CREDIT RISK MANAGEMENT ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN NEPAL

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

by

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CERTIFICATION OF AUTHORSHIP

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

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

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REPORT OF RESEARCH COMMITTEE

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

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APPROVAL SHEET

We, undersigned, have examined the dissertation entitled "**Credit Risk Management on Financial Performance of Commercial Banks in Nepal**" presented by Samjhana Ghimire a candidate for the degree of Master of Business Studies (MBS Semester) and conducted the Viva-voce examination of the candidate. We hereby certify that the dissertation is worthy of acceptance.

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ABBREVIATIONS

CBL	:	Civil Bank Ltd.
CV	:	Coefficient of Variation
F/Y	:	Fiscal Year
GDP	:	Gross Domestic Product
KBL	:	Kumari Bank Ltd.
MBL	:	Machhapuchhre Bank Ltd.
NABIL	:	Nepal Arab Bank Price
NEPSE	:	Nepal Stock Exchange
NIC Asia	:	NIC Asia Bank Ltd.
PA	:	Per annum
R&D	:	Research and Development
SEBON	:	Security Board of Nepal
TU	:	Tribhuvan University

ABSTRACT

The relationship between credit risk and commercial banks performance has been the concern of emerging studies both in developed and developing countries. The overall purpose of this research is to examine and analyze how the selected commercial banks have managed mainly credit risk in this competitive Nepalese banking industry. The specific objective are; to analyze the credit risk position of Nepalese commercial banks, to analyze the indicators of credit risk management of Nepalese commercial banks, and to minimize the credit risks management present in the commercial banks on the basis of NRB guidelines. To fulfil objective of the study, among the 21 commercial banks, only 3 (Kumari Bank Ltd., Machhapuchhre Bank Ltd. and NIC Asia Bank Ltd.) commercial banks have been selected. The study is based on secondary sources of data from 2013/14 to 2022/23.

The study found that MBL has higher concentration risk than KBL and NIC Asia as MBL has extended more loans in few sectors than KBL and NIC Asia. KBL, MBL and NIC Asia has highest ratio in Metal and Electric Products and construction sector, which is 203.76%, 192.83% and 201.75% respectively. In this sector also, the ratio of KBL is higher than that of MBL and NIC Asia. There is wide range of differences in the ratio of different loan sectors of MBL than that of KBL and NIC Asia. Therefore, it is concluded that NIC Asia has higher credit risk or default risk than that of KBL and MBL in terms of its interest on loan. The study found that Total Capital fund to Risk Weighted Asset (RWA) of KBL, MBL and NIC Asia for 10 years. Sample banks have capital adequacy ratio higher than the statutory requirement in all 10 years. The average ratio of KBL, MBL and NIC Asia is 14.94%, 15.72% and 12.04 % respectively. This shows that MBL has slightly higher Capital Adequacy Ratio than KBL and NIC Asia, which signals that MBL is in a bit better position than KBL and NIC Asia. Correlation coefficient regarding PLL with ROA and ROE indicates that there is positive relationship between them but the result is not too sufficient that's why it is considered as significant. Regression coefficient of PLL is positive but the value is not significant at 5 percent level of significance. The value of multiple coefficient of determination (R2) is 0.829 in NIC Asia bank indicated that 82.9% of total variation in ROA of this bank is explained by independent variables and only 17.1% is explained by other variables. The t value of coefficient of CAR, LLPR, NPLR and CRR are statistically significant given model at 5% level of significance; therefore the regression equation could provide statistically significant explanation of variation in the ROA due to CAR, LLPR, NPLR and CRR.

Keywords: Credit Risk management, commercial banks, profitability, non-performing loan

CHAPTER I

INTRODUCTION

1.1. Background of Study

Credit is the amount of money lent by the creditors (banks) to the borrower either on the basis of security or without security. Credit and advances is an important item on the asset side of the balance sheet of commercial bank. Bank earns interest on credit and advances which is one of the major sources of income for banks. Bank prepares credit portfolio; otherwise it will not only effect debts but also affect profitability adversely. Credit is regard as the most income generating assets especially in commercial bank. It also regarded as the heart of commercial bank in the sense that, it occupies large volume of transactions. It covers the main part of investment. It is the main factor for creating profit and determining the profitability. It should affect the overall economy. While the commercial banks have faced difficulties over the years for a multitude of reasons, the major cause of serious financial problems continues to be directly related to credit standards for borrowers, poor portfolio risk management or lack of attention to change in the economic circumstances and competitive climate. The credit decision should be base on thorough evaluation of the risk conditions of the lending and the characteristics of the borrower (Varshney & Swaroop, 1994).

Credit risk is the risk of default on a debt that may arise from a borrower failing to make required payments. Credit risk is one of the most significant risks that banks face, considering that granting credit is one of the main sources of income in commercial banks. The management of the credit risk related to that credit affects the profitability of the banks (Kwadwo, 2020).

The main source of credit risk includes, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, direct lending, massive licensing of banks, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank. An increase in bank credit risk gradually leads to liquidity and solvency problems. Credit risk management

can be defined as identification, measurement, monitoring and control of credit risk arising from the possibility of default in loan payment (Nguyen, 2020).

Financial performance analysis is the process of determining financial strengths and weaknesses of a company by establishing strategic relationship between the components of a balance sheet and profit and loss statement and other operative data (Francis, 2002).

Financial performance of banks and other financial institution measured by using combination of financial ratio analysis, benchmarking, measuring performance against budget or mix of these methodologies. In simple accounting terms, performance of banks refers to the capacity in generating sustainable profitability. Banks need a way to evaluate performance and consider some important financial ratios and find the strength and weaknesses. The relationship between credit risk and commercial banks financial performance has been the concern of emerging studies both in developed and developing countries. The relationship between credit risk and commercial banks performance has been the concern of various studies that prove that credit risk is among the major factors affecting profitability performance of commercial banks (Varshney & Swaroop, 1994).

Credit risk management has been long the focus of government, regulatory authorities and financial institutions. Contemporary economic is basically a credit economy which has been based on the trusts of different entities. By trust, the lender has the ability that based on the repayment of book value and interest in a certain time or period, to received money, goods or service. Government bonds, enterprise loans, consumer loans, credit swap are typical examples of credit products (Yusuf, 2003).

The main focus of the study is to analyse the relationship of credit risk management practices, credit risk mitigation measures, financial performance and obstacles faced by banks with loan repayment behaviour of clients. This study can provide helpful information on policies and practices related to credit risk management being followed by commercial banks of Nepal, which ultimately helps understand scenarios related to credit risks faced by customers and commercial banks with cyclical and vicious impact. Thus, it has added value as scenario analysis of the credit risk management in banking sector in general along with complexities for managing credit

risks for the banking sector. The main issue of this study is the credit risk assessment in the financial institutions based on their internal efficiency, assessment of assets and borrowers. It also focuses on the policies for the credit risk mitigation as well as the problems being faced in credit risk management by Nepali commercial banks (Nepal Rastra Bank, 2017).

