

CREDIT RISK AND PROFITABILITY OF COMMERCIAL BANKS

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

by

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CERTIFICATION OF AUTHORSHIP

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

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

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June, 2024

REPORT OF RESEARCH COMMITTEE

Mr. Arun Shrees has defended research proposal entitled “**Credit Risk and Profitability of Commercial Banks**” successfully. The research committee has registered the dissertation for further progress. It is recommended to carry out the work as per suggestions and guidance of supervisor Jhabindra Pokharel and submit the thesis for evaluation and viva-voce examination.

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We, the undersigned, have examined the thesis entitled “**Credit Risk and Profitability of Commercial Banks**” presented by Arun Shrees a candidate for the degree of Master of Business Studies (MBS Semester) and conducted the Vice voce examination of the candidate. We hereby certify that the thesis is worthy of acceptance.

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ACKNOWLEDGEMENT

This study entitled "Credit Risk and Profitability of Commercial Banks" has been conducted for the partial requirement for the degree of Masters of Business Studies (MBS) of Tribhuvan University. Every project whether big or small is the successful largely due to the effort of a number of wonderful people who have always given their valuable advice or lent a helping hand. I sincerely appreciate the inspiration; support and guidance of all those people who have been instrumental in making this study a success.

My foremost appreciation and thanks goes to my honorable Supervisor, Jhabindra Pokharel for his close supervision and professional advice and encouragement during the research work. I am highly indebted and very thankful for his continuous support and constructive suggestions that have enabled this research project to achieve its present form. Moreover, I am also indebted and thankful to him for his patience, motivation, support, instruction and immense knowledge in completing my overall MBS degree. I could not have imagined having a better advisor and mentor for my thesis.

I would like to express cordial gratitude to Asso. Prof. Dr. Sajeeb Kumar Shrestha (Chairperson, Research Committee) and Asso. Prof. Dr. Krishna Prasad Acharya (Campus chief) for timely supervision and guidance to complete this work. I also highly appreciate the efforts of all teacher and other members of central department of management, libraries staffs who inspired and provided the needed materials to complete this thesis.

Last but not least, I would like to thank my family members, for their effort, cooperate in every step of thesis, advice and other friends for their affection and emotional support that has inspired me to achieve every success including this study. I would also like to take full responsibility of any kind of deficiency presented in this thesis.

Arun Shrees

TABLE OF CONTENTS

	Page No.
<i>Title page</i>	<i>I</i>
<i>Certificate of Authorship</i>	<i>ii</i>
<i>Report of Research Committee</i>	<i>iii</i>
<i>Approval Sheet</i>	<i>iv</i>
<i>Acknowledgements</i>	<i>v</i>
<i>Table of Contents</i>	<i>vi</i>
<i>List of Tables</i>	<i>viii</i>
<i>List of Figure</i>	<i>ix</i>
<i>Abbreviations</i>	<i>x</i>
<i>Abstract</i>	<i>xi</i>

CHAPTER-I INTRODUCTION

1.1 Background of the Study	1
1.2 Problem Statement	3
1.3 Objectives of the study	6
1.4 Rationale of the Study	6
1.5 Limitations of the study	7

CHAPTER II LITERATURE REVIEW

2.1 Theoretical review	8
2.2 Empirical Review	13
2.3 Research Gap	26

CHAPTER-III RESEARCH METHODOLOGY

3.1 Research Design	27
3.2 Population and Sampling	27
3.3 Nature and Sources of Data Collection	28
3.4 Data Collection Procedure	28
3.5 Methods of Analysis	28
3.6 Research Framework and Definition of Variables	32

CHAPTER-IV RESULTS AND DISCUSSION

4.1 Results	38
4.1.1 Pattern analysis of variable	38
4.1.2 Descriptive Statistics	47
4.1.3 Correlation analysis	48
4.2 Regression analysis	50
4.3 Discussion	57

CHAPTER V SUMMARY AND CONCLUSION

5.1 Summary	59
5.2 Conclusion	60
5.3 Implications	60

References

LIST OF TABLES

	Page No.
Table 1 Meta Table	21
Table 2 Variables Descriptive	29
Table 3 Return on Equity	38
Table 4 Capital adequacy ratio (CAR)	39
Table 5 Non performing loan (NPL)	40
Table 6 Loan and advance to total deposit	41
Table 7 Interest spread ratio	42
Table 8 Return on assets (ROA)	43
Table 9 Cost per loan	44
Table 10 Solvency ratio	45
Table 11 Net interest margin	46
Table 12 Descriptive Statistics	47
Table 13 Correlation coefficient	48
Table 14 Test for OLS model, fixed effect model, Random method ROA	51
Table 15 Result of fixed effect model	51
Table 16 Test for OLS model, fixed effect model, Random method ROE	53
Table 17 Result of Random effect model	53
Table 18 Test for OLS model, fixed effect model, Random method NIM	55
Table 19 Result of Random effect model with NIM.	55

LIST OF FIGURE

Page No.

Figure 1 Research Framework	33
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ABBREVIATIONS

ADBL	Apicultural Development Bank Limited
AGR	Assets Growth Ratio
CAR	Capital Adequacy Ratio
CAR	Capital Adequacy Ratio
CD	Credit to Deposit Ratio
CV	Coefficient Of Variation
EBL	Everest Bank Limited
FY	Fiscal Year
HBL	Himalayan bank Limited
INT_ SPRE	Interest Spread Rate
KBL	Kumari Bank Limited
L_A	Loan Advance
MBL	Machhapuchhre Bank Limited
NICA	NIC Asia Bank Limited
NIM	Net Interest Margin
NMB	Nepal Merchant Bank Limited
NPL	Non-Performing Loan Ratio
PCBL	Prime Commercial bank Limited
r	Correlation
RBBL	Rastriya Banijaya Bank Limited
ROA	Return on Assets
ROE	Return on Equity
SCBNL	Standard chartered Bank Nepal Limited
SD	Standard Deviation
SOL	Solvency Ratio

ABSTRACT

Banking sectors is important sector in an economy; it works as smooth running of economy. But there are various investors are interesting to invest in common stock of banks. The market price of stock affects investment of investors. This study is conducted on impact of firm-specific and macroeconomic determinants of common stock price of sample bank. The main objectives of study are to identify the factors that affect to credit risk of commercial banks in Nepal. The study has been conducted on Descriptive and Causal comparative research design with sample size of 10 commercial bank over the period of 2014 to 2022 leading to total 90 observations. Secondary source of data are used for in study with random sampling method. The panel data analysis is used. Different statistical tools i.e., correlation and regression analysis have been used to analyze the data of sample development banks. In the study three type of regression are used. They are OLS, Fixed effect and Random effect model. To test these models, two test are applied i.e., Redundant fixed effect test and Hausman test. From the test, Random effect model is appropriate for NIM and ROE. fixed effect model is appropriate for ROA. The major finding of the study shows that earning per share (EPS) influence the investment in development banking common stock. This study suggest to investors, banks and further researchers.

Keywords: *Return on assets (ROA), Return on equity (ROE), Leverage, Panel Data, commercial Banks*

CHAPTER-I

INTRODUCTION

1.1 Background of the Study

Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of the risk to a greater extent than any other risk. It is a risk of financial loss if a borrower or counterparty fails to honor commitments under an agreement and any such failure has an adverse effect on financial performance of the bank.

Credit risk is a when a lender lend money to a borrowed but may not be payback (Peterdy 2022) . It refers to the risk of default or non-payment or non-adherence to contractual obligations by a borrower. Credit risk mainly arises when borrowers are unable to pay due willingly or unwillingly. The revenue of banks comes primarily from interest on loans and accordingly, loans form a major source of credit risk (Bandyopadhyay 2016) . Banks face credit risks from financial instruments such as acceptances, interbank transactions, trade financing, foreign exchange transactions, futures, swaps, bonds, options, settlement of transactions, and others. The loss may be complete or partial. In an efficient market, higher levels of credit risk will be associated with higher borrowing costs. Because of this, measure of borrowing costs such as yield spreads can be used to infer credit risk levels based on assessment by market participants. To reduce the lender's credit risk, the lender may perform a credit check on the prospective borrower, may require the borrower to take out appropriate insurance such as mortgage insurance, or seek security over some assets of the borrower or a guarantee from the third party. The lender can also take out insurance against the risk or on-sell the debt to another company. In general, the higher the risk, the higher will be the interest rate that the debtor will be asked to pay on the debt.

Profitability is composed of two words namely, profit and ability. The term profit has been explained above and the term ability indicates the power of a business entry to earn profits. The ability of a concern also denotes its earning power or operating performance. The profitability may be defined as the ability of a given investment to earn a return from its use (Chhetri 2021). Profitability is a relative concept whereas profit is an absolute connotation. Profitability is ability of a company to use its resources to generate revenues

in excess of its expenses. In other words, this is a company's capability of generating profits from its operations. Despite being closely related to and mutually interdependent profit and profitability are two different concepts. In other words, in spite of their generic nature, eachone of them has a distinct role in business. As an absolute them, profit has no relevance tocompare the efficiency of a business organization. A very high profit does not always indicate sound organizational efficiency and low profitability is not always a sign of organizational sicknes.

Therefore, it can be said that profit is not the prime variable on the basis of which the operational efficiency and financial efficiency and financial efficiency of an organization can be compared. Profitability refers to the bank ability to generate earnings in comparison to its expenses and incurred cost during a specific period of time (Tuladhar, 2017).

The profitability of the commercial banks is measured in terms of return on equity and is regressed on bank specific variables such as non-performing loan (NPL), solvency ratio, capital adequacy ratio and loan and advances. The study reveals that non-performing loan ratio has the significant negative impact on profitability of commercial banks. In addition, solvency ratio and interest spread rate have the significant negative impact on profitability. In contrast, capital adequacy ratio, and total assets have the significant positive impact on profitability of commercial banks (Poudel, 2018).

Bank needs to manage the credit risk inherent in the entire portfolio as well as the risk in individual credit or transaction. Proper administrative activities of credit are basic necessary for banking sector for removing overall complexity of investment portfolio. A strong credit risk management avoids significant drawbacks and increases financial performance of banks. Good financial performance rewards employees as well as shareholders for their working environment and investment respectively. This will encourage motivating for employees as well as shareholders for additional contribution that brings economic growth. Therefore, effective management of credit risk is very important component to achieve long term success of the banking organization.

1.2 Problem Statement

There are new trends of expansion, operations and establishments of banking and financial institutions that help to grow the banking industries in Nepal. Recently, the regulator has added some changes in policies to grow the financial sectors that concerns of merger and acquisition, upgrade, opening branches in remote areas. There are some unique environments and activities of banks in daily operations. Some of banks are busy to launch new deposit products in high interest rate, some of them are trying to catch attention of customers by reducing interest rate on loan. So, there is tough competition in the entire banking industries in Nepal.

Most of the banking business is so delicate because more than 85% of their liability is deposits from customers (Saunders and Cornett, 2011). Bank creates loan from those deposits that deposited by customers and those loans are the major income generating source of bank. However, the action is associated with enormous risk to both banks and customers. With the aim of increasing revenue and gaining a large portion of the market share, bank provides loan and advance which could not be recovered lending by huge growing non-performing loan. This has become stress situation for bank and other stakeholders. In order to control such type of condition, the regulatory body of the bank and financial institution (Nepal Rastra Bank) have directed of the credit loss provision.

Recently, many studies have focused on examining the effect of credit risk on bank profitability and found contradictory results in global context. Hosna (2009) found a positive relationship between credit risk and profitability on commercial banks in Sweden. Similarly Boahene . (2012) confirmed a significant positive impact of non-performing loan on profitability of commercial banks in Ghana. In contrast, Kolapo et al. (2012) found a negative relationship between credit risk and the bank profitability in Nigerian commercial banks. In the same way, Sheeba (2017) showed a significant, negative impact of credit risk on profitability of commercial banks in India. Pastory (2013) examined the negative impact of credit risk on profitability in Tanzanian commercial banks. Whereas, Kithinji (2010) confirmed that the bulk of the profits of commercial banks are not influenced by the amount of credit and non-performing loans whereas, other variables other than credit and non-performing loans impact on profits.

Although, credit risk is the most influencing factor on bank profitability, empirical evidences have confirmed that there are so many other factors that affect banks' profitability. Haslem (1968) identified that bank management, time, location, and size influence on banks' profitability. Berger (1995) found a strong positive relationship between capital adequacy ratio and profitability of US banks. However, the study further considered the relationship should be negative under certain situations. Collins and Preston (1969) showed a positive association between firm size and profitability and it stems from implementing greater differentiation and specialization strategies and should therefore lead to higher efficiency. Contrarily, Bohnsack (2007) examined the negative significant relationship between profitability and the volume of assets. In the same way, Kosimodou. (2005) concluded that, small banks showed higher performance in comparison to large ones. Regarding the liquidity, Ali (2016) examined a significant positive relationship of liquidity with profitability of the commercial banks. On the other hand, Abdullah and Jahan (2014) revealed that there is no significant relationship between liquidity and profitability.

The risks that are most applicable to banks are: credit risk, interest rate risk, liquidity risk, market risk, foreign exchange risk and solvency risk. Nepal is not effective to impose fine and penalties as per necessary because of corruption, unnecessary outside pressure, lack of information etc. At present Nepalese commercial banks do not seem to be capable to invest in less risky and liquid sector such as Treasury Bills or Government Securities.

Leverage is the use of borrowed funds or financial instrument to increase the potential return on an investment . It involves using debt or other financial tools to amplify the effect of an investment's performance .leverage can enhance potential profits, but it is also increase the potential risk of losses.

The relationship between leverage and profitability can vary depending on a range of factors including the industry economic condition and specific financial structure of a company. Olalere (2013), Wan Ahmad Wan Omar² credit risk indicators (total debt to total asset ratio) is negatively insignificant with ROE. Kutum(2016) Reveled that there is positive relation between leverage and profitability in Palestine exchange.

Liquidity is a ability of a bank to meet its short-term financial obligation and demands for cash without causing significant disruption to its normal operation. It represent the bank's ability to convert its assets into cash quickly and efficiently. There is negative relationship between profitability and liquidity (CD ratio,CRR,) . (2019) Cheng, CRR and profitability had a negative association with bank profitability of the companies in ghana . Biswas1(2021), CRR has significant positive effect on the CB' profitability.

Bagale (2023), The analysis revealed that capital adequacy ratio (CAR) has negative impact on ROE of Nepalese commercial bank.

Cost per loan refers to the average cost incurred by a lender or financial institution to process and administer a single loan. the cost per loan includes various expenses and operation cost that are incurred during the loan origination and servicing process. (2019) Cheng Li (cost per loan assets)shows a positive coefficient with ROA. Biswas (2021), The study results showed a significant positive relationship between ROA and CAR as well as CLA.

Capital adequacy is the financial health and stability of a financial institute ,such as a banks in relation to the amount of capital it hold in comparison to its risk exposure. In other word ,it measures the extent to which a financial institute's capital is sufficient to absorb potential losses and withstand adverse economic condition without jeopardizing its solvency or ability to meet its financial obligation. there is negative relationship between capital adequacy and profitability because more capital adequacy hold bank they have less amount to lending Thapa(2023), the study found that capital adequacy ratio have a significant negative impact on profitability. Bono(2020) capital adequacy ratio (CAR) positive effect on profitability Noman(2015), The effect of CAR is found negative and significant on ROA.

Interest spread rate also known as the net interest spread or simply the interest spread ,refers to the difference between the interest rate a financial institute earns on its assets (such as loans and investment)and interest rate pays on its liabilities (such as deposits and borrowing) .it is a key indicators of a bank's or other financial institute's profitability and its ability to generate earning from its core lending and borrowing activities. Poudel(2018) ,interbank interest rate has insignificant positive impact on profitability.

