent variable, the non-performing loan ratio, ranges from 0.004 percent to 3.31 percent, with an average of 0.9606 percent and a standard deviation of 0.78324 percent. Leverage ratios during the period ranged from 4.17 percent to 13.99 percent, with an average leverage ratio of 8.5317 percent and a low standard deviation of 2.56028 percent. The control variable, bank size (total assets), ranges from 3.38 to 5.08, with a mean of 4.2357 and a standard deviation of 0.47711. The ROA summary shows a maximum return on assets of 3.25 percent and a minimum of 0.33 percent. The average ROA for the research period is 1.6160 percent, with a standard deviation of 0.66841 percent. This indicates that the sample development banks are able to generate high returns on their assets by efficiently utilizing the assets that contribute most to the overall ROA. The ROE ranges from a minimum of 3.74 percent to a maximum of 26.88 percent, with an average of 14.7080 percent, which is within the satisfactory range of 15 to 25 percent. The standard deviation for ROE is relatively low at 5.64704 percent, suggesting that the sample development banks demonstrate efficient management in generating profits.

### 4.1.4 Correlation Analysis

This study aimed to explore the fundamental relationship between the dependent variable, "profitability," and the independent variables: cash reserve ratio, credit-to-

deposit ratio, non-performing loan ratio, leverage ratio, and bank size. The relationships among these variables were analyzed and documented. The correlation coefficient measures the strength and direction of a linear relationship between two variables, ranging from -1 to +1. A coefficient of +1 indicates a perfect positive relationship, -1 denotes a perfect negative relationship, and 0 signifies no linear relationship. Table 9 presents the correlation matrix for these variables.

**Table 9**

*Pearson Correlation Coefficients of Study Variables*

| | CRR | CDR | NPLR | LEV | LSIZE | ROA | ROE |
|---|---|---|---|---|---|---|---|
| CRR | 1 | | | | | | |
| CDR | .099 | 1 | | | | | |
| NPLR | .108 | -.031 | 1 | | | | |
| LEV | -.180 | .109 | -.213 | 1 | | | |
| LSIZE | -.096 | .258 | -.100 | .670** | 1 | | |
| ROA | .189 | -.049 | -.329* | -.416** | -.663** | 1 | |
| ROE | .057 | .024 | -.536** | .168 | -.315* | .803** | 1 |

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

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

Source: Appendix-III

Table 4.9 displays the results of the correlation test between dependent and independent variables through a correlation coefficient matrix. The analysis indicates that the cash reserve ratio (CRR) shows an insignificant positive correlation with ROA and ROE at a 5 percent significance level. Similarly, the credit to deposit ratio (CDR) has an insignificant negative correlation with ROA and an insignificant positive correlation with ROE. On the other hand, there is a significant negative correlation between the non-performing loan ratio (NPLR) and ROA at a 5 percent significance level, and a significant negative correlation between NPLR and ROE at a 1 percent significance level. Additionally, the leverage ratio (LEV) has a significant negative correlation with ROA but an insignificant positive correlation with ROE. Lastly, the size of the bank exhibits a significant negative correlation with both ROA and ROE.

### 4.1.5 Regression Analysis

Multiple regression analysis is used to examine how a variable changes in relation to other variables. It encompasses various modeling and analytical techniques to explore

the relationship between a dependent variable (such as ROA and ROE) and independent factors (including cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio, and bank size).

#### 4.1.5.1 ROA Regression

ROA is the dependent variable, while the independent variables—cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio, and bank size—are used to analyze the impact of credit risk on the profitability of development banks in Nepal.

**Table 10**

*Model Summary*

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .797[a] | .636 | .582 | .43198 |

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

Source: Appendix-IV

The R-squared value is 0.636, which means that 63.60 percent of the variation in the dependent variable (ROA) is explained by the independent variables (LSIZE, CRR, NPLR, CDR, LEV). The R statistic of 0.797 suggests a strong relationship between the study variables, indicating that ROA is significantly influenced by its independent variables. Additionally, the standard error of the estimate is closely related to the regression analysis.