Credit administration is one of the significant activities of banks and non-bank financial institutions (NBFIs) in Nepal and the world at large. The NBFIs comprises of the Savings and Loans Companies, Financial Non-Governmental Organization (FNGOs), Money Lending companies, Finance Houses, Credit Unions, and microfinance companies. The large proportion that loans constitute in the overall operating assets of these lending institutions evidences their level of credit activities. However, managing a business and maintaining a continuous growth has become a challenge for managers of financial institutions in this era of market competition and economic fluctuations especially in developing countries such as Nepal. Considering the impact a healthy loan portfolio has on the lending institutions concerning liquidity, lending capacity, earnings, and profitability, managers of these firms have no other options than to consider and employ prudent credit-risk management practices in order to be profitable and remain sustainable.

Credit risk management has a primary goal to maximise a bank's risk-adjusted rate of return by maintaining credit risk and exposure within acceptable parameters. The part of a complete approach to risk management is essential to the long-term success of any banking institution. Banks across the globe increasingly face with credit risk in different financial instruments other than loans, which include trade financing, foreign exchange transaction, inter bank transactions, financial futures, and in the extension of commitments and guarantees.

The problem of credit risk management, as well as carrying out a quantitative assessment and analysis of the credit risk and rating of borrowers, is relevant to all banks involved in lending to individuals and legal entities. In general, when commercial banks grant loans to individuals and legal entities, the credit risk involved is characterized by the following quantitative parameters: risk as the probability of the borrower's failure to repay the loan; acceptable risk; average risk; possible losses

given loan default; the average value of losses; the maximum allowable losses; the number of loans given by the bank; the possible number of different loans the bank can give; the number of problem loans.

The management of credit risk of credit portfolios is therefore one the most important tasks for the financial liquidity and stability of banking sector in connection with increased sensitivity of banks to the credit risks and changes in the development of prices of financial instruments. The most significant impact on performance of the enterprise has just financial risk. The unsystematic risks have a higher impact on performance of the enterprise as systematic risks (Nguyen, 2020).

The determination of each individual loan, or borrower, risk assessment techniques plays a primary role in the management and minimization of the credit risk. It is only after determining the risk represented by each individual borrower and by each individual credit service that one can begin to manage the loan portfolio as a whole. The credit risk assessment of the borrower consists in the study and evaluation of the qualitative and quantitative indicators of the economic situation of the borrower. The assessment of the risk factors attending the granting of a particular loan and their comprehensive and systematic analysis enable the bank to take these factors into account in credit risk management and to prevent their recurrent and adverse impact on the results of the bank's future activities.

With the growth rate of banking industry from the 1984 A.D., the risk on banking has also made a mark simultaneously. Virtually all banks have suffered from the credit risk, which is associated with the non-payment of loan by the borrowers. Nepal Bank Limited and Rastriya Banijya Bank are the greatest victims of such risk, leading these banks to have negative net worth. That is why; this study is mainly focused on the credit risk faced by the commercial banks (Sharma, 2011).

The relationship between credit risk and commercial banks financial performance has been the concern of emerging studies both in developed and developing countries. The relationship between credit risk and commercial banks performance has been the concern of various studies that prove that credit risk is among the major factors affecting profitability performance of commercial banks, so the reality of Nepalese commercial banks should be considered on this issue. Credit risk management is an

important predictor of bank financial performance. Thus success of bank performance depends on effectiveness of credit risk management. Default risk is one kind of investment risk of non-payment of loan at the fixed future date. In Nepalese context, when interest rate is increased it causes the decreases in economic activities as well as capacity of borrower. Sometimes debtor knowingly does not pay back the loan, and invest the loan in unproductive sector. Such kind of activities occurs continuously, if there is lack of sound credit policy improper credit analysis, lack of information about loan holders and lack of regular supervision. So banks should formulate and implement sound credit policy. Loan approval and disbursement process should be conducted in better way proper credit analysis and regular supervision can control the credit risk (Chatterjee, 2005).

Commercial banks collect deposits from individuals and invest them in part as loan and advance to the borrowers and receive interest as the output of the business. Commercial banks' profit and operating cost are borne by these interest collected from the borrowers. When these interests as well as the principal are not collected in due time, the existence of the bank and the deposits of individuals will be in threat. So, necessary arrangements must be made and implemented by the banks and government to avert this situation. In addition to the credit risk, the bank also faces other risks. According to the Nepal Rastra Bank Unified Directives 2019, the major sources of risk are credit risk, liquidity risk, foreign exchange risk, and interest rate risk and operation risk etc (NRB, 2021).

1.1.1 A Brief Profile of Sample Banks Under Study

Kumari Bank Limited

Kumari Bank Limited, came into existence as the fifteenth commercial bank of Nepal by starting its banking operations from Chaitra 21, 2057 B.S (April 03, 2001) with an objective of providing competitive and modern banking services in the Nepalese financial market. 4The Bank has paid up capital of NPR 26.23 billion. Kumari Bank Limited has been providing wide-range of modern banking services through 414 points of representation located in various urban, semi urban part and rural parts of the country, with 304 branches, 48 extension counters and 62 Branchless Banking Units. The Bank has pioneered in providing modern banking services like Internet

Banking and Mobile Banking services. With the implementation of Core Banking Software, FINACL4E (version 10), the Bank is confident that it will be able to provide a robust, ultra-modern banking platform for all customers throughout the country. The Bank has been offering both Domestic and International Visa Debit Card and Credit Card, accessible in all VISA linked ATMs in Nepal and India, providing additional services to the customers through its 295 ATMs throughout the country and several POS terminals. Along with this, the Bank has also been offering latest Mobile Banking, Internet Banking, Viber Banking and QR Payments. The Bank has been able to get recognition as an innovative and fast-growing institution striving to enhance customer value and satisfaction backed by transparent business practices, professional management, corporate governance, and Total Quality Management as the organizational mission. The Bank acquired Kasthamandap Development Bank Ltd., Paschimanchal Finance Co. Ltd., Mahakali Bikash Bank Ltd. and Kankrebihar Bikash Bank Ltd. on Asadh 2074; with an objective to fulfill the directive forwarded by Nepal Rastra Bank to attain the paid-up capital of NPR 12.52 billion. Further to that, the Bank acquired Deva Bikas Bank Limited and joint operation was started from Asadh 28, 2077. On January 01, 2023, Nepal Credit and Commerce Bank Limited has been merged with Kumari Bank Limited to jointly operate in the name of Kumari Bank Limited. Post merger, the Bank's branch-network has now reached 304 branches, 295 ATMs, Bank's loan investment to NPR 280 billion and deposit-base to NPR 302 billion. The key focus of the Bank is always centered on serving unfulfilled needs of all customers by offering swift and modern technology-driven banking products and services, thereby leaving the impression as a financial institution truly committed to enhancing customer satisfaction, convenience and value(www.kumaribank.com).