Karki (2075) When interest rate spread increases, it will lead to increase profitability, i.e. increase in return on equity, return on assets and vice versa. The study concluded that there is optimistic and direct relationship between interest rate spread and bank's profitability.

The risks that are most applicable to banks are: credit risk, interest rate risk, liquidity risk, market risk, foreign exchange risk and solvency risk. Nepal is not effective to impose fine and penalties as per necessary because of corruption, unnecessary outside pressure, lack of information etc. At present Nepalese commercial banks do not seem to be capable to invest in less risky and liquid sector such as Treasury Bills or Government Securities.

In order to acquire the knowledge of impact of credit risk and profitability of commercial banks in Nepal, the following research questions seeks to find answer for this study

1. What is the effect of credit risk, liquidity, cost per loan ,and profitability of Nepalese bank?
2. Does the leverage , have an any effect in profitability of Nepalese banks?
3. Is capital adequacy, spread rate affecting the in profitability of Nepalese banks?

1.3 Objectives of the Study

Fundamental objectives of this study are to analysis the effect of credit risk on profitability of the sample commercial banks. The specific objectives of the study are given below:

1. To examine the effect of credit risk, liquidity, cost per loan and profitability of Nepalese bank.
2. To assess the leverage has a any effect in profitability of Nepalese banks.
3. To know capital adequacy, spread rate affect the in profitability of Nepalese banks.

1.4 Rationale of the Study

Credit risk refers to the profitability of loss due to a borrower's failure to make payments on any type of debt. The research itself is very important because it aims to convert theory and knowledge into practical way. The main purpose of this research is to access the credit risk and its impact on profitability of Nepalese commercial banks. The commercial banks management epically the top-level management will use the study to understand how credit risk affects the profitability of the commercial banks and set up strategies in handling its effects. The research is important for Nepalese banking industry to ensure that the effective

strategies are being implemented to minimize risk for expanding markets and financial returns. And it also helps the regulators to make policy provisions. some positive return. Nobody is ready to bear risk without any return but to have returned one must be ready to face some risk. In Nepalese context, very few studies have been made and there is no specific magazines and articles on the topic. So the study will be more significant for the exploring and increasing stock investment.

This study is mainly concerned with position of profitability and credit risk indicators and impact of credit risk on profitability. This study is important for credit performance analysis of any banking sectors because it is only one measure to evaluate prosperity or recession of organization. After having the real knowledge of indicators of financial performance any shareholder can decide what they ought to do. Similarly, any concerning bodies will be benefited to study whole organization. So this study will be fruitful for those who want to know about selected sample banks in financial concern. Moreover, this study can also be used by government bodies, investors, competitor

1.5 Limitations of the Study

As every research has its pros and cons, the report is not possible to be far from some limitations. Some limitations arise while preparing the research are as follows:

- This study has concentrated only on few performances (ROA and ROE) that are related with credit practices.
- Through there has been in operation of 20 Commercial Banks in Nepal, but only 10 banks have been selected as sample.
- Whole study is based on data of ten-year period.
- Some of the financial tools of comparison has used in this study. Hence the drawbacks and weakness of those tools may adversely affect the outcomes of the study.
- The study is based on only secondary sources of data.
- The sources of data are published annual report and internet website which is assumed to be correct.

CHAPTER II

LITERATURE REVIEW

A Literature review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to the particular area of research. It is advancement of existing knowledge and in-depth study of subject matter.

The chapter reviews the main banking profitability and performance theories that have been developed and used by researchers and discuss their relevance to this study. So that past studies, their conclusions and deficiencies may be known and further research to be conducted. The main reason for a full review of research is to know the outcomes of those research in areas where similar concepts and methodology had been used successfully. Since the introduction of Structured Adjustment Programs (SAP) in the late 1980's, the banking sector worldwide has experienced major transformations in its operating environment. This Chapter comprises of previous studies and their findings related to the independent variables that are used in the study with respect to their relationship with the dependent variable to measure the bank's performance. The theoretical framework and hypotheses that have been drawn on the basis of the results of the past studies have also been included. Several studies such as research paper, books, published and unpublished articles related to credit risk and profitability were reviewed which are presented in this chapter.

2.1 Theoretical review

Credit risk is defined as the risk of default on debt that may arise from a borrower or counterparty failing to fulfil the payment obligation in accordance with agreed term and conditions. According to Basel Accord, the goal of credit risk management is to maximize the risk adjusted rate of return of banks by maintaining credit risk exposure within acceptable parameters. Credit risk is the probable risk of loss resulting from a side of borrower failure to repay a loan or meet the contractual obligation. Traditionally, it refers

to the risk that a lender may not receive the own principal and interest which result an interruption of the cash follow and increased cost for collection.

Credit risk is generally linked with lending which is major activity of banking business. Therefore, it is dangerous threat of probability in commercial bank. Credit risk can be defined as the uncertain risk that the loan provided by bank will decline its own value and it becomes worthless as the end. Thus, credit risk management is very important to make good health of the bank. According to the Nepal Rastra Bank directives, when the bank makes loan, they need to make provisions for loan loss in their accounts.

Ahmad and Ariff (2007) have examined the key determinations of credit risk of commercial banks on emerging economy banking systems compared with the developed economics. The authors found that regulation is important for banking systems that offer multiproduct and services; management quality is critical in the cases of loan-dominant banks in emerging economies. An increase in loan provision is also considered to be a significant determinant of potential credit risk. The authors further asserted that credit risk in emerging banks is higher than in developed economies.

Credit risk is the risk of a loss resulting from the debtor failure to meet its obligations to the bank in full when due under the terms agreed (Raghavan (2003)). Ghaith and Bani-Khalid (2019) showed that credit risk has a negative and significant impact on return on assets (ROA) and return on equity (ROE). Further, the results indicated that credit risk (measured by the ratio of doubtful debts to total loans, non-performing loans and loan losses to total loans) has a negative and significant impact on ROA, and ROE. While, the total deposits and bank size have positive and significant impact on financial performance of these Jordanian commercial banks.

Some major causes of credit risk are inadequate institutional capacity, unsuitable loan guidelines, unstable interest rate, inefficient management, unfitting regulations, increasing number in bank negligence in credit valuation, ineffective lending method, government interference and insufficient monitoring by the central bank. From the above definitions and views of researcher, it is concluded that the credit risk is a dangerous disease which causes serious financial problem when it is not properly managed.

There are various theories of credit risk some of them are following

Merton's Structural Model (1974): Developed by Robert C. Merton, this model views a firm's equity as a call option on its assets. Credit risk arises when the value of a firm's assets falls below its debt obligations. This model is based on the idea that the probability of default can be estimated by comparing the value of assets to the face value of debt.

Credit Migration Models: These models focus on the movement of borrowers or issuers across credit rating categories over time. The idea is to assess the likelihood of a borrower's credit quality deteriorating or improving. One well-known credit migration model is the Markov Chain model.

Credit Scoring Models: Credit scoring models use statistical techniques to assess the creditworthiness of individuals or entities based on historical data and a set of credit-related variables. The FICO score is a widely used credit scoring model for individuals, while various credit scoring models exist for assessing the creditworthiness of businesses.

Credit Default Swap (CDS) Pricing: Credit default swaps are financial derivatives that provide insurance against the default of a particular entity's debt. The pricing of CDS contracts can provide insights into the market's assessment of credit risk for a specific issuer.

Intensity-Based Models: These models focus on the intensity or rate at which credit events, such as defaults, occur over time. The intensity is often modeled as a function of various factors, including macroeconomic variables and issuer-specific characteristics.

Credit Risk Valuation Models: These models attempt to estimate the market value of credit risk in financial instruments, such as bonds and loans. Models like the Credit Valuation Adjustment (CVA) and Counterparty Risk models assess the potential losses due to credit risk in the context of derivatives trading and portfolio management.

Credit Risk Grading Models: These models are used by banks and financial institutions to categorize borrowers into different risk grades. These grades help in setting interest rates and loan provisions. Banks often develop their internal credit risk grading systems based on factors like financial ratios, industry risk, and business stability.

Survival Analysis Models: Survival analysis, also known as hazard modeling, is used to estimate the probability of an entity surviving (not defaulting) over time. These models are particularly useful in assessing the credit risk of long-term financial instruments.

Machine Learning Models: With the advent of big data and advanced analytics, machine learning techniques, such as random forests, support vector machines, and neural networks, are increasingly being applied to credit risk assessment. These models can handle large datasets and capture complex relationships among variables.

Economic Capital Models: These models assess the amount of capital a financial institution should hold to cover potential credit losses. They consider factors like portfolio risk, diversification effects, and economic conditions.

Profitability of commercial bank

In the banking industry, profitability refers to the bank ability to generate earnings in comparison to its expenses and incurred cost during a specific period of time (Tuladhar, 2017). It shows the capacity of bank to handle associated with risk while increasing their capital. There is various measurement of profitability such as return on assets, return on equity, net profit margin, return on capital employed, cost of income ratio, net interest margin, risk adjusted return on capital, price earnings ratio, total share return, return on invested equity among others. However, Brealey, Myers, Allen and Mohanthly (2012) recommends the important measurement of bank profitability to be as return on asset (ROA), return on equity (ROE) and net profit margin.

According to Duffie and Singleton (2012), profitability is a key factor of the commercial bank. One of the major goals of commercial bank is to increase the profitability. There are several categories to determine the profitability bank in the literature review however these can be categorized into two groups which are internal determinants and external determinants (Staikoursa and Wood, 2004). Internal determinants are influenced by decision of bank management and policy objectives which is controlled by the management whereas external determinant refers to factors outside the bank, which is beyond the control of management (Staikouras & Wood, 2004). However, this study mainly focuses on internal determinant which aims to examine the impact of credit risk management on bank profitability.

There is various measurement of bank profitability. Among those specific measurement of profitability, it depends on the objective of the research and practice of the sample bank. For this research, the return on equity (ROE) are the measurement that will be used as indicator of bank profitability.

Profitability is a key measure of a business's financial success and is crucial for its long-term sustainability. There are various theories and approaches that attempt to explain and analyze profitability. Here are some of the main theories of profitability:

Adam Smith's Invisible Hand: According to classical economists like Adam Smith, businesses that pursue their self-interest and maximize profits will indirectly benefit society as a whole through increased production, competition, and wealth creation.

Marginalism: Neoclassical economists emphasize the role of marginal analysis in profit maximization. Firms aim to produce at the point where marginal cost equals marginal revenue, resulting in maximum profits.

Cyert and March's Behavioral Theory: This theory suggests that managerial decision-making is influenced by various factors, such as satisficing (aiming for satisfactory outcomes rather than maximizing profits), bounded rationality, and organizational goals beyond profit maximization.

Market Structure Theories: Perfect Competition: In perfectly competitive markets, firms are price takers, and profit is driven to zero in the long run due to intense competition.

Dynamic Theories of Profit: Schumpeter's Innovation Theory: Joseph Schumpeter argued that entrepreneurs earn profits through innovation and creative destruction, introducing new products, processes, or technologies that disrupt existing markets.

Resource-Based Theory: This theory posits that a firm's profitability is determined by its unique resources and capabilities. Firms with valuable, rare, inimitable, and non-substitutable (VRIN) resources can achieve sustained competitive advantage and higher profits.

Jensen and Meckling's Agency Theory: This theory explores the relationship between principals (owners/shareholders) and agents (managers). It suggests that conflicts of interest can lead to agency costs, potentially impacting profitability.

Freeman's Stakeholder Theory: This theory argues that firms should consider the interests of all stakeholders (employees, customers, suppliers, etc.) and not just shareholders. Profitability should be balanced with the broader well-being of all stakeholders.

Institutional Theory: North's Institutional Theory: This theory emphasizes the influence of formal and informal institutions (laws, norms, culture) on a firm's profitability. Institutional factors can affect a firm's behavior and ability to generate profits

Prospect Theory: This theory, developed by Daniel Kahneman and Amos Tversky, suggests that individuals and firms may make decisions based on perceived gains and losses rather than strict profit maximization.

Triple Bottom Line: Some contemporary theories of profitability incorporate environmental and social considerations, emphasizing the importance of not only financial profits but also environmental and social sustainability (people, planet, profit).

2.2 Empirical Review

The relationship between credit risk management and its impact on profitability has been concern of emerging studies both in developed and developing countries. This study is focused on credit risk management in banking, the review mainly concentrated on studies related to the analysis of the credit risk and its impact on profitability or performance of the bank in the context of various countries. The empirical study is undertaken by authors who have investigated the relationship between credit risk management and profitability of bank along with the variables and method used by them.

Nwanna and Oguezie (2017) estimated result on the effect of credit management on the profitability of deposit money banks in Nigeria with focus on the all the existing DMBs; we found that the regression coefficient of Loan and Advances and Loan Loss Provisions are positively signed indicating that they positively influence profitability, during the period studied. However, Non- Performing Loan of deposit money banks detrimental to the profitability of banking businesses. Based on the findings, the study concluded that credit management of deposit money banks affect and increase their profitability. Although, most DMBs could not grow or perform as expected due to high rate of non-performing loan, strong DMBs still generates loans from the customers' deposits, and with the higher interest rate charged on the loan facilities, banks can give out more loans without fear because they know that income earned or paid on recovered loan would be enough to cancel

that which went bad. They also make provisions for loan loss but DMBs should carefully evaluate credit request before granting to customer(s) to circumvent high rate of non-performing loan.

Sapkota (2017) examined the study on credit risk management of joint venture commercial bank of Nepal. The author has selected six joint venture commercial banks as sample. The data has been used from 2008 to 2015 for the analysis. The study only used quantitative approach and focused on the description of the output from SPSS, it also used regression model to do empirical analysis. The independent variable used by the author includes credit and advance to total deposit ratio, credit and advance to fixed deposit ratio, credit and advance to total assets ratio, performing assets to total assets ratio, loan and loss provision while dependent variable includes return analysis. The finding of the study showed that banks significantly affect the credit risk management of joint venture commercial bank. The author concluded that the financial performance of credit risk management of joint venture commercial bank of Nepal is driven mainly by capital adequacy of specific factor. The trend of combined credit ratio of the commercial banks is increasing. With the increment in the ratio of credit, there is also increment in the non-performing assets it means that non-performing assets of commercial bank have been increasing regularly.

Tuladhar (2017) investigated the impact of credit risk management on profitability of Nepalese commercial bank. Data from twenty-eight commercial banks for the period of 2011 to 2015 have been collected and analysed using pooled regression analysis and panel data analysis. In this study, independent variables are capital adequacy ratio (CAR), liquidity ratio (LR), bank size (BS), asset quality ratio (AQR), leverage ratio (LER), non-performing loan ratio (NPLR), cash reserve ratio (CRR), coverage ratio (CR) and the number of female board members (FBM) have been used as indicator of credit risk management while dependent variable includes return on equity (ROE) and return on assets (ROA) as indicator of profitability. The result showed that coverage ratio, capital adequacy ratio and bank size have a positive impact on performance of bank. On the other hand, leverage ratio, non-performing loan ratio and female board members are found to have a negative impact on the performance of bank, however liquidity ratio, assets quality ratio, cash reserve ratio turned out to be not significant variables in determining bank performance. The study recommends an effective credit risk management for commercial

bank of Nepal that should maintain the optimal level of above-mentioned variables to enhance financial performance.

In addition, Ndoka and Islami (2016) studied the relationship between credit risk management and profitability of 16 commercial banks in Albania from 2005 to 2015 using a regression model. The independent variable used are non-performing loan ratio and capital adequacy ratio. Again, the dependent variables used are ROA and ROE. The overall findings of this study show that there exists a correlation between credit risk management of commercial banks in Albania and their profitability, meaning that an efficient credit risk management leads to higher profitability. Based on these findings, the authors recommend that commercial banks of Albania focus on managing credit risk especially on the control and monitor of non-performing loans.