**Table 11**

*Analysis of Variance (ANOVA)*

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 11.080 | 5 | 2.216 | 11.875 | .000[b] |
| | Residual | 6.345 | 34 | .187 | | |
| | Total | 17.424 | 39 | | | |

a. Dependent Variable: ROA

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

Source: Appendix- IV

ANOVA analysis, using the F-value, indicates that the dependent variables' influence can be explained by various combinations of predictor variables. The findings show that ROA is significantly affected. With an F-value of 11.875 ($p = 0.000 < 0.05$) for the ROA proxy variables (LSIZE, CRR, NPLR, CDR, and LEV), it is clear that there is a strong association between the dependent variable (ROA) and the independent variables.

**Table 12**

*Regression Coefficient of Independent Variables with ROA*

| Variables | Coefficients | t-statistics | p-value | VIF |
|---|---|---|---|---|
| (Constant) | 4.346 | 2.658 | .012 | |
| CRR | .022 | 1.436 | .160 | 1.055 |
| CDR | .020 | .990 | .329 | 1.096 |
| NPLR | -.355 | -3.909 | .000 | 1.057 |
| LEV | -.004 | -.097 | .923 | 1.936 |
| LSIZE | -.992 | -4.910 | .000 | 1.943 |

Source: Appendix-IV

$$ROA = 4.346 + 0.022CRR + 0.020CDR - 0.355NPLR - 0.004LEV - 0.992LSIZE$$

Table 12 displays the regression coefficients for the independent variables—cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio, and bank size as well as the intercept for the dependent variable ROA. The results indicate that the Variance Inflation Factor (VIF) for all independent variables is below 10, suggesting that there is no multicollinearity in the model.

The regression model findings show a positive relationship between the cash reserve ratio (CRR) and ROA, with a coefficient of 0.022. This implies that a 1 unit increase in CRR is associated with a 0.022 percent increase in the return on assets (ROA) of development banks, assuming other variables remain constant. However, at the five percent significance level, the p-value of 0.160 indicates that this effect is statistically insignificant. Therefore, the cash reserve ratio has an insignificant positive impact on the ROA of the sample development banks.

The credit to deposit ratio (CDR) has a coefficient estimate of 0.020, indicating a positive correlation with ROA in the regression results. This means that, holding other variables constant, a 1 percent increase in the credit to deposit ratio leads to a 0.020 percent increase in the development banks' return on assets (ROA). However, with a

p-value of 0.329, the effect of CDR is statistically insignificant at the five percent significance level. Consequently, the credit to deposit ratio has an insignificant positive impact on the ROA of the sample development banks.

The non-performing loan ratio (NPLR) has a coefficient estimate of -0.355, reflecting a negative relationship with ROA. This means that a 1 percent increase in NPLR, while keeping other variables constant, results in a 0.355 percent decrease in the return on assets (ROA) for development banks. The p-value of 0.000 indicates that this effect is statistically significant at the five percent level. Therefore, the non-performing loan ratio has a statistically significant negative impact on the ROA of the sample development banks.

The leverage ratio (LEV) is negatively associated with return on assets (ROA), with a coefficient estimate of -0.004 in the regression results. This suggests that a 1 percent increase in the leverage ratio leads to a 0.004 percent decrease in the development banks' ROA, while holding other variables constant. However, with a p-value of 0.923, the effect of the leverage ratio is statistically insignificant at the five percent significance level. Therefore, the leverage ratio has a statistically insignificant negative impact on the ROA of development banks.

The regression model results show a negative relationship between bank size (LogSize) and ROA, with a coefficient estimate of -0.992. This means that a 1 percent increase in bank size leads to a 0.992 percent decrease in the development banks' ROA, assuming other variables are constant. The p-value of 0.000 indicates that this relationship is statistically significant at the five percent significance level. Thus, bank size (LogSize) has a significant negative impact on the ROA of the banks.

#### 4.1.5.2 ROE Regression

ROE is the dependent variable, with the independent variables being cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio, and bank size. The analysis aims to assess the impact of credit risk on the profitability of development banks in Nepal.

**Table 13**

*Model Summary*

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .792[a] | .627 | .572 | 3.69620 |

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

Source: Appendix- V

The R-squared value is 0.627, meaning that 62.70 percent of the variation in the dependent variable (ROE) is explained by the independent variables (LSIZE, CRR, NPLR, CDR, LEV). The R statistic of 0.792 indicates a very strong relationship between the study variables, suggesting that ROE is highly influenced by its independent variables. Additionally, the standard error of the estimate is closely related to the regression analysis.