Machhapuchchhre Bank Limited

Machhapuchchhre Bank Limited was registered in 1998 as the first regional commercial bank from the western region of Nepal and started its banking operations from Pokhara since year 2000. The Bank facilitates it’s customers’ need by delivering the best of services in combination with the latest state of the art technologies and prudent international practices. The Bank is the pioneer in introducing the latest technologies in the banking industry in the country. It is the first bank to introduce

centralized banking software, Globus Banking System of Temenos NV, Switzerland. The bank provides modern banking facilities such as Any Branch Banking, Internet Banking, Mobile Banking, Safe Deposit Locker facilities, Utility Bill payment (Telephone & Mobile), ATM (VISA Debit Cards) to its valued customers. Besides these, the Bank is providing 365 Days Banking and Evening Counter services to the customers through many of its offices

The Bank has been promoted by highly renowned Non-Residential Nepalese, prominent businessman and industrialists with a vision and dedication to provide the best financial products and services in the most efficient and professional manner. Now with a paid up capital of over 8.46 billion rupees, 160 Branch Offices, 160 Branchless Banking Units, 5 Extension Counters and 199 ATMs spread all across the country, it is one of the full fledged national level commercial banks operating in Nepal. It takes pride in having its own buildings for its Head and Corporate Office in Lazimpat, and Branch offices in Naya Bazar, Pokhara, Jomsom, Baglung and Damauli. Machhapuchchhre Bank Limited is committed to become one of the most preferred bank in Nepal. In today's financial market when most of the products and services offered by financial institution are same, the only difference you create is "how you deliver". MBL does not only focus for what product we offer but also how we deliver them utilizing different means of Customer Service Excellence (www.machhapuchhrebank.com).

NIC ASIA Bank Limited

NIC ASIA Bank has its antecedents in NIC Bank, which was established on July 21, 1998. The Bank was rechristened as NIC ASIA Bank after the merger of NIC Bank with Bank of Asia Nepal on June 30, 2013. This was a historic merger in the annals of the Nepalese financial landscape as the first-of-its-kind between two successful commercial banks in the country. Today, NIC ASIA has established itself as one of the most successful commercial banks in Nepal. During the post-merger integration phase, NIC ASIA was able to manage the transition very smoothly, receiving accolades from the regulators, as well as the stakeholders, paving the way for other mergers and consolidation in the Nepalese financial sector.

NIC ASIA Bank is now one of the largest private sector commercial banks in the country in terms of capital base, balance-sheet size, number of branches, ATM network, and customer base. NIC ASIA Bank Ltd is one of the largest banks of Nepal with 3,472 employees, 292 branches, 47 extension counters, 41 branchless banking, and 302 ATMs across Nepal, with a network covering all major financial centers of the country. The Bank strongly believes in meritocracy, transparency, professionalism, team spirit, and service excellence. These core values are internalized by all functions within the Bank and are reflected in all actions the Bank takes during the course of its business. NIC ASIA Bank has obtained ISO 9001:2008 certifications. NIC ASIA was recognized as "Bank of the Year 2013-Nepal" by The Banker, Financial Times, UK. This is the second time that the Bank was recognized with this prestigious award, the previous occasion being in 2007 (www.nicasiabank.com).

1.2 Problem Statement

The relationship between credit risk and commercial banks performance has been the concern of emerging studies both in developed and developing countries. The relationship between credit risk and commercial banks performance has been the concern of various studies that prove that credit risk is among the major factors affecting profitability performance of commercial banks, so the reality of Nepalese commercial banks should be considered on this issue. Weaknesses in the Nepalese banking system became apparent in the late 1990s and were manifest in the relatively controlled and fragmented financial system. Differences in regulations governing banking and non-banking financial intermediaries, lack of autonomy and weak supervisory capacities to carry out the central bank's surveillance role and enforce banking regulations, inappropriate government policies which controlled to an accumulation of non-performing loans, and non- compliance by financial institutions to regulatory requirements of the Banking Act among others posed a challenges to the Nepalese banking system (Poudel, 2012).

The commercial banks are not interested in granting loan to the priority sector. Commercial banks have concerned their operation only in urban areas. The number of commercial banks and other financial institutions are decreasing in recent time. None

of commercial banks, in long run can survive without implementing effective lending policy and practices. Commercial banks in Nepal have been facing various challenges and problem. Some of them arising due to the economic condition of the country, some of them arising due to confused policy of government and many of them arising due default of borrowers. Due to high provision and economic situation of the country, banks are not able to get high profit. Lending in industries and productive sector is very risky project. Banks are investing in house loan, hire purchasing loan, education loan for safety purpose. Lack of good lending opportunities banks are facing problem of over liquidity. Increasing in deposits in fixed and saving accounts and decreasing trend in lending is one of the serious problems in commercial banks.

Credit risk is the main problem of the banking sector in Nepal. Poor lending practices, which are indicated by poor financial analysis of borrowers, inadequate or substandard collateral and improper portfolio analysis, poor tracking of credit and intention of borrowers to default have resulted in the high amount of non-performing Loan (Bhattarai, 2018).

In recent days, loan exposure in real estate and housing sector has been drastically increased. This has resulted in the high credit concentration risk. The recovery of loan is also the major challenge for Nepalese Commercial banks. The willful defaulter, that is, the client who defaults the loan intentionally, is also one of the big problems of Nepalese commercial banks. Besides, the proper asset liabilities management of Nepalese commercial banks is also the striking problem. In assets Side, the proportion of loan is almost 60%, which means that there is less diversification in investment of Nepalese commercial banks. Because of the improper asset liabilities management of commercial banks, Nepalese commercial banks have been suffering from interest rate risk and liquidity risk (NRB, 2022).

In addition, the change in market interest rate is also one of the biggest challenges to the Nepalese banks. With the increase in number of bank and financial institutions, there is an increase in rate of interest on deposit. Financial institutions have started offering higher interest rate to collect their fund. Because of this, rate of interest on lending too goes up. Weighted average Inter-bank interest rate during the FY 2018/19 remained at 4.62%. Interest rate on saving has increased 5.09%. Interest rate on fixed

deposit has increased by 9.78%. The inflation rate of the country was 6.2% in the same period (NRB, 2022).

NRB issued directives to commercial banks to increase their paid up capital up to 8 billion after 2017 A.D. It became the most challenging task for commercial banks; risk associated with credit is clearly point out the following issues which is faced by commercial joint venture banks or other commercial banks. In order to analyze the credit risk management of commercial bank the following research problems are formulated.

i. What are the practices of credit risk management in Nepalese commercial bank?
ii. Is there any relationship between credit risk management and profitability of commercial banks in Nepal?
iii. What is the impact of credit risk management on profitability of Nepalese commercial banks?

1.3 Objective of the Study

The general objective of the study is to examine and analyze how the selected commercial banks have managed mainly credit risk in this competitive Nepalese banking industry. The specific objectives of this study are:

i. To assess the indicators of credit risk management and profitability of Nepalese commercial banks.
ii. To examine the relationship between credit risk management and profitability of commercial banks in Nepal.
iii. To analyze the impact of credit risk management on profitability of Nepalese commercial banks.

1.4 Rationale of the Study

The success of any organization is largely dependent on how properly the organization can manage the risk. Banking sector involves several risks, which need to be handled promptly for the survival and growth. As this research is made mainly to analyze the credit risks and their management in reference to NRB directives and measures, it will provide valuable insight to different stakeholders about the major

problems of banks and bank's action for its management. The key stakeholders who will be largely facilitated by this research includes,

- Commercial banks under study would highly benefited by this research. This research identifies their current credit risk management styles, NRB guidelines on credit risk management and organization of basic compliance of such guidelines etc. Further, the banks would know not only the current performance but also the idea about their strength and weaknesses.
- Individuals, who have keen interest in Nepalese economy and banking sector and would benefited. This research provides an insight into the organizational credit risk management patterns within the standards set by NRB.
- Policymakers would also be benefited as this paper identifies the problems in credit risk management and identifies the need for formulation of new policies or amendment of old policies.
- Investors, management, employers, policy maker, government, researcher, depositors and borrowers also know about the credit risks with these banks to carry out business.