Opoku (2016) assessed the association of the impact of credit risk on profitability of selected bank in Ghana. The author has used data from seven selected bank covering the nine-year (2005-2013). The independent variables used by author included non-performing loan to total loan, loan loss provision ratio and loan advance ratio as credit risk measurement whereas dependent variables included return on assets and return on equity as profitability indicators. In addition, some internal and external determinants of profitability were captured in model. The result showed that non-performing loan is negatively related to profitability while loan loss provision ratio and loan and advance ratio are positively significant to the profitability bank. Researcher also discovered that both capital adequacy and age have positive relationship with profitability while bank size has inverse relationship. The entire external factors were statistically significant. The study suggested the need for management of the bank to put effective measures in improving the credit risk management strategic to enhance their profitability.

Ebenezer and Omar (2016) investigate the effect of credit risk on profitability of commercial banks in Nigeria. Total 8 commercial banks were selected for the study, from the period 2011-2014. A panel data analysis was used as a major tool to analyse the data. The result revealed that there is a negative and significant relationship between non-performing loan ratio and the profitability; negative and insignificant relationship between debts to total assets ratio and profitability, and a positive and insignificant relationship between debts to total equity ratio and profitability of banks during the period of study.

Rasika and Rishan (2015) has investigated that there exists a relationship between financial performance (ROE) and credit risk (NPLR and CAR). Findings of the study illustrate that NPLR and CAR have a negative and significant effect on return on equity. Increase in NPLR causes to enhance the provision for non-performing loans and consequently it should be written off through the profits of the banks. This indicates that profitability is fairly affected by credit risk within the commercial banks in Sri Lanka. Commercial banks should keep to minimum capital adequacy ratio are able to absorb loans that have gone bad. However, it is evident that credit risk still remains a major concern for the commercial bank.

Samuel (2015) studied the effect of credit risk on the performance of the Nigerian commercial banks. The need for that study was driven by the negative consequences of the credit risk that affects profitability of the bank and their outcomes functional as the base to deliver policy measures to the stakeholders on how to deal with the credit risk permissible to improve the value of assets of the bank and diminish bank risk. They used non-performing loan and loan and advances ratios as the measure of credit risk and ROA as measure of profitability. The result showed that the ratio of non-performing loan, loan and advances to total deposit negatively affect the profitability. This study showed that there is a major association between bank performance and credit risk management.

Gizaw, Kebede and Selvaraj (2015) examined the influence of credit risk on profitability from Ethiopia commercial banks from 2003 to 2014. Panel data analysis was used as the major tool of data analysis. The study revealed that the credit risk measured by non-performing loan and capital adequacy ratio have significant impact on the profitability

Wolday (2015) investigated the impact of credit risk management on the performance of selected commercial bank in Ethiopia. The author has selected seven commercial banks as sample using balance panel data from 2009 to 2013 and 35 observations have been used for the analysis. The study only used the quantitative approach and focuses on the description of the output form SPSS, used regression model to do empirical analysis. The independent variables used by the author included loan loss provision, liquidity, operating inefficiency, loan growth and capital adequacy ratio as credit risk management whereas dependent variable used return on equity as indicator of profitability. The finding of the study showed that loan loss provision, operating inefficiency and loan growth have positive and statistically significant impact on bank profitability and liquidity and capital adequacy have a negative but statistically significant relationship with bank return on equity. The

author recommended that commercial bank should emphasis on the legally inspected credit risk factors.

Marshal and Onyekachi (2014) investigated the effect of credit risk and bank performance in Nigeria for the period of 1997-2011 using the time series, cross sectional and panel data analysis. The result shows that there is a positive impact of ratio of non- performing loans to loan and advances on banks performance. In addition, ratio of loan and advances to total deposit has a positive impact on banks performance. The conclusion was that increase in loan and advances increases banks performance through interest income generated from loan and advance.

Khan and Sattar (2014) examined the impact of interest spread on profitability of commercial banks in Pakistan. The results revealed that there is a significant positive relationship between interest spread and profitability

Adeusi et al. (2014) assessed the association of credit risk management and financial performance of bank in Nigeria. The author has used secondary data form annual report and financial statement of ten Nigerian bank for the period of 2006 to 2009 by adopting the panel data estimation technique as the data collection for the study is cross sectional unit observed over time. The independent variables included the cost of bad and doubt loans, non-performing loan, liquidity, equity to total assets ratio, equity to loan ratio and debt equity ratio whereas the dependent variables used the return on assets and return on equity. The finding of this study showed that there is an inverse relationship between bank's financial performance and cost of bad and doubtful loans but positive and significance relationship between capital assets ratio and bank's financial performance. The author concluded that there is significant relationship between bank's performance and credit risk management. The author recommended that the cost of bad debt and doubt loans, debt equity ratio and managed fund need to be managed in better way to achieve better financial performance of the bank.

Bhattra (2014) assessed the effect of credit risk on the performance of Nepalese commercial bank. By using poled data, the fourteen commercial banks have been selected as sample for the period of 2010 to 2015 totalling to 77 observations. The author has included capital adequacy ratio, non-performing loan ratio, cost per loan assets, cash reserve ratio and bank size as indicator of independent variables while the dependent variable includes return on assets. Regression analysis has been used to assess the data. The finding of the study showed that the commercial banks under consideration have been

practicing poor credit risk management. The author concluded that the negative effect of non-performing loan ratio on bank performance and the positive effect of cost per loan assets on bank performance. In contrast to other studies, the capital adequacy ratio and cash reserve have no influence on bank performance. Since there is a significant relationship between credit risk and bank performance. The author recommended that the banks should establish proper credit risk management strategies by conducting sound credit evaluation procedure before granting loans to customers.

Ogboi and Unuafé (2013) evaluated the credit risk management strategies and capital adequacy of financial performance of banks in Nigeria from 2004 to 2009 using panel data analysis. The author has used loan loss provision, loan and advance, nonperforming loan, capital adequacy ratio and liquidity as indicator of independent variables while dependent variable included return on assets. The author has analysed data using panel regression model. The result showed that sound credit risk management and capital adequacy impacted positively on bank's financial performance with the exception of loan and advance which was found to have a negative impact on bank profitability. Based on the result, the researcher recommended that Nigerian banks have to establish appropriate credit risk management strategies conducting rigorous credit appraisal before loan disbursement and draw down.

Charles and Kenneth (2013) showed that sound credit risk management and capital adequacy impacted positively on bank's financial performance with the exception of loans and advances which was found to have a negative impact on banks' profitability in the period under study. Based on the findings, it is therefore, recommended that Nigerian banks institute appropriate credit risk management strategies by conducting rigorous credit appraisal before loan disbursement and drawdown. It is also recommended that adequate attention be paid to enhance Tier-One capital of Nigerian banks.

Ogboi et al. (2013) investigated on the topic Impact of Credit Risk Management and Capital Adequacy of the Financial Performance of Commercial Banks in Nigeria showed that sound credit risk management and capital adequacy impacted positively on the bank's financial performance with the expectation of loan and advances which was found to have a negative impact on bank's profitability. In the study Loan Management and the Performance of Nigeria banks; there is no significant relationship between effective loan management and the performance of banks (Lawrence, 2013). This implies that, banks in Nigeria experience high profit irrespective of the huge credit risk exposure, conflicting with views shared by other researchers. The Prime concern of this study is to determine whether

credit management has an effect on the profitability of Nigerian banks using data from 2006 to 2015 knowing fully well that fall within the period of global economic depression.

Kaaya and Pastory (2013) analysed the relationship between credit risk and bank performance of commercial banks in Tanzania using regression analysis. The credit risk indicators used by the authors include loan loss to gross loan, non-performing loan, loan loss to net loan, and impaired loan to gross loan. As in previous studies, the bank performance indicator used is return on asset. The overall findings of this study show that credit risk indicators used in this study have a negative correlation with bank performance, meaning that an increase in credit risk tends to lower bank performance. The authors recommend that banks need to maintain a substantial amount of capital reserve to absorb credit risk in the event of failure, as well as to enhance lending criteria, portfolio grading and credit mitigation techniques to reduce chances of default.

Paudel (2012) has examined the impact of credit risk management on the financial performance of commercial banks in Nepal using the financial report of 31 banks for eleven years (2001-2011). The methods of data analysis in the study were descriptive, correction and multiple regressions. The financial performance indicator used in the study were return on assets (ROA). The predictors of the banks financial performance used in the study were; default rate, cost per loan assets and capital adequacy ratio. The author asserts that all these parameters have an inverse impact on banks financial performance. However, among the risk management indicators, default rate (NPLR) is the single most influencing predictor of bank financial performance in Nepal whereas cost per loan assets is not significant predictors of bank performance. The author concludes that credit risk management is crucial.

Afriyie and Akotey (2012) examined the impact of credit risk management on the profitability of rural and community bank in Ghana by using panel regression model for the period of 2006 to 2010. The independent variables that the author has taken are non-performing loan and capital adequacy ratio as indicator of credit risk management whereas dependent variables that the author has taken are return on assets and return on equity as indicator of profitability of the bank. The finding of the study showed the significant positive relationship between non-performing loan and profitability of bank that means non-performing loans are increasing proportionately to profitability. The author has found the reason of ineffective credit risk management that the bank shifts cost of loan default to other customers with higher interest loans.

Nawaz et. al. (2012) evaluated the impact of credit risk on the profitability of Nigerian banks from 2004 to 2008 using multiple regression analysis. The ratio of non-performing loan to loan & advances and ratio of loan & advances to total deposit were used as indicators of credit risk. Return on asset was used as an indicator of financial performance. The findings of this study show that bank profitability is inversely influenced by the level of loan and advances, non-performing loan and deposits thus exposing them to risk of illiquidity and distress. The authors recommend for the management to be cautious when setting up the credit policy as not to affect profitability.

Al-Khouri (2011) has examined the impact of bank's specific risk characteristics, and the overall banking environment on the performance of 43 commercial banks operating of the Gulf Cooperation Council (GCC) countries over the period 1998-2008. Using fixed effect regression analysis, results, results showed that credit risk, liquidity risk and capital risk are the major factors that affect bank performance when profitability is measured by return on assets while the only risk that affects profitability when measured by return on equity is liquidity risk.

Kithinji (2010) evaluated the relationship between credit risk management and profitability of commercial bank in Kenya forms the period of 2004 to 2008 by using regression analysis. The author has included the amount of credit and non-performing loan as indicator of independent variables while the dependent included return on total assets. The result of this study showed that there is no relationship between bank's performance and the amount of credit and level of non-performing loans. This means that the bulk of banks' profitability is not influenced by the amount of credit and nonperforming loans. The author recommended that commercial banks should enhance the profitability to focus on factors other than the amount of credit and nonperforming loans.

Tafri et al. (2009) examined the relationship between financial risks and profitability of the conventional and Islamic banks in Malaysia for the period between 1996 and 2005. The measures of profitability that have been used in the study were the return on equity (ROE) and return on assets (ROA) while the financial risks are credit risk, interest rate risk and liquidity risks. This study employed panel data regression analysis of Generalized Least Squares (GLS) of fixed effects and random effects models. It was found that credit risk has a significant impact on ROA and ROE for the conventional as well as the Islamic banks. The relationship between interest rate risk and ROE were found to be weakly significant for the conventional banks and insignificant for the Islamic banks. The effect of interest rate risk on ROA is significant for the conventional banks. Liquidity risk was found to

have an insignificant impact on both profitability measures.

Felix and Claudine (2008) analysed the relationship between bank performance and credit risk management. The results confirmed that credit risk (a ratio of non-performing loan to total loan) has a significant negative impact on return on equity and return on assets both measuring profitability.

Table 1

Meta table

S. N	Authers	Tittle	Variable	Method	Findings
1	poudel (2018)	Impact of credit risk on profitability of commercial bank	-Return on equity -Non performing loan -Solvency -Capital adequacy ration -Total assets -Interest spread rate -GDP(gross domestic product)	Descriptive statics,of variable -mean,(stander deviation)S.D, -Correlation Analysis	The study reveals that non-performing loan ratio has the significant negative impact on profitability of commercial banks in Nepal.
2	Ebenezer(2015)	The Empirical Effects of Credit Risk on Profitability of Commercial Banks: Evidence from Nigeria	-Debt to asset ratio -Non performing loan -Gearing ratio	-The regression model -Mean -S.D - Correlation -Coef. -Std. Error -t-Stat -Probability -p-value	The relationship of debt to asset ratio is found to have negative and insignificant effect on profitability.
3	Agyei (2012)	Credit Risk and Profitability of Selected Banks in Ghana	-ROE(Return on equity) -NCOTL(Net Charge Of/total loan & advance) -NPLR(Non performing loan / total loan &advance -PPPNTLA(Pre-Provision Profit/ total loan &advance) -SIZE(Bank size) -GRO(Growth in bank interest income) -TDA (Total Debt to Total Net Assets)	-Coef. -t-test -Prob. -R-sq -Wald chi2 -Probability -MEAN -STD. DEV.	from the study showed that credit risk indicators have a positive and significant relationship with bank profitability signifying that,

4	Eitan, (2019)	Credit Risk and Financial Performance Of The Jordanian Commercial Banks: A Panel Data Analysis	-ROE(Return on equity) -ROA(Return on assets) -CR(credit risk) -DTL(Doubtful loan) -NPL(Non performing loan) -LSL(Loan loss to total loan) -SZ(Size of bank) - TD(total deposit)	-MEAN -STD. DEV -Hausman test Chi-Sq -Prob (Chi-Sq) -F-statistic	. The results indicate that the impact of CR (doubtful loans, nonperforming loans and loan loss) are negative and statistically significant on profitability of Jordanian commercial banks.
5	TEFERA (2011)	Credit Risk Management And Profitability Of Commercial Banks In Ethiopia	-Return on equity -Capital adequacy ratio -Non performing loan ration	-MEAN -STD. DEV -Correlation -Covariance	There was no correlation among independent variables (NPLR and CAR. nonperforming loan ratio and capital adequacy ratio has a negative impact on profitability's of commercial banks in Ethiopia. Nonperforming ratio have inversely related with profitability whereas capital adequacy ratio has a direct relation with profitability of banks
6	Omar(2009)	The Impact of Financial Risks on Profitability of Malaysian Commercial Banks:	-Return on assets -return on equity -Net interest margin -Credit risk -Interest rate risk -Liquidity risk -Off balance sheet activities -Lagged probability -Bank size -Bank capital -GDP Growth rate	-Mean -Std.DEV -Correlation Coefficients -Probability -Degree of freedom	A summary it can be said that both ROA and ROE of conventional banks are affected by interest rate risk, credit risk and the off balance sheet activities of the banks in relation to derivatives.
7	Chang(2016)	The Impact of Credit Risk On Profitability Of Commercial Banks	-Return on assets -return on equity -Capital adequacy ratio -Non performing loan ration	-mean, -median, -Correlation Coefficients - Heteroskedasticity test	Our empirical findings show that the relationship between CAR and ROE is not significant.