**Table 14**

*Analysis of Variance (ANOVA)*

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 779.171 | 5 | 155.834 | 11.407 | .000[b] |
| | Residual | 464.503 | 34 | 13.662 | | |
| | Total | 1243.674 | 39 | | | |

a. Dependent Variable: ROE

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

Source: Appendix- V

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

**Table 15**

*Regression Coefficient of Independent Variables with ROE*

| Variables | Coefficients | t-statistics | p-value | VIF |
|---|---|---|---|---|
| (Constant) | 27.527 | 1.968 | .057 | |
| CRR | .161 | 1.205 | .237 | 1.055 |
| CDR | .211 | 1.221 | .230 | 1.096 |
| NPLR | -3.589 | -4.618 | .000 | 1.057 |
| LEV | 1.320 | 4.104 | .000 | 1.936 |
| LSIZE | -9.330 | -5.396 | .000 | 1.943 |

Source: Appendix- V

ROE = 27.527 + 0.161CRR + 0.211CDR – 3.589NPLR + 01.320LEV – 9.330LSIZE

Table 15 presents the regression coefficients for the independent variables cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio, and bank size along with the intercept for the dependent variable ROE. The VIF values for all independent variables are below 10, indicating that there is no multicollinearity in the model.

The regression model findings reveal a positive correlation between ROE and the cash reserve ratio (CRR), with a coefficient estimate of 0.161. This implies that a 1 percent increase in the cash reserve ratio results in a 0.161 percent increase in the development banks' return on equity (ROE), assuming other factors remain constant. However, with a p-value of 0.237, this effect is statistically insignificant at the five percent significance level. Therefore, the cash reserve ratio has an insignificant positive impact on the ROE of the sample development banks.

The regression analysis shows a positive correlation between ROE and the credit to deposit ratio (CDR), with a coefficient estimate of 0.211. This means that a 1 percent increase in CDR leads to a 0.211 percent increase in the development banks' ROE, assuming other variables are held constant. However, the p-value of 0.230 indicates that this effect is statistically insignificant at the five percent significance level. Therefore, the credit to deposit ratio has an insignificant positive impact on the ROE of the sample banks.

The regression results show a negative relationship between ROE and the non-performing loan ratio (NPLR), with a coefficient estimate of -3.589. This means that a 1 percent increase in NPLR leads to a 3.589 percent decrease in the development

banks' return on equity (ROE), assuming other variables remain constant. The p-value of 0.000 indicates that this effect is statistically significant at the five percent significance level. Thus, the non-performing loan ratio has a statistically significant negative impact on the ROE of the sample banks.

The regression analysis reveals a positive relationship between ROE and the leverage ratio (LEV), with a coefficient estimate of 1.320. This indicates that a 1 percent increase in the leverage ratio results in a 1.320 percent increase in the development banks' return on equity (ROE), assuming other variables are held constant. The p-value of 0.000 shows that this effect is statistically significant at the five percent significance level. Thus, the results support the hypothesis that the leverage ratio has a statistically significant positive impact on the ROE of banks.

The regression model results show a negative relationship between ROE and bank size (LogSize), with a coefficient estimate of -9.330. This implies that a 1 percent increase in bank size leads to a 9.330 percent decrease in the development banks' ROE, assuming other variables remain constant. The p-value of 0.000 indicates that this effect is statistically significant at the five percent significance level. Therefore, bank size (LogSize) has a significant negative impact on the ROE of the banks.

### 4.2 Discussion

The primary objective of the research is to evaluate credit management and its impact on the profitability of development banks in Nepal. Credit risk directly affects return on assets (ROA) and return on equity (ROE), which are key indicators of profitability for these banks. The study found that the cash reserve ratio has an insignificant positive relationship with ROA, aligning with the findings of Bhattarai (2016) and Al Zaidanin and Al Zaidanin (2021), who also reported an insignificant relationship between the cash reserve ratio and ROA. However, this contrasts with Shrestha (2017). Similarly, the cash reserve ratio has an insignificant positive relationship with ROE, consistent with Al Zaidanin and Al Zaidanin (2021) but inconsistent with Shrestha (2017). The study also found an insignificant negative correlation between the credit to deposit ratio (CDR) and ROA, which aligns with the findings of Shrestha and Niroula (2021). Additionally, there is an insignificant positive relationship between CDR and ROE, which contrasts with the findings of Kawor and Atinyo

(2022). Furthermore, the non-performing loan ratio (NPLR) shows a significant negative relationship with both ROA and ROE, consistent with Shrestha (2017), who observed a significant negative relationship between NPLR and ROA. However, this finding contradicts the results of Bhattarai (2016) and Biswas, Nath, Biswas, and Rashid (2021). The leverage ratio (LEV) has a significant negative relationship with ROA, which agrees with Shrestha (2017), but an insignificant positive relationship with ROE, consistent with Maharjan et al. (2016). Finally, bank size has a significant negative relationship with both ROA and ROE, which is in line with Poudel (2018). This finding contrasts with Bhattarai (2016), who reported a positive association between bank size and ROA.