1.5 Limitations of the Study

Some of the basic limitations of the study are as follows.

- Out of 20 commercial banks only three banks namely KBL, MBL and NIC Asia are taken as sample for study.
- The study is based only on secondary data taken from annual financial report of sample banks.
- The evaluation is made through the analysis of financial statement published and presented by the banks. Therefore generalization of the whole banking industry cannot be made.
- The secondary data of only ten years has been taken from the establishment of the bank i.e. from 2013/14 to 2022/23. Inaccessibility of sufficient information also limits the conclusion drawn from study.
- Only limited financial and statistical tools are used for the study.

CHAPTER II

REVIEW OF LITERATURE

The researcher has reviewed various related studies and NRB directives for the study. Firstly, the review on the concept of risk and credit risk management is briefly discussed as below:

2.1 Theoretical Review

2.1.1 Meaning of Risk

Risk refers to uncertainty on the investment faced by the investors. It is the possibility that actual outcomes may be different from those expected. Risk can be defined as the possibility of deviation of the actual return from the expected return. Kupper (2000) defines risk as the volatility of corporation's market value. Risk management, on the other hand, is the process of measuring or assessing risk and then developing strategies to manage the risk. In general, the strategies employed include transferring the risk to another party, avoiding the risk, reducing the negative affect of the risk, and accepting some or all of the consequences of a particular risk (Kupper, 2000).

2.1.2 Types of Risk Faced by Commercial Banks

Risk and uncertainties are the integral part of banking business. In banking sector, risk refers to the possibility that the bank will turn into liquidation. There are several inherent risk in banking which can be classified into three broad categories i.e. Credit Risk, Market Risk and Operational Risk.

Primarily, risk in the banking context is credit risk through lending, which occupies about 60% of total risk portfolio. Therefore, this study is mainly focused on the credit risk. However, the brief introduction of Market Risk and Operational Risk have also been included. The major sources of risk in banking business are briefly discussed as below (Poudel, 2012):

i. Credit Risk

Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. Anthony Saunders defines the credit risk as "the risk that the promised cash flows from loans and securities held by FIs (Financial Institutions) may not be paid in full". Credit risk involves iKBLity or unwillingness of a customer or counterparty to meet commitments in relation to lending, trading, hedging, settlement and other financial transactions. Santomero (1997) views credit risk is generally made up of transaction risk or default risk and portfolio risk. The portfolio risk in turn comprises intrinsic and concentration risk. The portfolio risk depends on both external and internal factors. The external factors are the state of the economy, wide swings in commodity/equity prices, foreign exchange rates and interest rates, trade restrictions, economic sanctions, Government policies, etc. The internal factors are deficiencies in loan policies/administration, absence of prudential credit concentration limits, inadequately defined lending limits for Loan Officers/Credit Committees, deficiencies in appraisal of borrowers' financial position, excessive dependence on collaterals and inadequate risk pricing, absence of loan review mechanism and post sanction surveillance, etc (Santomero, 1997).

Another variant of credit risk is counterparty risk. Counterparty risk comes from non-performance of a trading partner. The non-performance may arise from counterparty's refusal to perform due to an adverse price movement caused by systematic factors, or from some other political or legal constraint that was not anticipated by the principals. Diversification is the major tool for controlling non-systematic counterparty risk (Yusuf, 2003).

Counterparty risk is like credit risk, but it is generally viewed as a more transient financial risk associated with trading than standard creditor default risk. In addition, counterparty's failure to settle a trade can arise from other factors beyond a credit problem (Roger, 2003).

So, the goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in

individual credits or transactions. Bank should also consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization (Santomero, 1997).

ii. Market Risk

Market risk is the risk incurred in the trading of assets and liabilities due to changes in interest rates, exchange rates, and other asset prices. So, Market risk is exposure to the uncertain market value of the firm's asset. Major factors affecting Market risk are:

a. Liquidity Risk:

Anthony Saunders says "Liquidity risk arises whenever financial institutions' liability holders, such as depositors or insurance policyholders, demand immediate cash for their financial claims". When liability holders demand cash immediately – that is, put their financial claims back to the FI – the FI must either borrow additional funds or sell off assets to meet the demand for the withdrawal of funds. An institution is said to have liquidity if it can easily meet its liability holders' demand for cash either because it has cash on hand or can otherwise raise or borrow cash (Chatterjee, 2005).

In banking sector, Liquidity risk is created when banks hold different sizes of assets and liabilities and mismatch occurs in maturity of the assets and liabilities. Extreme illiquid asset in bank may result in bankruptcy whereas excess liquid asset may carry interest rate risk over the period of time. As it is fatal risk, prudent liquidity management is the primary function of banking sector. Liquidity management is also to make sure that expected shortfall amounts are funded at a reasonable cost, ensure excess fund are invested properly with reasonable returns and without carrying any interest rate risk to the bank (Achou, & Tenguh, 2008).

b. Interest Rate Risk (IRR)

Interest rate risk is the risk incurred by a financial institution when the maturities of its assets and liabilities are mismatched. Interest Rate Risk is the probability of decline in earnings, due to the adverse movements of the interest rates in various

markets. The applicable interest earned on assets and liabilities and hence net interest margin is the function of market variables and it may get changed overnight or over a period of time according to the market situation. Changes in the interest rate can significantly alter net interest income depending on the mismatch of assets and liabilities held by the bank. Changes in interest rates also affect the market value of bank's equity (Roger, 2003).

c. Foreign Exchange Risk

Foreign exchange risk is the risk that exchange rate changes can affect the value of a bank's assets and liabilities denominated in foreign currencies. The bank is also exposed to foreign exchange risk, which arises from the maturity mismatching of foreign currency positions. In the foreign exchange business, banks also face the risk of default of the counterparties or settlement risk. While such type of risk crystallization will not cause principal loss, banks may have to undertake fresh transactions in the cash/spot market to replace the failed transactions. Thus, the bank may incur replacement cost, which depends upon the currency rate movements (Chatterjee, 2005).

iii. Operational risk

Operational risk is associated with the problems of accurately processing, settling, and taking or making delivery on trades in exchange for cash. It also arises in record keeping, processing system failures and compliance with various regulations. The Basel Committee on Banking Supervision, Basel September (2000), defines operational risk as "the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events (Chatterjee, 2005).

Operational risk arises from inadequate control systems, operational problems and breaches in internal controls, fraud and unforeseen catastrophes leading to unexpected losses for a bank. Many of the operational-risk-related functions such as regulatory compliance, finance management, frauds, IT, legal, and insurance are carried out by the staff and thus human resources itself becomes a cause for operational risk (Yusuf, 2003).