8	Pracoyo(2018)	Analysis of The Effect of Capital, Credit Risk, and Liquidity Risk on Profitability in Banks	-Return on assets -Capital adequacy ratio -Non performing loan -Loan to deposit ration	-mean, -median -Std.DEV -t-Statistic - Prob	Capital proxied by Capital Adequacy Ratio (CAR has no significant effect on Profitability proxied by ROA credit Risk is proxied by Non-Performing Loans (NPLs) which have a significant effect on Profitability proxied by ROA. Liquidity risk proxied by Loan to Deposit Ratio (LDR) has no significant effect on Profitability proxied by ROA
9	Mohammed Bayyoud1 & Nermeen Sayyad1(2015)	The Relationship between Credit Risk Management and Profitability between Investment and Commercial Banks in Palestine	-Return on assets -Return on equity -Non-Performing Loan Ratio -(NPLR) total loans/ dividing NPLs	-mean, -median -Std.DEV -Linear regression model -Mean Square -F test -Coefficient	there is no relationship between credit risk and profitability in such way that profits of banks are affected due to credit facilities..
10	Singh(2018)	Impact of Credit Risk on Profitability: A Study Of Indian Public Sector Banks	-Return on assets -Capital adequacy ratio -Non-Performing Loans/total loan -Loan Provisions/ Non Performing Loans	-Pearson Correlation -Sig. (1-tailed) -R Square -Adjusted R Square -Std. Error of the Estimate -DurbinWatson	The study revealed that there is significant positive relationship between ROA and CAR, LPNPL, whereas ROA and NPLR have significant negative relationship.
11	Banna(2015)	The Effect of Credit Risk on the Banking Profitability: A Case on Bangladesh	-Net interest margin ratio (NIM) -Return on average equity (ROAA) -Non-Performing Loan Ratio(NPLGL) -loan loss reserve to gross loan(LLRGL) -Capital adequacy ratio -loan loss reserve to nonperforming loan(LLRNPL)	-mean, -Std.DEV -Houseman test	The results reveal a robust significant negative relationship between NPLGL and LLRGL and all profitability indicators of the commercial banks in Bangladesh.
12	Li Mei (2019)	Credit Risk And Bank Profitability	-Return on Assets	-Correlation means	The research proposes that since credit risk had a

		of Commercial Banks In Ghana	-Non-performing loans -Ratio Capital reserve ratio -Cost per loan assets Asset - growth ratio -Cash Reserve Ratio (CRR)	- Standard deviation -variance - Range -Skewness -Kurtosis	negative association with bank profitability of the companies.
13	Bandara(2021)	Credit Risk and Profitability of Banking Sector in Sri Lanka	-Return on Assets -Non-performing loans -(LTDR)Loan to Deposit Ratio -(NCOR) Net Charge Off Ratio	-Correlation -F statistics -Hausman Test chi- -Prob> chi-square	he study finds that the credit risk affects the banks' profitability in Sri Lanka as the variables NPLR negatively affect profitability This study also indicates that increased capital requirements for credit risk and the existence of a robust credit control mechanism will benefit profitability
15	Biswas(2021)	Effect of credit risk on commercial banks' profitability: A case study of Bangladesh	- Return on Assets -Non-performing loans - Capital adequacy ratio -Cost to loan ratio -Cash reserve ratio -Bank size	-Standard deviation -Std. Error -Mean -Regression analysis -Coefficients -t Stat - P-value	The study results showed a significant positive relationship between ROA and CAR as well as CLA. On the other hand, ROA and NPL as well as bank size had significant negative relationship.
16	Biswas (2021)	Effect of credit risk on commercial banks' profitability: A case study of Bangladesh	- Return on Assets -Capital adequacy ratio -Nonperforming loan -Cost to loan assets ratio -Bank size	-Regression Analysis -Std. Error -Standard deviation -Mean -Coefficients -Std. Error -t Stat - P-value	The study results showed a significant positive relationship between ROA and CAR as well as CLA. On the other hand, ROA and NPL as well as bank size had significant negative relationship
17	Sita Bagale (2023)	Credit risk management and profitability of commercial banks in Nepal	-Return on Equity (ROE) -Capital Adequacy Ratio (CAR) -Liquidity ratio (LR) - Non-performing loan ratio (NPL) -Cash Reserve Ratio (CRR) -Bank Size (BS) -Loan- loss Provision Ratio	-Standard deviation -Mean -Correlation Analysis -Regression	The study reveals that bank size and liquidity ratio have a positive impact on return on equity. The capital adequacy ratio also reveals a significant negative impact on return on equity.

			(LLP)		
18	Shrestha,(2018)	Credit Risk Management and Profitability of Joint Venture Commercial Banks in Nepal	-Return on Assets -Non-performing credit to total ratio -Credit Deposit Ratio	-R Square -Adjusted R Square -Std. Error of estimate -Mean - Std. Deviation -Regression Analysis	The paper confirms that there is positive relationship between credit risk and profitability in such way that profits of banks are affected due to credit facilities.
19	Bhandari2(2023)	Risk management and its impact on profitability of commercial banks in Nepal	-Return on Assets -Return on Equity -Non-performing loan ratio (NPL) -Cash Reserve Ratio -Credit Deposit Ratio --Current ratio -Liquid assets ratio	-Mean - Std. Deviation -Pearson's - correlation test -Coefficient -Std. Error t-Statistic -Prob.	the study found that capital adequacy ratio, credit to deposit ratio, non-performing loan ratio and liquid assets ratio have a significant negative impact on profitability
20	Tamang (2022)	Impact Of Credit Performance On The Profitability Of Commercial Banks In Nepal	- Return on Assets, -Earning per Share, -Credit Deposit Ratio, - Capital Adequacy Ratio - Non-performing loan	- Correlation coefficient -Regression	The study concluded that there is a positive relationship between average capital adequacy ratio (CAR), return on assets (ROA) and company size and profitability, and there is a negative relationship between non-performing loan (NPL) and earnings per share commercial banks.
21	Kutum (2017)	The Impact of Credit Risk on the Profitability of Banks Listed on the Palestine Exchange	-Return on Equity -Return on Assets -Net Charge Off (Impairments) -Pre-Provision Profit -Bank Size -Growth in Net Income Year on Yea -Total Debt / Total Assets	-Mean - Std. Deviation -R Square -Adjusted R Square -t-value -Coefficients	Study concludes that credit risk, as measured by non-performing loans to total loans and advances has a weak but positive relationship with profitability as measured by return on assets. The study also found a weak but positive relationship between the sizes of the banks and profitability
22	Abel (2022)	Credit risk and bank profitability in zimbabwe	- Non-performing loan -Bank Size -capital adequacy -Loan market share -Inflation -The Gross Domestic Product	-Mean - Std. Deviation -Median -Correlation -Regression	The study determined that both macroeconomic and bank-specific factors determine bank performance. Bank performance is positively explained by capital adequacy, bank size, loan market share, and economic growth, whereas inflation has a negative effect on long-term profitability.
23	Bhandari	Credit Risk	-Return on	-Coefficient of	All the commercial banks have

	(2019)	Management And Profitability Of Nepalese Commercial Banks	Equity -Loan and Advance Provision -Non-performing loan Loan Loss - Provision	Correlation -Regression Analysis -Test of Hypothesis -Mean	insufficient liquidity. It shows that banks have not got proper investment sector to utilize their liquid money. Now, in the context of Nepal, many banks and other financial institutions are functioning to collect deposit and invest money somewhere.
24	Olufunsh(2022)	The Impact of Credit Risk on the Profitability of Commercial Banks in Nigeria	-Credit risk, -Loan loss provision - loan to deposit ratio, -Capital adequacy - Nonperforming loans -Return on Assets	-Mean - Std. Deviation -Median -Jarque-Bera -Regression Results	According to the study, there is a significant and positive relationship between the profitability of commercial banks in Nigeria and the loan loss provision ratio to total assets
25	Gizaw (2015)	The impact of credit risk on profitability performance of commercial banks in Ethiopia	Return on Equity -Return on Assets -Nonperforming loans -capital adequacy -Loan and advance to - Deposit ratio -Loan loss provision ratio	-Coefficients - Standard error (Robust) - Probabil it y /Z/ -Conf. interval -Results of regression analysis	The result revealed that credit risk profile of Ethiopian banks had been improving during the study period. The ratio of nonperforming loan and loan loss provision ratio 66 are sharply declining in recent past. Even as the NPL reached minimum,

2.3 Research Gap

As discussed earlier, researcher reviewed several literatures pertaining to credit risk and found the most of the study regarding credit risk has been studied on commercial bank. Pervious researcher has taken several factors for studying different dimension of credit risk and its influence in profitability (Raghavan, 2003). Considering all the studies related to credit risk the researcher has made an effort to study the effect of credit risk on profitability in commercial banks. Previous studies have used variables like credit interest, credit facilities ratio, provision for facilities ratio, leverage ratio and non-performing loan, gross loans ratio as loan provision to total assets. The current study, therefore, aims to contribute the literature gap on the subject matter by adding fresh data and expanding time series. This study has considered variables as non-performing loan, solvency ratio, capital adequacy ratio, loan and advances, cost per loan, Inflation, Bank size, return on equity. In this way, this study results the better relationship between credit risk management and profitability of the banking performances (Tuladhar, 2017).

CHAPTER-III

RESEARCH METHODOLOGY

This chapter deals with the research methodology of the study. The study aimed to identify the dimension of credit risk and its effect on profitability in commercial banks in Nepal. This chapter looks at the various methods and procedures of researcher adopted in conducting the study in order to address and answer the research problem raised in the first chapter. This chapter is organized in the following structure; the research design, population, sample size, sampling technique, sources of data collection, data collection methods, tools used for data analysis.

3.1 Research Design

Research design is a master plan specifying the method and procedures for collecting and analyzing the needed information. To conduct the research study, researcher has used descriptive and causal comparative research design.

Descriptive research is defined as a research method that describes the characteristics of population or phenomenon that is being studied. This methodology focuses more on the “what” of the research subject rather than the “why” of the research subject. A causal comparative design is a research design that seeks to find relationships between independent and dependent variables after an action or event has already occurred. It “describes” the subject of the research, with covering “why” it happens.

Thus, the researcher has used descriptive and causal comparative research design to gain depth knowledge of the study.

3.2 Population and Sampling

10 commercial banks operated in the Nepalese economy were considered as the total population for the study, out of them 10 commercial banks are taken as a sample. This sample is taken covering 50% of the population. The sample banks for the study are listed below: Himalayan Bank Limited, Everest Bank Limited, NMB Bank Limited, Standard Chartered Bank Limited, NIC Asia Bank Limited, Mega Bank Limited, Prime Commercial Bank Limited, Kumari Bank Limited, Rastriya Banijya Bank Limited and

Agriculture Development Bank Limited. The study period covers ten fiscal year data starting from 2014 to 2022.

Sampling Method

The samples have been selected has been taken by using simple random sampling techniques.

3.3 Nature and Sources of Data Collection

The research study is basically based on secondary data and quantitative nature of data. Following are the secondary source of data used in the study. Major secondary sources of data are as follows:

- Annual reports of commercial bank as well as published by Nepal Rastra Bank.
- Banks websites and other related websites.
- Library research study.
- Internet, home pages, the influence the performance of the commercial banks.

3.4 Data Collection Procedure

As the study is based mainly on the secondary data, Other reference materials are collected from the libraries. Himalayan Bank Limited, Everest Bank Limited, NMB Bank Limited, Standard Chartered Bank Limited, NIC Asia Bank Limited, Mega Bank Limited, Prime Commercial Bank Limited, Kumari Bank Limited, Rastriya Banijya Bank Limited and Agriculture Development Bank Limited and NRB publication, different Journals, Magazines and other published and unpublished reports help to research more convenient.

3.5 Methods of Analysis

For the purpose of this analysis, financial ratios and statistical tools were applied to examine the impact of independent variables on the dependent variables. In this study, the data are collected through published sources. The annual reports of sample banks for the period of ten years from the website of selected sample banks regarding the profile of sample banks and other related documents were collected from internet websites.

Different statistical tools of tables are used to analysis and interpret the data.

- To data for the research study is to analyze through statistical tools descriptive statistics contain certain measures of dispersion or validity (mean, standard

deviation and coefficient of variations).

- Correlation tools of SPSS are used to analysis between independent variables and dependent variables. Moreover, regression tools will be used to analyze effect on dependent. Furthermore, mean and standard deviation will also be used to analyze the data.

Financial Tools

For proper financial analysis of data ratio analysis is the best tools. Through ratio analysis relationship can be established among the data and research into conclusion. Under ratio analysis following ratios related to banks is analyzed:

Table 2

Variables Descriptive

S.N.	Variables	Measurement
1	Non-Performing Loan Ratio	Non-Performing Loan / Total Loan
2	Solvency Ratio	Liquid Assets / (Total Deposit + Short-Term Borrowing)
3	Capital Adequacy Ratio	Capital / Risk Weighted Assets
4	Loan and Advances to Total Deposit Ratio	Loan and Advance / Total Deposit
5	Return on Equity	Net Profit / Total Equity
6	Cost per loan	Total loan / total operating cost
7	Interest spread	Interest in deposit – interest in loan
8	Return on assets	Return / total assets
9	Net interest margin	Interest income / total income

Statistical Tools

The statistical tool is essential to measure the relationship of two or more variable. It is the mathematical technique used to facilitate the analysis and interpretation of the performances of the organizations. It also helps to present the data, show the relation and deviations or differences of variables of organizations. In this study, the following statistical tools are used:

a. Descriptive Statistics

Descriptive statistical tools help us to find out the trend of financial position of the sample banks. It also analyses the relationship between variables and helps banks to take appropriate decisions regarding to fulfillment of organization goals. Descriptive

analytical tools such as Percentage, mean (arithmetic), variance and standard deviation are used in the dissertation.

The model indicates the characteristics of statistical mean, standard deviation and coefficient of variation.

Arithmetic mean

The average of a set of numerical values, as calculated by adding them together and dividing by the number of terms in the set is known as arithmetic mean. It has been used to find out the average value of different financial ratio of sample commercial bank. A mean is also known as average.

Mathematically, Arithmetic mean is expressed as:

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

Where,

$\sum x$ = sum of all values of the observations

n = Number of observations

x = Value of variables

Standard Deviation

Standard deviation is expressed as the positive square root of the variable. It is the average difference between observed values and the mean. The standard deviation is used when expressing dispersion in the same unit as the original measurements. It is used in expressing the degree to which data spread out. A small standard deviation means a high degree of uniformity of the observation.

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

Coefficient of Variation

Coefficient of variation (CV) is statistical measure of the dispersion of data points in a data series around the mean. It is also defined as the ratio of standard deviation to the mean. It shows the extent of variability in the relation to the mean of population. Mathematically, Coefficient of variation is expressed as:

$$\text{C.V.} = \frac{\sigma}{\bar{X}} \times 100$$

Where,

σ = Standard Deviation

$\bar{X}$ = Mean Value of Variables

b. Inferential Statistics

Unlike with the data description which have the focus of describing the sample data, while the focus of inferential analysis is on estimation or hypotheses testing, by using sample purely to make inferences about the population. This process is formally known as inferential statistics. There are two major groups of inferential statistics,

- (i) parametric and
- (ii) Non-parametric.

In my proposed research, I have used only parametric test as per the need. Under the parametric test, Correlation Analysis and Regression analysis are used.

Coefficient of Correlation

Correlation is a statistical device designed to measure the degree of association between two or more variables. Measurement of liner relationship between those variables are said to be the calculation of correlation coefficient. The coefficient of correlation, denoted by r is computed as under:

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

Where,

N = no of observation in series X and Y

$\sum X$ = Sum of observation in series X

$\sum Y$ = Sum of observation in series Y

$\sum X^2$ = Sum of square observation in series X

$\sum Y^2$ = Sum of square observation in series Y

$\sum XY$ = Sum of the product of observation in series X and Y

The Karl Pearson coefficient of Correlation always falls between -1 to +1. The Value of correlation of coefficient in -1 signifies the negative correlation and in +1 signifies the positive correlation coefficient.