The regression analysis reveals that the cash reserve ratio (CRR) has an insignificant positive impact on ROA for banks. This finding aligns with Bhattarai (2016), Biswas et al. (2021), and Ayim and Agyemang (2021), who also observed an insignificant positive impact of CRR on ROA. However, it contrasts with the findings of Shrestha (2017) and Shrestha (2022). Similarly, the credit to deposit ratio (CDR) shows an insignificant positive impact on ROA for development banks in Nepal. This result is consistent with Risal and Poudel (2020) and Yeasin (2022). In contrast, it contradicts the findings of Maharjan et al. (2016) and Shrestha and Niroula (2021), who reported a negative effect of the loan to deposit ratio on the profitability (ROA) of development banks. The study found that the non-performing loan ratio (NPLR) has a negative and significant impact on ROA in Nepalese development banks. This finding is consistent with Bhattarai (2016), Maharjan et al. (2016), Munangi and Sibindi (2020), and Al Zaidanin and Al Zaidanin (2021), who also reported a negative effect of NPLR on ROA. However, it contradicts Annor and Obeng (2017), who found a positive and significant impact of NPLR on ROA. Additionally, the leverage ratio has a statistically insignificant negative effect on ROA, which aligns with Shrestha (2017) and Shah and Vongbusin (2019). This result is not consistent with the findings of Munangi and Sibindi (2020) and Ayim and Agyemang (2021). The study also found a significant negative effect of bank size (LogSize) on ROA. This is similar to the findings of Otieno and Nyagol (2016) and Biswas et al. (2021), who observed that bank size negatively impacts ROA. However, this contradicts Bhattarai (2016), who concluded that bank size had a positive impact on ROA.

The regression analysis indicates that the cash reserve ratio (CRR) has an insignificant positive effect on ROE for banks. This finding is consistent with Biswas et al. (2021) and Ayim and Agyemang (2021), who also reported an insignificant positive impact of CRR on bank profitability. However, it contrasts with Shrestha (2017) and Shrestha (2022), who found a negative and significant effect of CRR on ROE. Similarly, the credit to deposit ratio (CDR) has an insignificant positive impact on ROE, which aligns with the findings of Risal and Poudel (2021). This result, however, contradicts Maharjan et al. (2016), who reported a negative impact of CDR on ROE. The non-performing loan ratio (NPLR) shows a negative and statistically significant impact on ROE. This finding is consistent with Al-Eitan and Bani-Khalid (2019), Poudel (2018), Nelson (2020), and Dunyoh, Ankamah, and Kosipa (2022). However, it contrasts with Munangi and Sibindi (2020), who found a positive effect of NPLR on ROE. The study found that the leverage ratio has a statistically significant positive effect on ROE, which aligns with Munangi and Sibindi (2020). However, this finding is contrary to Shrestha (2017), who reported a different effect. Finally, the effect of bank size (LogSize) on ROE is significantly negative. This is consistent with Otieno and Nyagol (2016), who observed a negative impact of bank size on ROE. However, it contradicts the findings of Al-Eitan and Bani-Khalid (2019) and Munangi and Sibindi (2020), who reported a positive or insignificant impact of bank size on ROE.

# CHAPTER - V

## SUMMARY AND CONCLUSION

### 5.1 Summary

Credit risk plays a crucial role in a company's growth and profitability, especially for financial institutions. Despite significant efforts by development banks, credit risk remains a pressing issue due to increasing marginal losses from borrower defaults. Effective credit risk management is critical as it helps mitigate these risks and aims to optimize the risk-adjusted rate of return. Development banks must manage both the risk associated with individual credits and the overall credit risk within their portfolios. However, challenges such as failure to fulfill duties, insufficient oversight, and a high rate of defaulters persist. To enhance profitability through efficient credit risk management, it is essential to examine how various aspects of credit risk impact financial performance. Consequently, this study aims to explore the effect of credit risk on the profitability of development banks in Nepal.