2.1.3 Review of NRB Directives Related to Credit Risk

The main focus of this study is to analyze the directives of Nepal Rastra Bank related to Credit Risk Management of Commercial Banks. The directives issued from time to time are one of the tools used by the central bank to control and monitor the commercial banks. In the present context, the directives are issued by NRB quite regularly. In 2023, NRB, by using the rights given by the Nepal Rastra Bank Act 2058, has issued unified directives to regulate all three categories of financial sectors in Nepal to ensure that the banking industry functions as per the international standard and also to have more effective control mechanism for overall financial sector. In this new unified directive, loan classification and provisioning of loans of financial institutions are mentioned on Directive with the objective to minimize the possible risks associated with credits extended by financial institutions in the form of overdraft, loans and advances, bills purchased and discounted. Therefore, as per this new unified directive No. 2, banks should classify the loans and advances on the basis of aging of principal amount into the following 4 categories (NRB, 2021).

2.1.3.1. Directive No.2-Classification of Loans and Advances and Loan Loss Provision (2019).

2.2.1.1. Classification of Loans and Advances:

a. **Pass Loan;**

Loan and advances which principal amount payment are not due yet or if the due has not exceeded the due date for a period of 3 months are included under this category. Such loans and advances are defined as Performing Loan.

b. **Substandard Loan**

All the loans and advances, which due principal amounts have exceeded the due date for a period of 3 months to 6 months are included in this category.

c. Doubtful Loan

All the loans and advances, which principal amounts are due for a period of 6 months to 1 year, are included under this category.

d. Bad Loan

All the loans and advances which principal amount has crossed the due date for a period of more than 1 year as well as the advances which have least possibility of recovery or considered unrecoverable and those having thin possibility of even partial recovery in future shall be included in this category (NRB, 2019).

i) Pass Loans and advances are defined as Performing Loans.
ii) Loans and Advances falling under the category of Sub-standard, Doubtful, and Bad Loan are classifieds and defined as Non- Performing Loan.

2.1.3.1.2. Loan Loss Provisioning

1. The loan loss provisioning on the basis of the outstanding loans and advances and bills purchases are classified as per the new unified directives 2075, shall be provided as follows (NRB, 2019):

Classification of Loan	Loan Loss Provision
Good	1 Percent
Watch list	5 Percent
Substandard	25 Percent
Doubtful	50 Percent
Bad	100 Percent

Loan loss provision set aside for performing loan is defined as “General Loan Loss Provision” and Loan Loss provision set aside for Non-Performing Loan is defined as “Specific Loan Loss Provision”.

Where the banks provide for loan loss provisioning in excess of the proportion as required under directives of NRB, the whole amount of such additional provisioning may be included in General Loan loss Provision under the supplementary Capital.

2.1.3.2. Directive No 3 (Single obligor limit)

Single obligor limit refers to the limit of credit facility to a single person, a firm, a company or a group of borrowers. That means, there is certain limit beyond which a

bank cannot provide credit facilities to a borrower or the borrowers who comes under the same group. NRB has provisioned single obligor limit while providing credit facilities by the bank. According to unified directive No 3, the single obligor limit for the fund-based loan is 25 % of core capital whereas for non-fund based loan is 50 % of core capital (NRB, 2019).

The main reason of this provision is to protect bank from suffering losses due to investing in single client. In another word, this directive is intended to diversify the concentration risk (NRB, 2019).

Loan Loss Provision for minimizing concentration risk

According to NRB Directives, if any firm, person or group of borrowers is provided the credit more than the limit of single obligor, the bank should have to make 100 % provision for the loan exceeding the limit (NRB, 2019).

Sector wise lending

NRB has issued a directive for the commercial banks to send sector wise lending report on a monthly basis. The main objective of this report is to identify the different sectors in which the bank has extended its credit (NRB, 2019).

Security wise Lending

NRB has issued a directive for the commercial banks to send security wise lending report on a monthly basis. The main objective of this report is to identify the different securities on the basis of which the bank has extended its credit (NRB, 2019).

Loan Concentration on Single Sector

According to NRB directive No. 3, if the commercial bank has extended the credit facilities more than 100 % of core capital in single sector, such loan should have to be approved by the board of directors (NRB, 2019).

2.1.3.3. Directive No. 1-Capital Adequacy Ratio

Capital Adequacy Ratio (CAR) is the proportion of Capital Fund or Shareholders equity on the total risk weighted asset of a bank. In other words, it is the capital portion, which is used to finance the asset. The total risk weighted asset, on the other hand, includes both on & off balance sheet items, which has been rated with certain percentage of risk. The risk weight of asset ranges from zero for cash, balance at NRB and investment in government bonds to 100 % for loans and advances. The higher the risk weighted asset means lower will be the capital adequacy ratio as CAR is the ratio between Capital fund and Risk Weighted Asset.

According to unified directive 2075, the capital fund includes two types of capital,

A. Primary Capital

Primary capital refers to core capital of a bank, which includes the share capital employed by the shareholders and all the reserve maintained by a bank. Primary capital includes:

Primary Capital

1) Paid Up Capital
2) Share Premium
3) Non-Redeemable Preference Share
4) General Reserve Fund
5) Retained Earnings
6) Capital Redemption Reserve
7) Net Profit after Provision, Tax & Bonus (Current Year)
8) Capital Adjustment Fund
9) Other Free Reserve
10) General Reserve Fund

B. Supplementary Capital

Supplementary Capital refers to all the reserves bank has made for specific purpose, such as loan loss, foreign exchange loss etc. The supplementary capital includes:

Supplementary Capital
1) General Loan Loss Provision (Good Loans)
2) Asset Revaluation Reserve
3) Hybrid Capital Instrument
4) Unsecured Subordinated Term Debt
5) Exchange Equalization Reserve
6) Additional Loan Loss provision
7) Investment Adjustment Reserve

C. Capital Fund

Capital Fund includes both the primary and supplementary capital. It can be stated in equation as below:

Capital Fund = Primary Capital + Supplementary Capital

Risk Weighted Asset, on the other hand, refers to the all the on and off balance sheet assets, which has provided certain percent of risk weight that ranges from zero for cash, balance with NRB, investment in government securities to 100 percentage for loans and advances, fixed asset etc.

Risk Weighted Asset includes both the on and off balance sheet assets. On balance sheet asset includes three types of risk-weighted asset (i.e. 0 %, 20% and 100%). Zero percentage risk weighted assets include cash and bank balance, gold (tradable), investment in NRB and Government Bonds, loan against own bank's fixed deposit receipts and government bonds, Interest receivable on National Saving Bonds. 20 % risk weighted asset includes balance with local and foreign banks, loan against other bank's fixed deposit receipts, money at call, loan against internationally rated bank's guarantee and other investment on internationally rated banks. 100% risk weighted asset includes investment on shares and debentures, loans and advances, fixed assets, other investment, all other assets (excluding tax paid and accrued interest receivable.)

Off balance sheet assets includes four types of risk-weighted asset (i.e. 0%, 20%, 50% and 100%). Bills collection has 0 % risk. Letter of credit with maturity period less than 6 months and guarantee against counter guarantee of international rated foreign

banks have 20 % risk. 50 % risk weighted asset includes letter of credit with maturity period more than 6 months, bid bond, underwriting and performance bond. 100 % risk weighted items include advance payment guarantee, financial guarantee, other guarantee, irrevocable loan commitment, contingent liability on income tax and acceptance and other contingent liability (NRB, 2019).