If, $r = 0$, there is no relationship between the variables

$r < 0$, there is negative relationship between the variables
 $r > 0$, there is positive relationship between the variables

$r = -1$, the relationship is perfectly negative between the variables
 $r = +1$, the relationship is perfectly positive between the variables

Coefficient of Regression

Regression analysis is a statistical measurement of the average relationship between two or more variable in term of the original unit of the data. Thus, it can be said that regression is the estimation or the prediction of the one variable's value from the given variable's value. It is a statistical tool that is used in prediction of value of unknown variables from known variables. The simple regression analysis describes the average relationship between only two variables. It measures the per unit change whereas multiple regression describes the two or more independent variables that are used to estimate the unknown value of a dependent variable.

$$ROE = a + b_1 * NPLR + b_2 * SR + b_3 * CAR + b_4 * LATDR$$

Where,

a = Constant

b_1 = Beta coefficient

$NPLR$ = non-performing loan ratio b_2 = Beta Coefficient

SR = Solvency Ratio b_3 = Beta coefficient

CAR = Capital adequacy ratio b_4 = Beta coefficient

$LATDR$ = Loan and advance to total deposit ratio

3.6 Research Framework and Definition of Variables

Research framework identifies the variables, states the relationship of two or more variables, and reasons of expecting such relationship. In this research study, research framework shows the relationship between two variables i.e., credit risk and profitability. Profitability is the dependent variable and other factors are the independent variables. They are mentioned below with the help of diagram:

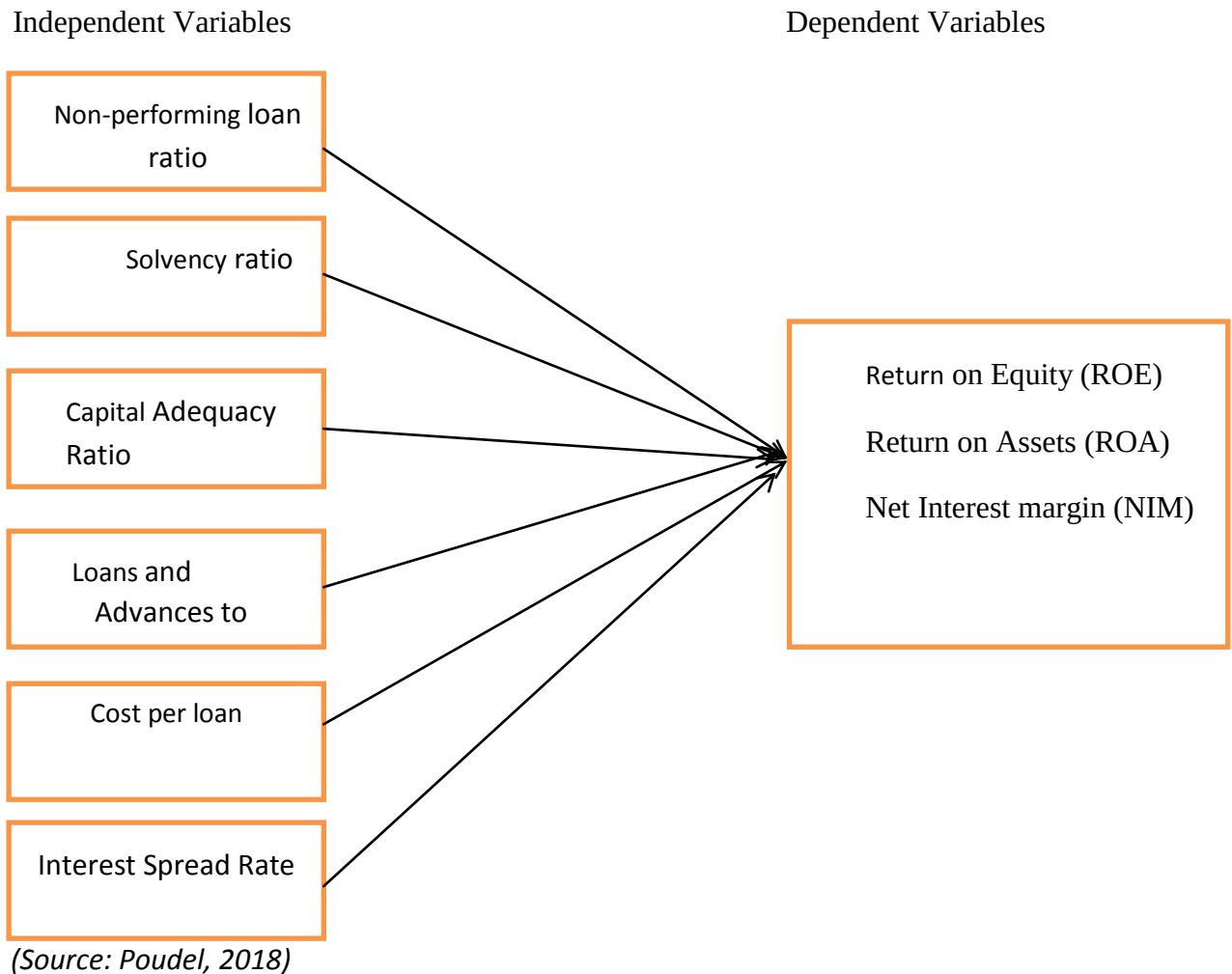


Figure 1 Research Framework

Description of Variables Return on Equity (ROE)

The Return on Equity measures the profitability of equity funds invested in the bank. This ratio is to find out how efficiency the funds supplied by the equity shareholders have been used by management. This indicates the firm's ability of generating profit per rupee of shareholders' funds of the company.

Generally, the more amount of return on equity (ROE) shows the better efficiency to generate more return for the shareholders. Those banks are the better one which has the higher ROE comparing to their competitors. ROE has been widely used as profitability of bank while it examines the relationship between credit risk management and profitability or performance of the bank.

ROE can be calculated as:

$$\text{ROE} = \frac{\text{Net profit After}}{\text{Total Equity}} \times 100$$

Non-performing Loan Ratio (NPLR)

A non-performing loan (NPL) is a loan in which the borrower is in default and has not paid the monthly principal and interest repayments for a specified period. Non-performing loans occur when borrowers run out of money to make repayments or get into situations that make it difficult for them to continue making repayments towards the loan. Usually, banks classify loans as non-performing loans when the repayments of principal and interest are due for more than 90 days or depending on the terms of the loan agreement. As soon as a loan is classified as an NPL, it means that the likelihood of receiving repayments is significantly lower.

Generally, non-performing loans are considered bad debts because the chances of recovering the defaulted loan repayments are minimal. However, having more non-performing loans in the company's balance hurts the bank's cash flows, as well as its stock price. Therefore, banks that have non-performing loans in their books may take action to enforce the recovery of the loans they are owed.

One of the actions that lenders can take is to take possession of assets pledged as collateral for the loan. For example, if the borrower provided a motor vehicle as collateral for the loan, the lender will take possession of the motor vehicle and sell it off to recover any amounts owed by the borrower. Banks sell the non-performing loans at significant discounts, and the collection agencies attempt to collect as much of the money owed as possible. Alternatively, the lender can engage a collection agency to enforce the recovery of a defaulted loan in exchange for a percentage of the amount recovered.

To measure the non-performing loan ratio ratio (NPLR) following formula is used:

$$\text{NPLR} = \frac{\text{Non-performing Loan}}{\text{Total loan}} \times 100$$

Where, NPLR = non-performing loan ratio

Solvency Ratio

This ratio is computed to judge the financial position from long term as well as short-term solvency and measure the ability of enterprises to pay the interest regularly and to repay the principle (i.e., capital amount) on maturity period. This ratio indicates the mix of fund provided by owners and outsider creditors. It is also known as leverage ratio or capital structure ratio. Its main objective is to show collective capital or formation of a company from owners and outsiders who invested in the company.

To measure the solvency ratio following formula is used:

$$\text{Solvency ratio} = \frac{\text{Liquid Assets}}{\text{Total deposit+short term}} \times 100$$

Capital Adequacy Ratio (CAR)

Capital adequacy ratio measures the ratio between capital funds and risk weighted assets. Capital fund refers the core capital and supplementary capital. Core capital includes paid up capital, share premium, non-redeemable preference share, general reserve fund, cumulative profit/loss, capital redemption reserve, capital adjustment fund, and other free reserves, less goodwill, investment in excess of prescribed limit, fictitious assets, and investment in securities of companies with financial interest. Supplementary capital includes loan loss provision on pass loan, assets revaluation reserve, hybrid capital instruments, unsecured subordinated term debt, exchange equalization fund, additional loan loss provision, investment adjustment reserve, and provision for loss on investment.

Similarly risk weighted assets refers to on balance sheet assets and off-balance sheet items which includes balance in domestic and financial institution, balance in foreign banks, money at call, loan on the guarantee of international rated bank, investment in share debenture and bond, other investments, loan and advances, fixed assets, letter of credit, bid bond, advance payment guarantee and contingent liabilities. According to NRB's directives, commercial banks are required to maintain the certain level of capital fund against the risk-weighted assets.

In conclusion, capital adequacy is index of regulatory authorities use to determine the optimum amount of money (i.e., equity, retained earnings, and other reserves) that a bank must have to be able to take certain levels of risk endangering deposits funds, or its existence.

To measure the capital adequacy ratio (CAR) following formula is used:

$$\text{CAR} = \frac{\text{Total Capital}}{\text{Risk Weighted Assets}} \times 100$$

Where,

CAR = Capital adequacy ratio

Loan and Advance to Total Deposit Ratio (LATDR)

This ratio measures the extent to which the banks are successful to utilize the outsider's fund (total deposit) for the profit generating purpose on the loan & advance. Generally, a high ratio reflects higher efficiency to the utilization of fund and vice-versa. It can be calculated by dividing the amount of loans and advances by the amounts of total deposits, which is given as below:

$$\text{LATDR} = \frac{\text{Loan and Advance}}{\text{Total Deposit}} \times 100\%$$

Where, LATDR = Loan and advance to total deposit ratio

Here, loans and advances refer to total of loan, advances and over draft (i.e., in local currency plus convertible foreign currency) and total deposits refer to total of all kind of deposits.

Interest Spread Ratio (ISR)

Interest is the major sources of income for the financial institution. Interest spread is interest is interest rate spread between average interest received and average interest paid. The fluctuation of interest rates creates interest risk to the financial institutions. Interest rate risk has significant implications on borrowing cost of the borrowers, returns of the investors, and profitability of the banks. The greater the spread, the more profitable the financial institution is likely to be; and the lower the spread, the less profitable the institution is likely to be. Thus, there is close relationship between interest spread and profitability of the bank.

Cost per loan

Cost per loan refers to the average cost incurred by a lender or financial institution to process and administer a single loan. the cost per loan includes various expenses and operation cost that are incurred during the loan origination and servicing process. (2019) Cheng Li (cost per loan assets) shows a positive coefficient with ROA. Biswas (2021), The study results showed a significant positive relationship between ROA and CAR as well as CLA.

$$CPL = \frac{\text{Total loan and Advance}}{\text{Operating Cost}}$$

Return on Assets

The Return on assets measures the profitability of assets invested of the bank. This ratio is to find out how efficiency the funds utilized by management. This indicates the firm's ability of generating profit by fund of the company.

Generally, the more amount of return on assets (ROA) shows the better efficiency to generate more return of banks assets. Those banks are the better one which has the higher ROA comparing to their competitors. ROA has been widely used as profitability of bank while it examines the relationship between credit risk management and profitability or performance of the bank.

ROA can be calculated as:

$$ROA = \frac{\text{Net Profit Tax}}{\text{Total Assets}} \times 100$$

Where,

ROA = Return on Assets

Net interest margin (NIM)

It is a tools to measure how much bank earn interest income from its earning assets. It represent the banks ability to earn maximum income from its portfolio.

We can calculate as below

$$NIM = \frac{\text{Net Interest Income}}{\text{Profit of the Year}}$$

CHAPTER-IV

RESULTS AND DISCUSSION

This chapter presents the empirical findings of the study and deals with the presentation, analysis and interpretation of relevant data of sample bank in order to fulfil the objectives of the study. The data has been analysed according to the research methodology which is mentioned in third chapter to achieve the best result. To achieve the objective of this study, more efforts have been made to highlight the credit risk.

4.1 Results

4.1.1 Pattern Analysis of Variable

Table 3

Return on Equity

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	MEAN	S.D
HBL	10.76	14.89	15.4	18.34	14.17	21.58	21.22	17.06	16.85	16.70	3.42
EBL	10.87	8.56	13.5	17.33	16	16.04	20.32	22.85	28.4	17.10	6.11
NMB	30.81	12.08	8.94	13.32	13.54	16.49	21.96	16.4	14.57	16.46	6.46
SCB	5.8	9.44	15.15	19.49	18.66	11.98	17.18	21.69	26.27	16.18	6.35
NIC	35.49	17.09	19.26	22.73	12.09	16.84	16.5	13.05	15.93	18.78	7.01
MBL	11.64	12.14	14.65	12.82	16.56	16.92	17.25	12.63	12.46	14.12	2.25
PCBL	3.83	13.65	10.97	16.4	15.4	15.46	20.65	17.21	15.3	14.32	4.72
KBL	12.28	10.43	6.71	10.5	9.93	8.67	18.11	11.12	11.52	11.03	3.12
RBB	7.75	11.94	19.01	23.38	19.19	26.48	27.36	69.56	76.96	31.29	24.69
ADBL	6.76	12.44	13.23	17.11	13.01	12.6	13.6	22.01	11.67	13.60	4.13
MEAN	13.60	12.27	13.68	17.14	14.86	16.31	19.42	22.36	22.99		
S.D	10.72	2.52	4.00	4.15	2.89	4.98	3.78	17.08	19.84		

Table 3, shows ratio of ROE of ten commercial banks for nine fiscal years with their mean. The mean value of all sample banks of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 16.70%, 17.10%, 16.46%, 16.18%, 18.78%, 14.12%, 14.32%, 11.03%, 31.29% and 13.16% respectively. Among those banking industries sample ROE of mean value of RBB has a higher that's is 31.29% and lower ROE of mean values is of KBL that is 11.03%. Higher ROE indicates that bank can generate more rate of return by owner's equity. In this situation, RBB can generate more rate of return than other banks in the given fiscal year. The standard deviation of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 3.42%, 6.11%, 6.46%, 6.35%, 7.01%, 2.25%, 4.72%, 3.12%, 24.69% and 4.13% respectively. It indicates that RBB has a

higher fluctuation in ROE means RBB is more profitable bank. And lower fluctuation in ROE of MBL which means MBL is earning less profit .

In the given fiscal year maximum mean in 2014 that is 22.99% which indicates banks provide a more return to its shareholder than other fiscal year and bank provides lower return to shareholder in 2021 it means bank can not perform well in this fiscal year .

Table 4

Capital adequacy ratio (CAR) (%)

YEAR	2022	2021	2020	2019	2018	2017	2016	2015	2014	MEAN	S.D
HBL	11.75	13.89	14.89	12.6	12.46	12.15	10.84	11.14	11.23	12.33	1.34
EBL	11.89	12.48	13.38	13.74	14.2	14.54	12.66	13.33	11.31	13.06	1.06
NMB	13.59	15.08	15.08	15.45	15.75	13.61	10.98	11.13	10.75	13.49	2.04
SCB	21.7	17.17	18.51	19.69	22.99	21.08	16.38	13.1	12.27	18.10	3.73
NIC	13.51	12.47	13.5	13.32	12.24	13.83	12.44	12.49	14.05	13.09	0.69
MBL	13.36	12.94	13.24	15.27	17.91	14.8	12.95	14.92	16.06	14.61	1.68
PCBL	13.33	14.82	13.84	12.76	12.24	13.28	11.6	12.16	12.4	12.94	0.99
KBL	12.63	13.71	15.35	11.75	13.36	14.5	11.69	10.84	11.81	12.85	1.49
RBBL	13.97	13.46	12.64	13.39	11.46	10.39	10.46	10.16	4.2	11.17	2.86
ADBL	16.34	16.94	19.29	20.37	20.33	20.41	17.18	17.16	14.93	18.11	2.03
MEAN	14.21	14.30	14.97	14.83	15.29	14.86	12.72	12.64	11.94		
S.D	2.77	1.61	2.14	2.81	3.71	3.20	2.18	2.01	2.94		

Table 4 shows the capital adequacy ratio of ten commercial banks for nine fiscal years and with their mean. The mean value of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 12.33%, 13.06%, 13.49%, 18.10%,13.09%, 14.61%, 12.94%, 12.85%, 11.17% and 18.11% respectively.