The primary objective of the research is to investigate credit management and its impact on the profitability of development banks in Nepal. The specific objectives include assessing the current status of credit risk and profitability in development banks in Nepal, analyzing the relationship between credit risk and profitability in these banks and examining the impact of credit risk on the profitability of development banks in Nepal. The study employs both descriptive and causal research designs. The descriptive research design is used to analyze credit risk and profitability, providing insights into the current state of the banks through metrics such as average values, standard deviations, maximum, and minimum values, which describe the characteristics of the data. The causal research design is used to explore the effect of credit risk on the profitability of development banks, helping to understand the cause-and-effect relationships in the study. Currently, there are 16 development banks operating in Nepal, which constitute the population for this study. From this population, four development banks Shangri-La Development Bank Limited, Jyoti Bikas Bank Limited, Muktinath Bikas Bank Limited, and Kamana Sewa Bikas Bank Limited have been selected as the sample using purposive sampling. These banks were chosen because they are the top four in

terms of profitability and management of non-performing loans. The study relies on secondary data obtained from the annual reports of these development banks over a ten-year period (2012/13 to 2021/22). To analyze the data, the study employs descriptive analysis, correlation analysis, and multiple regression using SPSS version 26. In the analysis, return on assets (ROA) and return on equity (ROE) are used as dependent variables, while the independent variables include cash reserve ratio, credit to deposit ratio, non-performing loan ratio, leverage ratio, and bank size.

In summary, this study found that Nepalese development banks generally exhibit low credit risk, as indicated by their non-performing loan ratios, and maintain a strong profitability position. The correlation analysis shows that cash reserve ratio (CRR) has an insignificant positive relationship with profitability. Credit to deposit ratio (CDR) shows an insignificant negative relationship with ROA and an insignificant positive association with ROE and non-performing loan ratio (NPLR) and bank size both have significant negative relationships with profitability. Furthermore, the leverage ratio has a significant negative relationship with ROA but an insignificant positive relationship with ROE. Regression analysis also shows that cash reserve ratio (CRR) and credit to deposit ratio (CDR) both have an insignificant positive effect on profitability (ROA and ROE). Non-performing loan ratio (NPLR) and bank size have a significant negative impact on profitability. Leverage ratio (LEV) shows an insignificant negative impact on ROA but a significant positive impact on ROE. Therefore, the study concludes that credit risk has a significant negative impact on the profitability of Nepalese development banks.

### 5.2 Conclusions

This study concludes that KSBBL has a strong liquidity position and efficiently manages its day-to-day operations. Its high credit to deposit ratio indicates that KSBBL effectively mobilizes its deposits into loans and advances, leading to significant profitability. In terms of credit risk, MNBBL stands out for maintaining the lowest non-performing loan ratio among the banks studied, demonstrating superior credit risk management. Additionally, MNBBL has a substantial proportion of financing from creditors relative to its owners. Regarding profitability, MNBBL excels with the highest return on assets (ROA) among the banks, indicating effective

overall operations and optimal asset utilization. MNBBL also shows the most effective management in generating profit, as evidenced by its highest return on equity (ROE). This suggests that MNBBL is not only generating more income but also displaying progressive performance compared to its peers.

The correlation analysis concluded that cash reserve ratio (CRR) has insignificant positive relation with profitability (ROA and ROE). Then, credit to deposit ratio has insignificant negative relationship with ROA and insignificant positive association with ROE of the development banks. However, non-performing loan and bank size have significant negative relationship with profitability (ROA and ROE). Moreover, leverage ratio has significant negative relationship with ROA but it has insignificant positive relationship with ROE of the development banks.

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

### 5.3 Implications

The investigation has led to the following conclusions about how credit risk may have a greater influence on the financial success of the Nepalese development banks.

- This study draws some conclusions and identifies the effect of credit risk indicators such as non-performing loan ratio, leverage ratio and bank size on profitability significantly. Thus, this findings and information gives signal to the management of the development banks and policy makers or regulators to formulate strategies that will not only minimize the exposure of the banks to credit risk but will enhance profitability.
- According to the study, effective credit risk management benefits not only development banks but also individuals, businesses, and the overall economy. By considering various credit risk variables and their impact on development banks' profitability, such management practices contribute to the broader

prosperity of the financial industry and the community. This, in turn, supports economic growth and stability.