The Capital Adequacy ratio of a bank is calculated as below:

a. Capital Adequacy Ratio for Core Capital

$$\text{Capital Adequacy Ratio} = \frac{\text{Core Capital}}{\text{Total Risk Weighted Asset}}$$

b. Capital Adequacy Ratio (CAR) for Total Capital Fund

$$\text{Capital Adequacy Ratio} = \frac{\text{Capital Fund}}{\text{Total Risk Weighted Asset}}$$

2.2 Empirical Review

2.2.1 Review of International Article

Sah and Pokharel (2023) analyzed the financial performance of Nepalese commercial banks using CAMEL approach. Bank and financial institutions require a method for assessing performance, considering some crucial financial statistics, and identifying strengths and weaknesses. The "CAMEL" model is an effective tool for assessing the performance of bank and financial institution. This model studied Capital adequacy, Asset quality, Management quality, Earnings capacity, and Liquidity condition of sample banks. The study has made a modest attempt to use the CAMEL technique to examine the performance of three commercial banks in Nepal from 2011/12 to 2020/21. Rastriya Banijya Bank, a wholly government-owned, Nepal SBI Bank Limited (NSBIL) joint venture, and Prime Commercial Bank Limited (PCBL), privately owned, were considered as a sample banks for the analysis. The result explained that PCBL and NSBIL could keep their risk-weighted assets at more excellent Tier I and II capital levels, demonstrating their financial soundness. This also revealed that NSBIL could support a higher percentage of well-performing loans. RBBL, NSBIL, and PCBL, all BFIs maintained average returns on shareholder equity and returns on assets. It also found PCBL was first in terms of the ratio of liquid

assets to total deposits, followed by NSBIL banks and RBBL. In light of this, this research will be tremendously instructive to academics, researchers, and bank management. They can utilize it to create a financial plan for the effectiveness of the bank performance as a whole.

IJCRT (2022) conducted study on CAMEL model analysis of public banks in India. The study stated reliable indicator and metric for determining whether an economy's economic operations are sound is performance review of the banking sector. This study is solely based on secondary data that was gathered from the Reserve Bank of India. The performance and financial soundness of a few Indian public banks have been assessed in the current study for the years 2018 through 2022. The financial health of the chosen banks has been examined using the CAMEL technique. To arrive at the result through the comparison and significant examination of several CAMEL factors, Composite Rankings, mean (μ), median (Med.) and standard deviation (σ) have been utilised. According to the CAMEL analysis, State Bank of India is placed first, followed by Union Bank of India, while Bank of Baroda took the third spot. Punjab National Bank is in the fourth spot, and the last spot was acquired by Bank of India. The State Bank of India is ranked first among the other banks included in the study when all of CAMEL's criteria are taken into account, according to the model. While State Bank of India lags behind in terms of capital adequacy and liquidity, it performs well in terms of asset quality, management effectiveness, and earning capacity.

Kwadwo (2020) studied on credit risk management and profitability in select savings and loans companies in Ghana. The objective of the study are: to study and analyse the effect of credit risk management indicators on profitability of S&L Companies and to find out the impact of Non-performing Loans on the operational activities of the S&L Companies. The study used both primary and secondary data. In order to ensure bias minimisation and fair representation of the population, the researcher employed the probability-sampling technique. The sampling of the Savings and Loans Companies for this study was through the systematic random sampling method. The selection of respondents on the other hand was through the stratified random sampling technique. The researcher used a descriptive survey for the study. The research utilised the quantitative method of data analysis. The SPSS analytical software was

used for the analysis of both the primary, and the secondary data. The samples 254 out of the 695 staff of the seven selected S&L Companies were taken.

The findings indicated that NPLR had negative and statistically significant relationship with both ROA and ROE (profitability). This indicates the severity of the impact of deterioration in asset quality (NPL) on the profitability of S&L companies in Ghana. The negative relationship of NPL ratio with both ROA and ROE was an expected outcome since non performing assets has accompanying cost such as recovery cost, and cost of provision for bad debts, which erodes the profit of the lending institutions. In addition, it was found that a negative and insignificant relationship existed between Loans and Advances to Deposit ratio (LTDR) and ROE but had a positive and insignificant relationship with ROA. The LTDR is a measure of how much depositors money is used to finance credit activities so the higher the ratio the more depositors fund is used and additional revenues generated outside the current assets of the company hence, the positive relationship between LTDR and ROA. Bank size (LNTA) had a negative and insignificant relationship with ROA but related positive and insignificant with ROE.

Nguyen (2020) studied article on credit risk control for loan products in commercial banks: Bank for Investment and Development of Vietnam. The objectives of the study are: to measure customers' credit quality and to identify types of borrower and types of borrowing so that banks can apply appropriate lending policies . The study used secondary data from desktop research and primary data from interviews, qualitative research. The secondary information included the credit policies, lending process, methods or system that the case bank is using in credit risk management. Data had analyzed straightly from the case bank's internal documents that related to credit risk management. In addition, the study used findings which are from the case bank's annual reports and local government regulations. The primary data, which is from the interviews with the case bank's employees and supervisor would also be conducted. The outcome of this research is expected to have opinions from respondents who work for the case bank, banking supervisors who evaluate the case bank's performance and the author's opinions. The SPSS analytical software was used for the analysis of both the primary, and the secondary data.

The findings indicated that in the world of banking, competition between commercial banks is increasing more and more. Lenders are trying to satisfy customers in various credit services, which include lending services. To keep themselves in the play, banks focus on improving credit growth However, higher credit growth will not truly bring higher profits if banks fail to manage credit risk. This thesis studies credit risk control for business loan products and aims to identify different approaches to control the risk effectively. The thesis includes theories that relate to credit risk management. For the empirical part, a mixed research method of qualitative and desktop research is used to study the credit risk issue of a case bank, Bank for Investment and Development of Vietnam (BIDV). Qualitative researches are carried out by interviews via email with the target bank's officers and its supervisors. In addition to primary data from the interviews, the research includes secondary data from reliable sources such as the case bank's annual reports, local government regulations, and international banking standards. With regard to BIDV, firstly, its assets classification process follows old local credit regulations which need to be amended. Secondly, the credit organization is facing difficulties in checking credit profile due to the lack of a transparent information system. Thirdly, loan covenants are used to supervise and monitor borrowers, however, they have not been utilized. Out of these is sues, the State Bank of Vietnam is recommended to revise and adjust the assets classification regulation and consider to grant more rights to the state-owned bad bank, Vietnamese Assets Management Company, to support credit risk management in the commercial banking sector. In terms of BIDV, investments in building transparent information technology system are fundamental. Besides that, the lender should offer more training program.

Shahzad (2019) studied article on the influence of credit risk management strategies on the Performance of Commercial Banks: A Comparative Case Study of UAE and UK Commercial Banks. Thee objectives of the study are to determine the most important variables that underpins the credit risk assessment models of banks in the UK and the UAE; and to determine the extent to which credit risk assessment strategies and techniques and profitability are linked in UAE and UK banks. The research prioritised an 'action research' design that used both quantitative and qualitative data within a mixed methods research design. Using non-probability convenience sampling, primary data was first collected from 100 middle-level bank managers (50 managers from the UK and 50 managers from the UAE) by means of a

self-administered questionnaire. Qualitative data was subsequently collected from 20 top managers (10 managers from Emirati banks and 10 managers from UK banks) through semi-structured interviews. From the analysis of this data, 18 key variables were identified and defined across three categories: credit risk management strategies, factors influencing risk management and commercial bank profitability.