According to Capital adequacy framework 2015 commercial bank should maintain the minimum capital adequacy ratio should be not less than 8.5% of the total risk weighted exposure.in the above table shows that all the sample bank has maintained regulatory instruction it means all the given bank can absorbed all the risk that arise in banking system. In that bank RBBL had just maintain this ratio otherwise all other bank were easily maintain CAR .bank ADBL were maintain higher CAR it means bank has enough capital to mitigate risk.

Likewise the standard deviation of The standard deviation of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 1.34%, 1.06%, 2.04%, 3.73%, 0.69%, 1.68%, 0.99%, 1.49%, 2.86% and 2.03% respectively. During this period S.D of SCB is higher 3.73% means this bank is more risky in maintain risk of bank likewise NIC has lower S.D 0.69% means NIC is maintain enough capital entire fiscal year.

In given fiscal year CAR is higher in 2018 it means sample bank were maintain more capital in this year than other banks and in fiscal year 2013-14 bank maintain lower CAR it means bank had less capital to absorb risk than other fiscal year. And S.D in the fiscal year were maximum in 2018 means bank were more riskier in those fiscal year.

Table 5

Non performing loan (NPL)%

YEAR	2022	2021	2020	2019	2018	2017	2016	2015	2014	MEAN	S.D
HBL	1.59	1.59	0.48	1.01	1.12	1.4	0.83	1.23	3.22	1.39	0.78
EBL	0.12	0.12	0.12	0.22	0.16	0.2	0.25	0.38	0.66	0.25	0.18
NMB	1.45	1.45	2.27	2.68	0.82	0.88	2.68	2.27	0.45	1.66	0.84
SCB	0.98	0.44	0.96	0.44	0.15	0.18	0.19	0.34	0.48	0.46	0.31
NIC	0.49	0.5	0.75	0.46	0.06	0.36	0.76	2.07	2.33	0.86	0.79
MBL	1.04	1.23	1.15	0.86	0.82	1.36	0.79	1.75	2.18	1.24	0.46
PCB	1.4	0.99	1.48	1	0.85	0.88	1.23	1.83	2.43	1.34	0.52
KBL	1.11	0.96	1.39	1.01	1.05	1.86	1.15	2.49	4.03	1.67	1.02
RBBL	2	3.23	4.08	4.59	4.75	3.77	4.25	5.35	6.38	4.27	1.25
ADBL	2.09	1.88	2.84	3.29	3.5	4.6	4.36	5.35	5.46	3.71	1.32
MEAN	1.23	1.24	1.55	1.56	1.33	1.55	1.65	2.31	2.76		
S.D	0.62	0.89	1.20	1.46	1.55	1.51	1.56	1.76	2.05		

Table 6, shows the non-performing loan ratio of ten commercial banks for the ten fiscal years with their mean value and coefficient of variations. The mean value of all bank (HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL) are 1.39%, 0.25%, 1.66%, 0.46%, 0.86%, 1.24%, 1.34%, 1.67%, 4.27% and 3.71% respectively. It shows that the conditions of all banks are good. Among those banks, EBL is the best one. It shows the result of effective credit management of the bank and its efforts of recovering bad debts through establishment of recovery unit. and RBBL has a higher so this bank has more bad debt or loss loan.

The standard deviation of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 0.78, 0.18, 0.84, 0.31, 0.79, 0.46, 0.52, 1.02 1.25 1.32 respectively. It indicates that EBL has the lowest among other bank and highest was ADBL it means bank ADBL can not maintain its recovery.

In the given fiscal year mean value highest in 2014, it mean in this fiscal year banks had a more bad loan than other year.

Table 6

Loan and advance to total deposit(%)

YEAR	2022	2021	2020	2019	2018	2017	2016	2015	2014	MEAN	S.D
HBL	92.14	89.87	82.31	87.37	88.31	85.1	79.12	75.37	71.82	83.49	6.88
EBL	89.38	85.3	83.52	87.01	81.86	84.05	73.52	66.63	78.01	81.03	7.18
NMB	96.68	96.69	92.31	94.61	90.46	85.5	84.07	75.32	76.73	88.04	8.13
SCB	70.2	71.27	56.75	70.11	66.45	62.2	56.88	48.92	56.87	62.18	7.82
NIC	86.26	91.65	85.75	84.55	86.3	83.7	85.62	81.03	82.93	85.31	2.95
MBL	91.38	82.69	82.94	89.45	89.45	90.38	90.5	85.17	86.78	87.64	3.35
PCBL	93.65	89.23	88.97	89.15	87.53	89.12	85	81.63	81.76	87.34	3.90
KBL	87.14	90.99	92.19	90.11	89.55	87.6	79.34	81	82.7	86.74	4.64
RBB	85.89	73.62	67.16	77.15	71.38	69.3	58.46	61.05	56.73	68.97	9.40
ADBL	89.17	92.93	85.84	93.62	95.64	92.9	95.46	93.77	94.8	92.68	3.21
MEAN	88.19	86.42	81.77	86.31	84.69	82.99	78.80	74.99	76.91		
S.D	7.18	8.33	11.29	7.50	9.07	9.68	12.69	12.98	12.23		

The Table 6 shows the loan and advance to total deposit ratio of ten commercial banks for nine consecutive .The mean value of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 83.49%, 81.03%, 88.04%, 62.18%, 85.31%, 87.64%, 87.34%, 86.74%, 68.97% and 92.68% respectively. In the banking industries mean value of this ratio has high of ADBL 92.68% it means this bank has higher capacity to provide a loan to its customer .and SCB has lower 62.18% ratio it means this bank provide less amount of loan to its customer. The standard deviation of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 6.88%, 7.18%, 8.18%, 7.82%, 2.95%, 3.35%, 3.90%, 4.24%, 9.40% and 3.21% respectively. It indicates that NIC has the lowest risk among them and RBB has higher risk due to not consistency in loan and advance to total deposit.

Again in fiscal year the mean value is higher in 2020 it means in this year bank provide higher loan and advance than other year. In 2015 bank were not able to provide loan as they prescribe by regulator .

And S.D value is higher in 2014 it means this year bank were not consistency in providing loans and in 2022 bank were consistency in providing loan.

Table 7

Interest spread ratio(%)

YEAR	2022	2021	2020	2019	2018	2017	2016	2015	2014	MEAN	S.D
HBL	3.76	3.32	3.77	4.47	4.7	4.44	4.59	4.35	4.54	4.22	0.45
EBL	2.83	3.24	3.59	4.29	4.72	4.48	4.89	4.76	5.69	4.28	0.85
NMB	4.05	2.92	3.68	3.54	3.45	3.89	4.31	4.19	4.11	3.79	0.42
SCB	3.2	3.88	3.63	4.45	5.06	5.01	4.64	5.27	7.09	4.69	1.07
NIC	4.4	3.25	4.18	5.02	3.6	3.49	3.36	3.19	4.46	3.88	0.61
MBL	3.86	4.16	4.39	4.33	3.91	3.85	4.32	3.62	4.32	4.08	0.26
PCBL	3.37	4.14	4.22	4.32	4.23	3.45	3.34	3.42	2.94	3.71	0.48
KBL	4.96	3.13	4.07	3.54	3.12	3.26	3.59	3.17	3.71	3.62	0.56
RBB	4.29	4.37	4.26	4.46	4.95	4.92	4.73	4.53	4.14	4.52	0.27
ADBL	4.37	4.37	4.44	4.68	5.46	5.87	7.15	6.97	6.24	5.51	1.05
MEAN	3.91	3.68	4.02	4.31	4.32	4.27	4.49	4.35	4.72		
S.D	0.64	0.56	0.33	0.46	0.78	0.83	1.10	1.16	1.25		

Table 7 shows the interest spread deposit ratio of ten commercial banks for nine consecutive years with their mean. The mean value of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 4.22%, 4.28%, 3.79%, 4.69%, 3.88%, 4.08%, 3.71%, 3.62%, 4.52% and 5.51% respectively. But ADBL and EBL are higher than others. It implies that ADBL and SCB is lending interest is higher from the borrowing than other banks. The standard deviation of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 0.45, 0.85, 0.42, 1.07, 0.61, 0.26, 0.48, 0.56, 0.27 and 1.05 respectively. It indicates that KBL(3.62) has the lowest risk among them and ADBL has higher risk (5.51).

In the given fiscal year 2016 there is higher so at that year bank were earn more profit. Similarly in 2021 bank has lower this ratio it means bank able to earn less profit. The S,D is higher in 2014 it means bank were more profit position in that year.

Table 8*Return on assets (ROA)%*

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	MEAN	S.D
HBL	0.3	0.5	0.5	0.6	0.5	0.4	0.4	0.4	1.3	0.54	0.28
EBL	1.13	0.89	1.42	1.94	1.97	1.72	1.61	1.85	2.25	1.64	0.41
NMB	1.35	1.32	1.09	1.83	1.96	1.77	1.54	1.77	1.41	1.56	0.27
SCB	0.53	0.27	0.09	0.32	0.16	1.83	1.98	2.01	2.5	1.08	0.92
NIC	0.25	0.07	0.24	0.34	0.87	1.38	1.52	1.53	1.58	0.86	0.61
MBL	0.94	1.01	1.02	1.61	1.47	1.89	1.51	1.26	1.12	1.31	0.31
PCBL	1.76	1.71	1.48	2.15	1.82	1.89	2.05	1.63	1.46	1.77	0.22
KBL	1.22	1.04	0.76	1.17	1.27	0.97	1.72	0.89	1.07	1.12	0.26
RBB	1.29	1.1	0.88	1.13	2.35	1.33	1.52	3.22	1.36	1.58	0.70
ADBL	0.9	1.59	1.86	2.77	2.71	2.54	2.2	3.46	1.72	2.19	0.72
MEAN	0.97	0.95	0.93	1.39	1.51	1.57	1.61	1.80	1.58		
SD	0.49	0.54	0.56	0.82	0.81	0.59	0.49	0.94	0.47		

Table 8, shows the return on assets of ten commercial banks for nine consecutive years with their mean. The mean value of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 0.54%, 1.64%, 1.56%, 1.08%, 0.86%, 1.31%, 1.77%, 1.12%, 1.58% and 2.19 % respectively. In this sample bank ADBL is providing more ROA (2.19) it means ADBL is utilizing more efficiently of its assets. And bank HBL has less ROA (0.54) it means this bank is not utilizing its assets properly. The S.D of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 0.28%, 0.41%, 0.27%, 0.92%, 0.61%, 0.31%, 0.31%, 0.22%, 0.26%, 0.70% and 0.72% respectively. It shows bank SCB has higher S.D (0.92%). It means this bank has higher deviation in ROA over the year likewise bank PCBL has lower S.D (0.22%) it means this bank has more consistency in ROA.

Again in the fiscal year mean value is higher in 2015 (1.80%) it means in this year bank has less in their utilizing their assets. And in the fiscal year 2019-20 (0.93%) it means in this year average banks were more in providing return from their assets. In the S.D value in 2015 is higher (0.94%) it means in this year bank were not consistency in ROA. And lower value in 2014 (0.47%) it means in this fiscal year bank were more consistency in providing ROA.

Table 9*Cost per loan(%)*

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	MEAN	S.D
HBL	1.78	2.21	2.53	2.67	2.54	2.83	2.53	3.24	3.71	2.67	0.56
EBL	1.9	1.8	2.17	2.24	2.3	2.2	1.92	2.28	2.22	2.11	0.19
NMB	2.17	2.06	3.19	3	2.33	2.32	1.87	1.84	2.01	2.31	0.48
SCB	5.25	3.18	3.4	3.66	8.53	8.05	10.83	3.29	3.27	5.50	2.90
NIC	0.97	0.66	1.03	1	2.42	2.17	1.8	2.07	2.09	1.58	0.66
MBL	2.59	2.43	2.69	2.69	2.17	2.16	2.06	2.22	2.29	2.37	0.24
PCBL	1.61	1.67	1.38	1.75	1.3	1.32	1.12	1.26	1.31	1.41	0.21
KBL	2.24	2.21	1.54	1.74	2.02	1.82	1.97	2.05	2.01	1.96	0.22
RBB	2.21	2.33	0.5	0.6	3.29	3.33	4.05	6.09	5.06	3.05	1.88
ADBL	2.92	3.13	3.4	3.59	3.88	4.35	4.75	5.31	7.05	4.26	1.30
MEAN	2.36	2.17	2.18	2.29	3.08	3.06	3.29	2.97	3.10		
S.D	1.15	0.72	1.03	1.03	2.04	1.95	2.87	1.57	1.76		

Table 9, shows the cost per loan of ten commercial banks for nine consecutive years with their mean. The mean value of HBL, EBL, ,SCB,NIC, MBL, PCBL, KBL, RB Band ADBL are 2.67%, 2.11%, 2.31%, 5.50%, 1.58% 2.37%,1.41%,1.96%,3.05%,4.26% respectively. the mean value is higher in ADBL (4.26%) it means this bank has a higher operating cost incurred in while providing loans to costumer which decreased a profit of bank. and bank PCBL is a lowest mean value (1.41%)it means this bank has lowest operating cost incurred while providing loan to costumer it helps in increasing profit. .The S.D value of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 0.56%, 0.19%, 0.48%, 2.90%, 0.66%, 0.24%, 0.21%, 0.22%, 1.88% and 1.30% respectively. The S.D value is higher of RBB(1.88%) in the given fiscal year. It means RBB is not consistency in cost in providing loans to costumer .and EBL is lowest value of S.D (0.19%) it means this bank has consistency in cost to providing loan to costumer. In above table fiscal year 2017-18 is higher mean value (3.08%) it means in this fiscal year banks had a high operating cost in managing loans provide likewise in fiscal year 2021-22 is lowest (2.17%)it means banks had lowest cost incurred while providing loans to costumer. again the value of S.D is higher in fiscal year 2017 (1.95%) means in this year

banks were not consistency in cost while providing loans .and in fiscal year 2021(0.72%) means in this year banks management is excellent in managing in cost while providing loans.

Table 10

Solvency ratio (%)

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	MEAN	S.D
HBL	16.7	14.34	20.74	13.51	15.04	16.79	8.91	11.41	8.57	14.00	3.94
EBL	22.5	25.06	22.81	24.4	27.96	22.49	24.66	30.23	21.21	24.59	2.89
NMB	23.7	21.18	21.95	20.82	14.65	16.51	15.36	16.97	16.87	18.67	3.26
SCB	36.9	33.23	47.82	32.99	46.02	33.74	17.86	41.1	37.04	36.30	8.79
NIC	10.2	11.5	15.4	21.4	17.4	19	13.8	12.5	16	15.24	3.65
MBL	13.2	15.1	17.18	15.01	21.02	15.27	11.56	14.27	10.45	14.78	3.10
PCBL	13.3	14.44	16.45	16.5	18.79	20.97	16.19	16.15	21.35	17.13	2.74
KBL	16.2	14.33	13.58	14.98	14.47	19.75	11.89	14.79	17.62	15.29	2.31
RBB	12.6	13.59	10.86	11.05	9.92	13.3	17.97	17.88	22.38	14.39	4.15
ADBL	13	15	18.15	16.27	18.65	22.19	12.12	14.71	13.31	15.93	3.24
MEAN	17.83	17.77	20.49	18.69	20.39	20.00	15.03	19.00	18.48		
S.D	7.99	6.75	10.29	6.43	10.19	5.69	4.47	9.35	7.99		

Table 10 shows the solvency ratio of ten commercial banks for nine consecutive years with their mean. The mean value of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 14.00%, 24.59%, 18.67%, 36.30%, 15.24%, 14.78%, 17.13%, 15.29%, 14.39% and 15.93% respectively. The mean value is maximum of SCB .it shows the result of effective credit management of the bank and its efforts proper utilizing liquid assets . The standard deviation of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 3.94, 2.89, 3.26, 8.79, 3.65, 3.10, 2.74, 2.31 4.15 and 3.24 among those value of SCB is higher it means this bank is more risky among them .