- The study encourages development bank management to review their past actions and offers guidance for future plans and initiatives. It provides current information, statistics, and insights into credit risk challenges. Consequently, bankers, shareholders, depositors, as well as future scholars and students, will find this study valuable.
- The study also offers expertise in credit risk management and a clear conceptual framework, making it a useful resource for future researchers.

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# APPENDICES

## APPENDIX – I

### Data of Sample Development Banks

| Banks | Year | SIZE | NPLR | ROA | ROE | CRR | CDR | LEV |
|---|---|---|---|---|---|---|---|---|
| JBBL | 2012/13 | 4901.93 | 3.31 | 1.43 | 8.28 | 5.54 | 83.95 | 4.79 |
| | 2013/14 | 6194.76 | 2.67 | 1.01 | 6.94 | 4.57 | 80.65 | 5.83 |
| | 2014/15 | 7423.09 | 1.98 | 1.39 | 10.24 | 5.28 | 78.27 | 6.38 |
| | 2015/16 | 8917.85 | 1.39 | 1.70 | 13.13 | 5.36 | 76.74 | 6.71 |
| | 2016/17 | 13188.43 | 0.96 | 1.73 | 8.95 | 5.35 | 85.36 | 4.17 |
| | 2017/18 | 23401.93 | 0.4 | 1.48 | 10.99 | 5.16 | 79.90 | 6.43 |
| | 2018/19 | 36459.94 | 0.54 | 1.46 | 13.26 | 4.32 | 84.24 | 8.10 |
| | 2019/20 | 42361.10 | 0.92 | 1.15 | 10.84 | 3.74 | 82.46 | 8.40 |
| | 2020/21 | 59879.02 | 0.84 | 1.11 | 12.66 | 3.1 | 86.11 | 10.41 |
| | 2021/22 | 71407.87 | 1.47 | 0.94 | 11.89 | 3.23 | 89.00 | 11.67 |
| MNBBL | 2012/13 | 4423.20 | 0.59 | 2.22 | 24.60 | 8.06 | 81.86 | 10.10 |
| | 2013/14 | 6029.44 | 0.45 | 2.52 | 25.17 | 6.64 | 84.22 | 8.99 |
| | 2014/15 | 9000.47 | 0.19 | 2.42 | 22.39 | 7.95 | 85.14 | 8.26 |
| | 2015/16 | 12936.75 | 0.09 | 2.79 | 26.88 | 8.49 | 86.89 | 8.62 |
| | 2016/17 | 19592.34 | 0.02 | 2.49 | 21.27 | 9.74 | 90.37 | 7.56 |
| | 2017/18 | 34766.24 | 0.004 | 1.79 | 17.21 | 5.34 | 82.07 | 8.59 |
| | 2018/19 | 51991.40 | 0.07 | 1.65 | 19.24 | 6.49 | 81.55 | 10.68 |
| | 2019/20 | 66348.09 | 0.46 | 1.07 | 12.16 | 7.58 | 80.93 | 10.40 |
| | 2020/21 | 101131.72 | 0.23 | 1.14 | 16.93 | 4.72 | 82.76 | 13.80 |
| | 2021/22 | 121083.27 | 0.21 | 1.11 | 16.61 | 4.59 | 82.58 | 13.99 |
| KSBBL | 2012/13 | 2399.72 | 0.19 | 2.08 | 19.29 | 7.6 | 85.09 | 8.26 |
| | 2013/14 | 3025.38 | 0.16 | 2.09 | 19.78 | 5.02 | 77.83 | 8.45 |
| | 2014/15 | 2588.70 | 0.29 | 3.14 | 20.43 | 5.33 | 80.42 | 5.50 |
| | 2015/16 | 5504.55 | 1.03 | 1.97 | 18.49 | 5.44 | 84.88 | 8.40 |
| | 2016/17 | 6997.61 | 1.39 | 1.82 | 10.70 | 5.44 | 93.23 | 4.87 |
| | 2017/18 | 19459.67 | 1.13 | 1.99 | 12.22 | 24.25 | 84.26 | 5.15 |
| | 2018/19 | 26691.89 | 0.97 | 1.07 | 8.77 | 21.76 | 88.15 | 7.22 |
| | 2019/20 | 36621.71 | 1.79 | 0.33 | 3.74 | 8.45 | 81.60 | 10.43 |
| | 2020/21 | 51304.90 | 1.61 | 1.17 | 15.58 | 11.79 | 87.26 | 12.37 |
| | 2021/22 | 59352.25 | 2.45 | 1.06 | 14.34 | 12.34 | 87.59 | 12.49 |
| SADBL | 2012/13 | 2530.16 | 2.17 | 3.25 | 22.24 | 17.01 | 77.31 | 5.85 |
| | 2013/14 | 7462.21 | 0.68 | 0.99 | 8.68 | 11.23 | 79.66 | 7.75 |
| | 2014/15 | 9167.55 | 0.6 | 1.94 | 17.27 | 9.81 | 80.45 | 7.89 |
| | 2015/16 | 11959.42 | 0.65 | 1.80 | 15.95 | 9.71 | 87.10 | 7.86 |
| | 2016/17 | 16043.81 | 0.6 | 2.17 | 20.39 | 11.52 | 83.02 | 8.41 |
| | 2017/18 | 21270.66 | 1.62 | 1.43 | 9.75 | 7.21 | 81.96 | 5.79 |
| | 2018/19 | 26283.65 | 0.8 | 1.30 | 10.25 | 5.97 | 86.11 | 6.88 |
| | 2019/20 | 32898.33 | 1.13 | 0.58 | 5.78 | 7.17 | 81.58 | 8.95 |
| | 2020/21 | 47836.88 | 1.39 | 0.86 | 11.05 | 5.15 | 84.45 | 11.89 |
| | 2021/22 | 59578.99 | 0.98 | 1.00 | 13.98 | 6.16 | 83.87 | 12.98 |