This study undertakes a comparative investigation of the influence and adoption of credit risk management strategy on the performance of commercial banks in the United Arab Emirates (UAE) and the United Kingdom (UK). The research assesses the uses and approaches to credit risk management in the UAE in comparison to the UK, beginning with a thematic literature review that identified key theories, strategies and principles of the extant credit risk assessment literature, whilst contextualising the distinctiveness of Islamic banking. Adopting a deductive ontological and positivist epistemological position, the research prioritised an 'action research' design that used both quantitative and qualitative data within a mixed methods research design.

Ali and Dhiman (2019) studied article on the impact of credit risk management on profitability of public sector commercial banks in India for the period 2010-2017. The objective of the study is to analyze the effect of credit risk management indicators on profitability. The study used panel regression model. The study used secondary data from desktop research and primary data from interviews, qualitative research. Credit risk was measured by the capital adequacy ratio, and non-performing loans whereas profitability was measured by the ROE. The research focuses on top ten public sector commercial banks selected on the basis of total assets by using secondary data. The empirical findings indicate that ROA (profitability) is positively related to CAR, management quality and earnings ability whereas it is found to be negatively related to AQ and liquidity. Results of the research suggest that the independent variables of the sampled public sector banks significantly impact the profitability during the study period.

Pradhan and Shah (2019) studied article on credit risk management of commercial banks in Nepal. The objectives of study area: to measure credit risk level in the commercial banks, to analyze the banks' credit risk management policy and to examine different obstacles or problems resulting from credit risks. Based on a descriptive research approach the study has used survey-based primary data. The

study is quantitative and descriptive in nature, as it elaborates the association between obstacles faced in credit risk management of banks. Primary data has been used for analyzing the relationship between dependent and independent variables. The study identified the higher-level managers working in commercial banks of Nepal located in Kathmandu as its target population.

The study found that credit risk mitigation measures and credit risk management practices are positively associated with loan repayment in the banks, while obstacles have no relation with the loan repayment. Findings have justified the study objectives and the underlying hypotheses. The study also justifies that credit risk iteration as well as credit risk management practices has been well implemented in Nepali banks as discovered from the mean scores of the responses. Thus, it can be concluded that credit risk management such as complying with credit risk policy, clearly defined roles and responsibility for the responsible employees of the credit risk department. Similarly, banks should provide the employees with required skills and knowledge to help them perform regular activities and make tactful decisions to ensure profitability and performance of the bank. Commercial banks tactfully follow the credit risk mitigation measures so as to avoid the risk of having NPAs and LLPs.

Yousuf and Felfoldi (2018) studied article on the effect of credit risk management on profitability in private banks in Syria. The objectives of the study are: to examine the credit quality and identify types of borrower and types of borrowing. The study was based on secondary data. Data were analyzed by using descriptive analysis and statistical analysis. The research shows that there is a statistically significant relationship between capital adequacy and profitability. The capital adequacy ratio affects profitability negatively. Non-performing loans do not affect profitability.

Konovalova, Kristovska, and Kudinska (2017) studied article on credit risk management in commercial banks. The objectives of the study are: to determine the level of risk represented by different groups (classes) of retail clients (borrowers) and to reduce and prevent credit risk in the future as well as to improve the management of banking risks. The study used both primary and secondary data. 100 samples have been used. Descriptive and analytical research designs were used. The article proposes a model of credit risk assessment on the basis of factor analysis of retail clients / borrowers in order to ensure predictive control of the level of risk posed by

potential clients in commercial banks engaged in consumer lending. The main results of the study are the creation of a model of borrowers' internal credit ratings and the development of the methods of improving credit risk management in commercial banks. When lending to individuals (retail clients) the most significant factors affecting the value of the credit risk of a bank are the average income of the borrower, the loan amount, and the loan term. International articles reviewed are also presented in meta table.

Summary of literature review

S.N.	Author (s)	Variables	Objectives	Methodology	Findings
1.	Sah and Pokharel (2023)	Dependent variables: ROA and ROE Independent variables: Capital, assets, management, earnings and liquidity	To analyze the performance of three Nepali commercial banks using CAMEL approach	The study was based on secondary information from three selected banks. . The study has made a modest attempt to use the CAMEL technique to examine the performance of three commercial banks in Nepal from 2011/12 to 2020/21.	The study found that NSBIL could support a higher percentage of well-performing loans. RBBL, NSBIL, and PCBL, all BFIs maintained average returns on shareholder equity and returns on assets. It also found PCBL was first in terms of the ratio of liquid assets to total deposits, followed by NSBIL banks and RBBL. In light of this, this research will be tremendously instructive to academics, researchers, and bank management. They can utilize it to create a financial plan for the effectiveness of the bank performance as a whole.
2.	IJCRT (2022)	Dependent variables: ROA Independent variables: Capital, assets,	To evaluate the financial performance of a	The study is solely based on secondary data. To arrive at	The study found that the as per CAMEL analysis, State Bank of India is

		management, earnings and liquidity	few public banks in India and to look into the main elements that influence those banks' financial performance	the result through the comparison and significant examination of several CAMEL factors, composite rankings, mean, median and standard deviation have been used.	placed first, followed by Union Bank of India, while Bank of Baroda took the third spot. Punjab National Bank is in the fourth spot, and the last spot was acquired by Bank of India. The State Bank of India is ranked first among the other banks included in the study when all of CAMEL's criteria are taken into account, according to the model. While State Bank of India lags behind in terms of capital adequacy and liquidity.
3.	Kwadwo (2020)	Dependent variables: ROA and ROE Independent variables: NPL, CDR, CRR	1. To study and analyse the effect of credit risk management indicators on profitability of S&L Companies 2. To find out the impact of Non-performing Loans on the operational activities of the S&L Companies	The study used both primary and secondary data. In order to ensure bias minimisation and fair representation of the population, the researcher employed the probability-sampling technique.	The findings indicated that NPLR had negative and statistically significant relationship with both ROA and ROE (profitability). This indicates the severity of the impact of deterioration in asset quality (NPL) on the profitability of S&L companies in Ghana.
4.	Nguyen (2020)	Dependent variables: ROA and ROE Independent variables: CAR, CDR, MQR	1. To measure customers' credit quality 2. To identify types of borrower and types of borrowing so that banks can apply appropriate lending policies	The study used secondary data from desktop research and primary data from interviews, qualitative research. The secondary information included the credit policies, lending process, methods or system that the case bank is using in credit risk	The findings indicated that in the world of banking, competition between commercial banks is increasing more and more. Lenders are trying to satisfy customers in various credit services, which include lending services. To keep themselves in the play, banks focus on improving credit growth However, higher credit growth will not truly bring higher profits if