In the given fiscal year mean value is higher in the 2018 it means in this year bank has effective management of credit .and S.D value is higher in 2020 in this year bank has not consistency in solvency managing.

Table 11*Net interest margin(%)*

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	MEAN	S.D
HBL	2.28	2.12	3.04	3.72	3.65	3.59	3.4	3.15	4.01	3.22	0.61
EBL	2.29	1.82	2.87	3.35	3.36	3.25	2.83	2.9	4.19	2.98	0.64
NMB	1.32	2.44	3.06	3.12	2.59	3.09	2.76	2.19	2.65	2.58	0.54
SCB	0.92	0.82	0.86	1.06	1.13	2.83	2.83	2.94	3.76	1.91	1.09
NIC	0.98	0.76	0.82	0.73	2.26	2.44	2.46	2.61	3.49	1.84	0.97
MBL	2.72	2.75	3.1	3.37	3.23	3.42	3.12	2.78	2.74	3.03	0.27
PCBL	0.73	3.12	3.04	0.97	0.87	2.48	3.12	3.03	2.75	2.23	0.99
KBL	2.93	2.67	2.44	2.72	2.42	1.87	2.73	1.87	2.62	2.47	0.35
RBB	2.81	2.64	0.88	1.13	4.82	3.96	3.18	3.18	2.67	2.81	1.17
ADBL	3.93	3.08	1.04	1.52	4.9	5.44	5.6	5.56	5.82	4.10	1.73
MEAN	2.09	2.22	2.12	2.17	2.92	3.24	3.20	3.02	3.47		
S.D	1.06	0.85	1.06	1.19	1.36	0.99	0.88	0.99	1.03		

Table 11 shows the net interest margin of ten commercial banks for nine consecutive years with their mean. The mean value of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 3.22%, 2.98%, 2.58%, 1.91%, 1.84%, 3.03%, 2.23%, 2.47%, 4.81% and 4.10% respectively. the mean value is higher (4.10%) of the ADBL it means this bank has earned more interest income than other income .and lowest mean value is NIC ASIA(1.84%) it means this has earned less income from interest income out of total assets .The S.D value of HBL, EBL, NMB, SCB, NIC, MBL, PCBL, KBL, RBB and ADBL are 0.61%, 0.64%, 0.54%, 1.09%, 0.97%, 0.27%, 0.99%, 0.35%, 1.17% and 1.73% respectively the S.D value is higher of SCB(1.09) which means this bank has not consistency in earning interest income .and bank KBL has lowest S.D value it means this bank has consistency in earning interest income.

In the given fiscal year the mean value is higher 2017 it means in this year bank earn more interest income than other year likewise in the fiscal year 2022 bank has earned less amount of interest income than other year. The S.D value is higher in the 2018 it means in this year bank has less consistency in earning interest income .and in 2021 bank has more consistency in earning interest income than other fiscal year

4.1.1 Descriptive Statistics

The descriptive statistics for dependent and independent variables for fiscal year 2014 to 2022 in panel of 90 observation containing 10 sample banks has been presented in Table 4.1. ROA,ROE,NIM is the dependent variables. The average ROA of sample banks as a whole is Rs 1.37, median of ROA is Rs 1.395, minimum is Rs 0.07, and maximum is Rs 3.46 with standard deviation is Rs 0.70. The average ROE of 20 sample banks as a whole is Rs 16.96, median of ROE is Rs 15.4, minimum is Rs3.83, and maximum is Rs76.96 with standard deviation of Rs 10.46 .

Table 12

Descriptive Statistics

	Mean	Median	Maximum	Minimum	St.Dev	Obv.
ROA	1.37	1.395	3.46	0.07	0.70	90
ROE	16.96	15.4	76.96	3.83	10.16	90
NIM	2.72	2.77	5.82	0.73	1.14	90
CAR	13.97	13.37	22.99	4.62	2.92	90
CPL	2.72	2.23	10.83	0.5	1.67	90
INT_SPRE	4.23	4.245	7.15	2.83	0.86	90
L_A	82.34	85.4	96.69	48.92	10.77	90
NPL	1.88	1.115	23.23	0.06	2.71	90
SOL	18.27	16.36	47.82	8.57	7.17	90

Note: ROA= return on assets, ROE= return on equity ,NIM= net interest margin CAR= capital adequacy ratio, CPL=cost per loan, INT_SPRE= interest spread L_A= loan and advance to total deposit ,NPL= non performing loan. SOL= solvency ratio Obv.=No of observation

The average NIM of sample bank is 2.72 and maximum is Rs 5.82 and minimum is Rs 0.73 with stander deviation is Rs 1.14 and median is 2.77. The average CAR of sample bank is 13.97 and maximum is Rs 22.99 and minimum is Rs 4.62 with stander deviation is Rs 2.99 and median is 13.37. The average CPL of sample bank is 2.72 and maximum is Rs 10.83 and minimum is Rs 0.5 with stander deviation is Rs 1.67 and median is 2.23. The average INT_SPRE of sample bank is 4.23 and maximum is Rs 7.15 and minimum is Rs 2.83 with stander deviation is Rs 0.86 and median is 4.245. The average L_A of sample bank is 82.34 and maximum is Rs 96.69 and minimum is Rs 48.92 with stander

deviation is Rs 10.77 and median is 85.4 . The average NPL of sample bank is 1.88 and maximum is Rs 23.23 and minimum is Rs 0.06 with stander deviation is Rs 2.71 and median is 1.115. The average SOL of sample bank is 18.27 and maximum is Rs 47.82 and minimum is Rs 8.57 with stander deviation is Rs 2.17 and median is 16.36 . The average SOL of sample bank is 18.27 and maximum is Rs 47.82 and minimum is Rs 8.57 with stander deviation is Rs 7.17 and median is 16.36.

4.1.2 Correlation analysis

This table reveals the correlation coefficients between Dependent variable and independent variable mention in above table. dependent variable is ROA(return on assets),ROE(return on equity),NIM (net interest margin) and independent variable is CAR (capital adequacy ratio),CPL (cost per loan), INT_SPRE(interest spread),L_A (loan and advance to total deposit)

NPL (net performing loan),SOL (solvency ratio). The correlation coefficients are based on the data on ROA,ROE,NIM,NPL,CAR,CPL,SOL,and INT_SPRE, from 10 sample banks with 90 observations for the period 2014 to 2022.

Table 13

Correlation coefficient

[illegible]

Note: ROA= return on assets, ROE= return on equity ,NIM= net interest margin. CAR= capital adequacy ratio, CPL=cost per loan, INT_SPRE= interest spread , L_A= loan and advance to total deposit ,NPL= non performing loan. SOL= solvency ratio Obv.=No of observation

Note: Figures in the brackets are P-values

Table 13 shows the Correlations Analysis. CAR is positive significantly with a ROA. it means if the bank maintain higher the CAR will increase it's profit from assets. CPL is positively significant with ROA . it means if bank increase in cost per loan than bank's ROA will also increase .INT_SPRE is highly significant with ROA .it indicate that when you increase interest spread rate than ROA also increase of banks. L_A is positively correlated with ROA It means when bank increase loans to customer the ROA will increase due to the interest income. NPL is positive correlated with ROA it means increase in NPL will increase in ROA due to other factor than NPL .SOL is negatively correlated with ROA it means when you increase in debt and equity it will increase ROA.

(ROE) means return on equity . CAR is negative correlated with ROE it means when you hold more money for CAR it will decrease profit of equity holder. CPL is positive correlated with ROE it means when you increase cost per loan it will also increase profit of equity. INT_SPRE is also positive significant with ROE it means when bank increase interest spread return of equity will increase. Loan and advance to total deposit ratio is negatively correlated with ROE it means when you provide more loan it will decrease return on equity due to bad loans. NPL is positively correlated with ROE .it means when non performing loan increase it will lead the profit of equity holder. SOL is also positively correlated with ROE it means when increase debt and equity structure it will lead profit of equity.

NIM(net interest margin) is the portion of income form interest income. CAR is negatively correlated with NIM . it means when a bank increase a CAR it will shortage a loanable fund and interest income will decrease. CPL is positively correlated with NIM .it means when bank increase cost per loan or increase loan amount it will lead increase in interest income of bank .INT_SPRE is highly positive with NIM it means when spread is increase interest in loan also increase this will lead increase in NIM. Loan and advance to total deposit ratio is positively correlated with NIM . it means when you provide more loan from total deposit it will also obviously increase then interest income. NPL is

positively correlated with NIM it means when non performing loan increase as it increasing loan amount it will increase interest income. SOL is negatively correlated . it means when increase debt/equity in company it will increase in interest income.

4.2 Regression Analysis

Regression analysis is the statistical tool, with the help of which we can predict the unknown value of one variable from known value of any other variable. The regression analysis is carried out to determine whether the dependent variable is influenced by the given independent variables or not. In panel regression testing, there are three models of regression analysis, namely Pooled Ordinary least square model, Fixed Effect and Random Effect. These three models need to be analyzed to determine the most appropriate model in predicting the company's credit risk. To take appropriate result, two types of tests are used, i.e., Likelihood Ratio test and Hausman test to take effective data analysis.

Fixed effect models for ROA

Fixed effects model is a statistical regression model in which the intercept of the regression model is allowed to vary freely across individuals or groups. It is often applied to panel data in order to control for any individual-specific attributes that do not vary across time. The fixed effects represent the effects of variables that are assumed to have a constant effect on the outcome variable, while the random effects represent the effects of variables that have a varying effect on the outcome variable across groups or individuals. Fixed-effects models are a class of statistical models in which the levels (i.e., values) of independent variables are assumed to be fixed (i.e., constant), and only the dependent variable changes in response to the levels of independent variables.

Table 14*Test for OLS model, fixed effect model, Random method ROA*

Panel A: Redundant Fixed Effects Tests				Panel B: Hausman Test			
Effects Test	Statistic	d.f.	Prob	Test Summary	Chi-Sq. Statistic	Chi-Sq.	Prob
Cross-section F	6.177	(9,74)	0	Cross-section random	36.64	6	0
Chi-square	50.432	9	0				

In the above table at first redundant effect fixed for OLS and fixed effect model here is null hypothesis is OLS is better method here value of P is <0.05 this hypothesis is rejected and fixed effected model is appropriate. again for the test of fixed model or random we test husman test and here is null hypothesis is random effect is better so there the value of P <0.05 so this hypothesis is rejected and fixed effect is better so we will describe ROE as per fixed effect model.

Table 15*Result of fixed effect model*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	0.094	0.025	3.751	0.0003
L_A	-0.009	0.009	-1.014	0.3139
INT_SPRE	0.283	0.080	3.546	0.0007
CPL	0.033	0.048	0.687	0.4938
CAR	0.014	0.029	0.486	0.6281
SOL	0.002	0.013	0.175	0.8614
C	0.463	1.053	0.439	0.6616
R-squared		0.606		
Adjusted R-squared		0.526		
F-statistic		7.606		
Prob(F-statistic)		0.000		

Note: NPL= Non performing loan ,INT_SPRE= interest spread ,L_A= loan and advance to total loan ,CPL= cost per loan ,CAR= capital adequacy ratio, SOL= solvency ratio. ROA= return on assets R^2 = Coefficient, F= F-Statistic.

**. Regression is significant at the 0.01 level.

*. Regression is significant at the 0.05 level

Table 15, shows the relation between dependent variable with independent variable through fixed effect regression model. In Table 4.1 there is positive relationship between all independent variable and dependent variable except L_A . As per correlation coefficient Rs 1 change in ROA is Rs0.094, if Rs1increase in L_A than ROA will decrease by Rs0.009,if Rs1 increase in INT_SPRE than ROA will increase by Rs0.283,if Rs 1increase in CPL ROA will increase by 0.033,if Rs1 increase in CAR Rs0.014 increase in ROA.if Rs1 increase in SOL than Rs0.02 increase in ROA. The significance levels of all independent variable are more than 0.05 except NPL, INT_SPRE which means the chances of error is high and we will not considered the regression result for particular variable having probability value more than 0.05. If chances of error or probability is less than 5% or 0.05 it means regression result are considerable and variable is significant. The stander error of NPL is 0.025% which means the value of ROA is affected by NPL is 99.975% and rest is other factor. The stander error of INT_SPRE is 0.80% it means INT_SPRE is affecting ROA by 99.2% and rest is affected by other things.

The F-square of above data is 60.6% it means 60,6% variation on ROA is from its independent variable remaining portion will be explain by other factor than considered variable. the adjusted R-squared is more appropriate in reliable result with the help of degree of freedom which indicate 52.6% variation on ROA is explain by its independent variable rest is explain by other factor .

F-Statistic shows the combine effect on all independent variable on dependent variable if probability of F-stats greater than 5% or 0.05 it means chances of error is high and we can conclude that combine effect is insignificant and vice-versa. In this study f-stat value is 0.0000 which means the combine effect of all independent variable on dependent Variable.

The probability value of NPL ,IN_SPRE is less than 0.05 thus the NPL ,IN_SPRE is significantly correlated with ROA

Table 16*Test for OLS model, fixed effect model, Random method ROE*

Panel A: Redundant Fixed Effects Tests				Panel B: Correlated random effects-husman test			
Effect test	Statistic	d.f	Prob.	Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section F	2.32	9.7	0.0229	Cross-section random	12.28	6	0.055
Chi-square	2.42	9	0.0076				

In the above table at first redundant effect fixed for OLS and fixed effect model here is null hypothesis is OLS is better method here value of P is <0.05 this hypothesis is rejected and fixed effected model is appropriate. again for the test of fixed model or random we test husman test and here is null hypothesis is random effect is better so there the value of P >0.05 so this hypothesis is accepted and random effect is better so we will describe ROE as per random effect model.

Table 17*Result of Random effect model*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.009	0.332	-0.028	0.9775
L_A	-0.277	0.110	-2.520	0.0137
INT_SPRE	2.013	1.090	1.846	0.0684
CPL	1.312	0.648	2.024	0.0461
CAR	-1.756	0.3510	-5.003	0
SOL	0.060	0.1494	0.4036	0.6875
C	51.19515	11.673	4.3855	0
R-squared	0.393			
Adjusted				
R-squared	0.350			
F-statistic	8.990			
Prob(F-statistic)	0.000			

Note: NPL= Non performing loan, INT_SPRE= interest spread, L_A= loan and advance to total loan, CPL= cost per loan ,CAR= capital adequacy ratio, SOL= solvency ratio. ROA= return on assets R^2 = Coefficient, F= F-Statistic.

**. Regression is significant at the 0.01 level.

*. Regression is significant at the 0.05 level

Table 17, shows the relation between dependent variable with independent variable through fixed effect regression model. In Table 4.2 there is positive relationship between all independent variable and dependent variable except L_A ,NPL, CAR. which means INT_SPRE, CPL SOL is positive impact on ROA and other variable L_A will decrease in ROE Rs 0.277, If Rs1 increase in INT_SPRE it will increase by Rs 2.013,If Rs 1 increase in CPL will increase in ROE by 1.312 ,if Rs1 increase by CAR it will decrease by Rs1.756,if Rs1 increase in SOL will increase in ROE by Rs0.060. The significance levels of all independent variable are more than 0.05 except L_A, CPL,CAR which means the chances of error is high and we will not considered the regression result for particular variable having probability value more than 0.05. . If chances of error or probability is less than 5% or 0.05 it means regression result are considerable and variable is significant. the stander error of L_A is 0.11% which mean value of ROE is affected 99.89% is by NPL rest is by other factor .again the stander error of CPL is .64% which means ROE is affected 99.36% is by CPL rest is other factor . and the stander error of CAR is 0.35% which means the value of ROE is affected 99.65% is by CPL and rest is other factor.