Source: Annual Reports of Sample Development Banks

## APPENDIX -V

### Descriptive Analysis

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| CRR | 40 | 3.10 | 24.25 | 7.8402 | 4.54316 |
| CDR | 40 | 76.74 | 93.23 | 83.5218 | 3.58695 |
| NPLR | 40 | .004 | 3.31 | .9606 | .78324 |
| LEV | 40 | 4.17 | 13.99 | 8.5317 | 2.56028 |
| LSIZE | 40 | 3.38 | 5.08 | 4.2357 | .47711 |
| ROA | 40 | .33 | 3.25 | 1.6160 | .66841 |
| ROE | 40 | 3.74 | 26.88 | 14.7080 | 5.64704 |
| Valid N (listwise) | 40 | | | | |

Source: SPSS version 26

## APPENDIX -VI

### Pearson Correlation Coefficients

| | | CRR | CDR | NPLR | LEV | LSIZE | ROA | ROE |
|---|---|---|---|---|---|---|---|---|
| CRR | Pearson Correlation | 1 | .099 | .108 | -.180 | -.096 | .189 | .057 |
| | Sig. (2-tailed) | | .542 | .508 | .265 | .554 | .242 | .725 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| CDR | Pearson Correlation | .099 | 1 | -.031 | .109 | .258 | -.049 | .024 |
| | Sig. (2-tailed) | .542 | | .847 | .504 | .108 | .764 | .882 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| NPLR | Pearson Correlation | .108 | -.031 | 1 | -.213 | -.100 | -.329* | -.536** |
| | Sig. (2-tailed) | .508 | .847 | | .187 | .538 | .038 | .000 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| LEV | Pearson Correlation | -.180 | .109 | -.213 | 1 | .670** | -.416** | .168 |
| | Sig. (2-tailed) | .265 | .504 | .187 | | .000 | .008 | .301 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| LSIZE | Pearson Correlation | -.096 | .258 | -.100 | .670** | 1 | -.663** | -.315* |
| | Sig. (2-tailed) | .554 | .108 | .538 | .000 | | .000 | .047 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| ROA | Pearson Correlation | .189 | -.049 | -.329* | -.416** | -.663** | 1 | .803** |
| | Sig. (2-tailed) | .242 | .764 | .038 | .008 | .000 | | .000 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| ROE | Pearson Correlation | .057 | .024 | -.536** | .168 | -.315* | .803** | 1 |
| | Sig. (2-tailed) | .725 | .882 | .000 | .301 | .047 | .000 | |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 |

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS version 26

## APPENDIX -VII

## Multiple Regression Analysis of Sample Banks (On ROA)

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .797[a] | .636 | .582 | .43198 |