The R-square of above data is 39.3% which means 39.3% is variation from its independent variable and rest is other factor . The adjusted R-squared is more appropriate in reliable result with the help of degree of freedom. Which indicate 52% variation on ROE is by its independent variable and rest is other factor.

F-Statistic, shows the combine effect on all independent variable on dependent variable If probability of F-stats greater than 5% or 0.05 it means chances of error is high and we can conclude that combine effect is insignificant and vice-versa. In this study f-stat value is 0.0 which means the combine effect of all independent variable on dependent. The probability value of L_A, CPL, CAR is less than 0.05 which means this independent variable is significantly correlated with ROE.

Table 18*Test for OLS model, fixed effect model, Random method NIM*

Panel A: Redundant Fixed Effects Tests				Panel B: Correlated random effects-husman test			
Effect test	Statistic	d.f	Prob.	Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section F	2.20	9.74	0.0312	Cross-section random	9.42	6	0.151
Chi-square	21.35	9	0.0112				

In the above table at first redundant effect fixed for OLS and fixed effect model here is null hypothesis is OLS is better method here value of P is <0.05 this hypothesis is rejected and fixed effected model is appropriate. Again for the test of fixed model or random we test hausman test and here is null hypothesis is random effect is better so there the value of P >0.05 so this hypothesis is accepted and random effect is better so we will describe ROE as per random effect model.

4.1.1.3 Random effect models for NIM

Table 19*Result of Random effect model*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	0.031	0.036	0.860	0.3919
L_A	0.032	0.012	2.592	0.0113
INT_SPRE	0.660	0.120	5.473	0
CPL	0.233	0.071	3.278	0.0015
CAR	-0.116	0.038	-2.992	0.0036
SOL	0.0007	0.016	0.044	0.9643
C	-1.80933	1.327192	-1.36328	0.1765
R-squared		0.407		
Adjusted R-squared		0.364		
F-statistic		9.515		
Prob(F-statistic)		0		

Note: NPL= Non performing loan ,INT_SPRE= interest spread ,L_A= loan and advance to total loan ,CPL= cost per loan ,CAR= capital adequacy ratio, SOL= solvency ratio. ROA= return on assets R^2 = Coefficient, F= F-Statistic.

**. Regression is significant at the 0.01 level.

*. Regression is significant at the 0.05 level

Table 4.3, shows the relation between dependent variable with independent variable through fixed effect regression model. In Table 4.2 there is positive relationship between all independent variable and dependent variable except ,CAR. Which means increasing in independent variable will increase its dependent variable except CAR . if Rs1ie increasing in the NPL will increase in NIM by Rs0.031, if Rs1 is increase in L_A it will increase in NIM by Rs0.032 if Rs1 increase in INT_SPRE will increase in NIM by Rs0.660,if Rs1 increase in CPL it will increase in NIM by Rs 0.233.if Rs1 increase in CAR will decrease in NIM by Rs0.166,if the SOL increase Rs1 will increase in NIM by Rs0.0007. The significance levels of all independent variable are more than 0.05 except L_A, INT_SPRE ,CPL,CAR which means the chances of error is high and we will not considered the regression result for particular variable having probability value more than 0.05. . If chances of error or probability is less than 5% or 0.05 it means regression result are considerable and variable is significant.the stander error of L_A 0.012% which means 99.988% affected by L_A on NIM and rest is affected by other .the stander error of INT_SPRE is 0.12% which means 99.88% affected by INT_SPRE on NIM and rest is affected by other factor.the stander error of CPL is 0.71% which means 99.29% is affected by CPL on NIM and rest is other factor .the stander error of CAR is 0.38% which means 99.62% is affected by CAR and rest is other factor

The R-square of above data is 40.7% which means 40.7% is variation from its independent variable and rest is other factor . the adjusted R-squared is more appropriate in reliable result with the help of degree of freedom. Which indicate 36.4% variation on NIM is by its independent variable and rest is other factor.

F-statistic, shows the combine effect on all independent variable on dependent variable If probability of F-Stats greater than 5% or 0.05 it means chances of error is high and we can conclude that combine effect is insignificant and vice-versa. In this study f-stat value is 0.0 which means the combine effect of all independent variable on dependent. The probability value of L_A, INT_SPRE ,CPL,CAR is less than 0.05 which means this independent variable is significantly correlated with NIM.

4.2 Discussion

Based on descriptive analysis of sample banks. ROA is found to be fluctuating between Rs.3.6 to Rs.0.07 with mean of Rs.1.37, ROE is found to be fluctuating between Rs.76.96 to Rs.3.83 with mean of Rs.12.96, NIM is found to be fluctuating between Rs.5.82 to Rs.0.73 with mean of Rs.2.72. CAR is found to be fluctuating between Rs.22.99 to Rs.4.62 with mean of Rs.13.97. CPL is found to be fluctuating between Rs.10.83 to Rs.0.5 with mean of Rs.2.72. INT_SPRE is found to be fluctuating between Rs.7.15 to Rs.2.83 with mean of Rs.4.23. L_A is found to be fluctuating between Rs.96.69 to Rs.48.92 with mean of Rs.82.34. NPL is found to be fluctuating between Rs.23.23 to Rs.0.06 with mean of Rs.1.88. SOL is found to be fluctuating between Rs.47.82 to Rs.8.57 with mean of Rs.18.27.

Based on the results of correlation between dependent variable and independent variables, there is a positive correlation of ROA with CPL, CAR, INT_SPRE, L_A, NPL and negative correlation with SOL. Aging there is positive correlation of ROE with CPL, INT_SPRE, L_A, NPL, SOL and negative correlation with CAR. Aging there is positive correlation of NIM with CPL, INT_SPRE, L_A, NPL, and negative correlation with CAR, SOL.

Based on the regression analysis for ROA there is suitable model is fixed effected model. Under this model only NPL, INT_SPRE, is a significant other were insignificant. It means NPL, INT_SPRE variable were significantly affected the ROA. This finding is consistent with the findings of Shiva raj poudel (2018), Samuel Hymore Boahene^{1*} Dr. Julius Dasah² Samuel Kwaku Agyei (2012), Ghaith N. Al-Eitan (2019), Fauziah Hanim Tafri, Zarinah Hamid, Ahamed Kameel Mydin Meera, and Mohd Azmi Omar (2009), TIEBU TEFERA (2011), Hambolu, Victor Olufunsh (2022).

Based on the regression analysis for ROE there is suitable model is Random effected model. Under this model there is positive relationship between all independent variable and dependent variable except L_A, NPL, CAR. And there is significant with L_A, CAR, CPL which means these variable were significantly affected a ROE. This finding is consistent with the finding of Shiva raj poudel (2018), Samuel Hymore Boahene^{1*} Dr. Julius Dasah² Samuel Kwaku Agyei (2012), TIEBU TEFERA (2011), Fauziah Hanim Tafri, Zarinah Hamid, Ahamed Kameel Mydin Meera, and Mohd Azmi

Omar(2009), Abu Hanifa Md. Noman, Sajeda Pervin, Mustafa Manir Chowdhury & Hasanul Banna(2015), Sita Bagale(2023), Devi Bhandari(2019) ,Million Gizaw(2015).

Based on the regression analysis for NIM there is suitable model is Random effected model .under this model there is positive relationship between all independent variable and dependent variable except CAR .again there is positively significant NIM with L_A, INT_SPRE,CPL,CAR which means these variable were significantly influencing the value of NIM . This finding is consistent with the finding of By Abu Hanifa Md. Noman, Sajeda Pervin, Mustafa Manir Chowdhury & Hasanul Banna (2015).

To analysis for which method is better for the regression analysis of above data we tested the Hausman test for OLS , fixed and Random model for ROA,ROE NIM we concluded that fixed effect method is better for ROA and Random effected model is better for both ROE,NIM.

CHAPTER V

SUMMARY AND CONCLUSION

The purpose of this chapter to present an overview of the study in the summarized from along the major findings and conclusion of the study. Accordingly, it is organized in three sections.

5.1 Summary

This study has examined factors that affecting the credit risk i.e., non-performing loan ratio, solvency ratio, capital adequacy ratio, and loan and advances to total deposit ratio and interest spread ratio on profitability i.e., return on equity ,return on assets ,net interest margin. This study is categorized into five chapters. The first chapter deals with the background of the study, statement of problem, objective of study, significance of the study, theoretical framework, and limitation of the study. The second chapter deals with the review of related literatures and available studies, written and prepared by experts and researcher related to credit risk and profitability. The third chapter deals with the research methodology which present the methodology used in this study. It deals with research design, population, sample size calculation, sampling technique, nature and sources of data, data collection procedure and tools used for data analysis. The descriptive research design adopted for the study. The annual data have been used for descriptive statistics of ten years and they are from 2014 to 2022. The study targeted ten commercial banks in Nepal. The fourth chapter fulfills the objectives of the study by presenting the data and analyzing them with the help of various statistical tools and techniques followed by methodology. Major focused of the study on factors that affecting the credit risk on profitability of commercial banks with specific objectives. To meet the objectives of the study, it uses the various statistical tools: Mean, Standard deviation, Coefficient of correlation, regression analysis ,p-value, fixed effect model ,random effected model . The fifth chapters summarize the whole study. Moreover, the fifth chapter covers conclusion and recommendations.

The general objectives of the study were to find out the relationship between credit risk and profitability of banks and specific objectives were to establish impact of non-performing loan ratio, solvency ratio, capital adequacy ratio, loan and advances to total

deposit ratio and interest spread rate on banks profitability. The result showed that credit risk is an important predictor of bank profitability thus success of bank profitability depends on credit risk management.

5.2 Conclusion

Based on the findings the following conclusion has been made regarding the impact of different independent variables on banks performance. For the return on assets solvency ratio shows the negative relationship and other variable were positive relation again for the return on equity capital adequacy ratio and loan and advance to total deposit ratio is negative relation other were positive relation again for net interest margin capital adequacy and solvency ratio is negative correlation and other were positively correlated Among them capitaladequacy ratio has highly impact on profitability than other variables. This study concludesthat the credit risk (non-performing loan ratio, cost per loan ,loan and advance to total deposit ratio solvency ratio, and capital adequacy ratio) is an important predictor for the profitability of the bank. Therefore, the success of the bank in term of profitability depends on its credit risk. The study thus recommends an effective manage the credit risk for commercial banks of Nepal based that maintains an optimum level of capital adequacy ratio, controls and monitors non- performing loan and loan and advance to total deposit for financial performance. Thus, credit risk has significant impact on the profitability of Nepalese commercial banks

5.3 Implications

On the basis of the conclusion of this study, the following implications are mentioned for various stakeholders.

This study is based on secondary data about credit risk and its impact on profitability of Nepalese commercial banks. Most of the banks are facing number of risks on day-to-day activities such as credit risk, operation risk, market risk, liquidity risk, interest risk, foreign exchange risk. Among those risks which have been faced by banks, the credit risk plays the significant role on its financial performance.

In context of Nepal, commercial banks are facing difficulties over the past years due to the relaxed credit standard, poor portfolio risks management, unbalance solvency position and loan approvals without proper examination which increases the non-performing loan. So, this study helps to find out the real problems in implementation of credit risk for commercial bank in Nepal and it also helps in following areas:

- This study helps for Nepalese banking industry to ensure that the effective strategy is being implemented to minimize risk for expanding market and financial return.
- This study helps for all stakeholders to know the financial performance and risk management conditions of Nepalese commercial banks.
- Good liquidity position is very necessary for all commercial banks as it should be enough to meet the depositor's obligations as well as for good investment and for expansion.
- Bank should be sensitive to adverse movements in external factors such as interest rates, exchange rate and commodity prices as it has direct disruption on cash trends of the bank.
- At last, it would be important to all sample banks to know about the financial performance and condition of risk management.

In addition, the suggestion for further research can be presented in following research area:

- Relationship between financial risk management and financial performance of Nepalese bank by focusing on operational risk management, liquidity risk management, interest risk management, foreign exchange risk management and more.
- Another research area can be inclusion like development bank, finance company, micro finance company which is successfully operated in Nepalese market.
- The researchers can study on the other qualitative factors like ethical management, commitment and skill of management team.

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CREDIT RISK AND PROFITABILITY OF COMMERCIAL BANKS

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ABSTRACT Banking sectors is important sector in an economy; it works as smooth running of economy. But there are various investors are interesting to invest in common stock of banks. The market price of stock affects investment of investors. This study is conducted on impact of firm-specific and macroeconomic determinants of common stock price of sample bank. The main objectives of study are to identify the factors that affect to credit risk of commercial banks in Nepal. The study has been conducted on Descriptive and Causal comparative research design with sample size of 10 commercial bank over the period of 2014 to 2022 leading to total 90 observations. Secondary source of data are used for in study with random sampling method. The panel data analysis is used. Different statistical tools i.e., correlation and regression analysis have been used to analyze the data of sample development banks. In the study three type of regression are used. They are OLS, Fixed effect and Random effect model. To test these models, two test are applied i.e., Redundant fixed effect test and Hausman test. From the test, Random effect model is appropriate for NIM and ROE. fixed effect model is appropriate for ROA. The major finding of the study shows that earning per share (EPS) influence the investment in development banking common stock. This study suggest to investors, banks and further researchers. Keywords: Return on assets (ROA), Return on equity (ROE), Leverage, Panel Data, commercial Banks CHAPTER-I INTRODUCTION 1.1 Background of the Study

Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of the risk to a greater extent than any other risk. It is a risk of financial loss if a borrower or counterparty fails to honor commitments under an agreement and any such failure has an adverse effect on financial performance of the bank. Credit risk

8

is a when a lender lend money to a borrowed but may not be payback (Peterdy 2022) . It refers to the risk of default or non-payment or non-adherence to contractual obligations by a borrower. Credit risk mainly arises when borrowers are unable to pay due willingly or unwillingly. The revenue of banks comes primarily from interest on loans and accordingly, loans form a major source of credit risk (Bandyopadhyay 2016) . Banks face credit risks from financial instruments such as acceptances, interbank transactions, trade financing, foreign exchange transactions, futures, swaps, bonds, options, settlement of transactions, and others. The loss may be complete or partial. In an efficient market, higher levels of credit risk will be associated with higher borrowing costs. Because of this, measure of borrowing costs such as yield spreads can be used to infer credit risk levels based on assessment by market participants. To reduce the lender's credit risk, the lender may perform a credit check on the prospective borrower, may require the borrower to take out appropriate insurance such as mortgage insurance, or seek security over some assets of the borrower or a guarantee from the third party. The lender can also take out insurance against the risk or on-sell the debt to another company. In general, the higher the risk, the higher will be the interest rate that the debtor will be asked to pay on the debt. Profitability is composed of two words namely, profit and ability. The term profit has been explained above and the term ability indicates the power of a business entry to earn profits. The ability of a concern also denotes its earning power or operating performance. The profitability may be defined as the ability of a given investment to earn a return from its use (Chhetri 2021) . Profitability is a relative concept whereas profit is an absolute connotation. Profitability is ability of a company to use its resources to generate revenues in excess of its expenses. In other words, this is a company's capability of generating profits from its operations. Despite being closely related to and mutually interdependent profit and profitability are two different concepts. In other words, in spite of their generic nature, each one of them has a distinct role in business. As an absolute term, profit has no relevance to compare the efficiency of a business organization. A very high profit does not always indicate sound organizational efficiency and low