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

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 11.080 | 5 | 2.216 | 11.875 | .000[b] |
| | Residual | 6.345 | 34 | .187 | | |
| | Total | 17.424 | 39 | | | |

a. Dependent Variable: ROA
b. Predictors: (Constant), LSIZE, CRR, NPLR, CDR, LEV

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. | Tolerance | VIF |
| 1 | (Constant) | 4.346 | 1.635 | | 2.658 | .012 | | |
| | CRR | .022 | .016 | .153 | 1.436 | .160 | .948 | 1.055 |
| | CDR | .020 | .020 | .107 | .990 | .329 | .912 | 1.096 |
| | NPLR | -.355 | .091 | -.416 | -3.909 | .000 | .946 | 1.057 |
| | LEV | -.004 | .038 | -.014 | -.097 | .923 | .516 | 1.936 |
| | LSIZE | -.992 | .202 | -.708 | -4.910 | .000 | .515 | 1.943 |

a. Dependent Variable: ROA

Source: SPSS version 26

## APPENDIX -VIII

## Multiple Regression Analysis of Sample Banks (On ROE)

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .792[a] | .627 | .572 | 3.69620 |

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

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 779.171 | 5 | 155.834 | 11.407 | .000[b] |
| | Residual | 464.503 | 34 | 13.662 | | |
| | Total | 1243.674 | 39 | | | |

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

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | 27.527 | 13.991 | | 1.968 | .057 | | |
| | CRR | .161 | .134 | .130 | 1.205 | .237 | .948 | 1.055 |
| | CDR | .211 | .173 | .134 | 1.221 | .230 | .912 | 1.096 |
| | NPLR | -3.589 | .777 | -.498 | -4.618 | .000 | .946 | 1.057 |
| | LEV | 1.320 | .322 | .599 | 4.104 | .000 | .516 | 1.936 |
| | LSIZE | -9.330 | 1.729 | -.788 | -5.396 | .000 | .515 | 1.943 |

a. Dependent Variable: ROE

Source: SPSS version 26

# CREDIT MANAGEMENT AND ITS IMPACT ON PROFITABILI...

**By: Dil Kumari Gurung**

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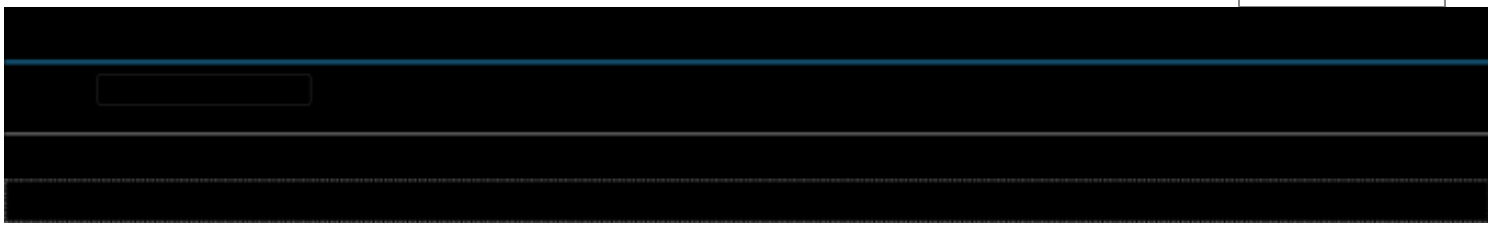

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**ABSTRACT This study** examines **the impact of credit** management **on** the **pro tability of** Nepalese development **banks. Secondary data was** collected **from** these **banks** over a **ten-year** period ( **2012/13–2021/22**

). The data was analyzed using correlation and multiple regression analysis. The study nds that Nepalese development banks exhibit low credit risk, as indicated by a low non-performing loan ratio, and they maintain a strong pro tability position.

**The correlation test** indicates **that** the **cash reserve ratio has** an **insigni cant** positive relationship **with**

pro tability. The credit-to-deposit ratio shows an insigni cant negative relationship with Return on Assets (ROA) and an insigni cant positive association with Return on Equity (ROE). In contrast, non- performing loans and bank size have a signi cant negative relationship with pro tability. Additionally, the leverage ratio has a signi cant negative relationship with ROA but an insigni cant positive relationship with ROE. The regression analysis con rms that both the cash reserve ratio and the credit-to-deposit ratio have an insigni cant positive effect on pro tability (ROA and ROE). However,