				management.	banks fail to manage credit risk.
4.	Shahzad (2019)	Dependent variables: ROA and ROE Independent variables: CAR, CDR, NPLR	1. To determine the most important variables that underpins the credit risk assessment models of banks in the UK and the UAE; 2. To determine the extent to which credit risk assessment strategies and techniques and profitability are linked in UAE and UK banks;	The research prioritised an 'action research' design that used both quantitative and qualitative data within a mixed methods research design. Using non-probability convenience sampling, primary data was first collected from 100 middle-level bank managers (50 managers from the UK and 50 managers from the UAE)	This study undertakes a comparative investigation of the influence and adoption of credit risk management strategy on the performance of commercial banks in the United Arab Emirates (UAE) and the United Kingdom (UK). The research assesses the uses and approaches to credit risk management in the UAE in comparison to the UK, beginning with a thematic literature review that identified key theories, strategies and principles of the extant credit risk assessment literature.
5.	Pradhan, and Shah (2019)	Dependent variables: ROA and ROE Independent variables: CAR, CDR, MQR.	1. To measure credit risk level in the commercial banks, 2. To analyse the banks' credit risk management policy and 3. To examine different obstacles or problems resulting from credit risks.	Based on a descriptive research approach the study has used survey-based primary data. The study is quantitative and descriptive in nature, as it elaborates the association between obstacles faced in credit risk management of banks. Primary data has been used for analysing the relationship between dependent and independent variables.	The major findings of the study is that credit risk mitigation measures and credit risk management practices are positively associated with loan repayment in the banks, while obstacles have no relation with the loan repayment. Findings have justified the study objectives and the underlying hypotheses. Thus, it can be concluded that credit risk management such as complying with credit risk policy, clearly defined roles and responsibility for the responsible employees of the credit risk department.
6.	Ali, and Dhiman (2019)	Dependent variables: ROA Independent variables: CAR, CDR, CRR	to analyze the effect of credit risk management indicators on profitability	The study used panel regression model. The study used secondary data from desktop research and primary data from interviews, qualitative research. Credit risk was measured by the capital adequacy ratio, and non-performing	The empirical findings indicated that ROA (profitability) is positively related to CAR, management quality and earnings ability whereas it is found to be negatively related to AQ and liquidity. Results of the research suggest that the independent variables of the sampled public sector banks significantly impact the

				loans whereas profitability was measured by the ROE.	profitability during the study period.
7.	Yousuf and Felfoldi (2018)	Dependent variables: ROA and ROE Independent variables: CAR, CDR, NPA	to examine the credit quality and identify types of borrower and types of borrowing.	The study was based on secondary data. Data were analyzed by using descriptive analysis and statistical analysis.	The study found that there is a statistically significant relationship between capital adequacy and profitability. The capital adequacy ratio affects profitability negatively. Non-performing loans do not affect profitability.
8.	Konovalova, Kristovska, Kudinska (2017)	Dependent variables: ROA and ROE Independent variables: CAR, CDR, CRR	a. to determine the level of risk represented by different groups (classes) of retail clients (borrowers) b. To reduce and prevent credit risk in the future as well as to improve the management of banking risks.	The study used both primary and secondary data. 100 samples have been used. Descriptive and analytical research designs were used. The study had conducted model experiments using statistical information on credit histories of clients of Latvian commercial banks engaged in consumer lending.	The article proposes a model of credit risk assessment on the basis of factor analysis of retail clients / borrowers in order to ensure predictive control of the level of risk posed by potential clients in commercial banks engaged in consumer lending. The main results of the study are the creation of a model of borrowers' internal credit ratings and the development of the methods of improving credit risk management in commercial banks.

2.2.2 Review of Previous Thesis

Thakur (2023) studied a thesis on risk management of commercial bank and financial institution. The objectives of the study are: to analyze the level risk in banking industry; and to examine the interest income and interest payment status of selected banks. The study used secondary data. Descriptive and analytical research designs were used. The study had conducted model experiments using statistical information on credit risk of commercial banks.

The study found that risk should be taken as one of the challenges of the banking industry but it is not sufficient to minimize the potential disasters. Banking risk should be managed as a separate part of the management. The study also found that out of all commercial banks operating in the country, Nepal Bank Ltd. and Rastriya Banijaya Bank are operating with nominal profit, the later turning towards negatives from time to time. Because of non-recovery of accrued interest, the margin between interest

income and interest expenses is declining. They have heavy burden of personal and administrative overhead. On the other hand, foreign JVBs are functioning in an extremely efficient way. They are making huge profit year after year. Because of their effective persuasion on long recovery, overdue and defaulting loans have been limited resulting in high margins between interest income and interest payment.

Bhattarai (2022) studied a thesis on restructuring process of commercial bank through credit risk management and responsibility of restructuring team. The objectives of the study are to analyze the credit risk in banking industry and to examine the credit policy and implementation status of selected banks. The study used secondary data. The study used quantitative data. Descriptive research design was used. The study used statistical and financial tools. The study found that increase in interest rate; decreases in economic activities cause decrease in the capacity of debtor and sometimes the debtor is knowingly do not pay back the loan. Other than these reasons in the context of Nepal lack of credit policy, lack of information about the loan holder (three c's capacity, character and capital), unhealthy competition and small market area, causes loan defaults. Default loan increases the resources mobilization cost and reduces the profit earning capacity of the bank. Therefore increases in default loans are the indicator of problematic situation to the bank.

Regmi, (2021) studied a thesis on importance of credit information bureau and its activities. The objectives of the study are: to determine impact of deposit in liquidity and its effect on lending practices, to know the volume of contribution made by both bank in lending and to examine lending efficiency and its contribution in profit. The study used secondary data. Descriptive research design was used. The study used statistical and financial tools. Two commercial banks were taken as sample out of 28 commercial banks. Purposive sampling method was used. The study found in terms of liquidity ratio, current ratio of NSBL is higher than that of NBBL. The ratio of liquid fund to current liability of NSBL is higher than NBBL. The ratio of loans and advances to total assets of NBBL is higher than NSBL. Likewise mean ratio of loans and advances to total deposit of NBBL is higher than NSBL. Among the various measurement of profitability ratio return on equity (ROE) and earning per share (EPS) reflects the relative measure of profitability. The performance of NBBL is better than NSBL. Return on equity and earning per share of NBBL are higher than that of

NSBL in all years. Co-efficient of correlation between deposit and loans & advances of sample banks have positive value. Also co-efficient of correlation between total income and loans & advances of both bank have positive relation. Coefficient of correlation between net profit and loans & advances of NSBL is negative as other variables like increase in interest suspense and loan loss provision affects net profit. Coefficient of correlation between net profit and loans & advances of NBBL is positive.

Shrestha (2020) studied a thesis on credit risk management of commercial banks in Nepal. The objectives of the study are: to analyze the significance and impact of Nepal Rastra Bank's directives on commercial banks; to examine the capital adequacy of selected banks and to examine the relation of capital funds to the other stakes of bank. The study used secondary data. Descriptive research design was used. The study used statistical and financial tools. Two commercial banks were taken as sample out of total commercial banks. Convenience sampling method was used.

The study found that capital adequacy ratio of KBL and Machhapuchhre are 13.40 percent and 12.86 percent respectively, which are more than 9 percent. Banks are following the directives but in same cases such like supplementary capital and balance at NRB there is shortfall. The excurses amount of total deposit in balance of NRB there is shortfalls. The banks have categorized the loan amount into four diffident categories as per NRB's directives. The increasing loan loss- providing amount decreased the profit of the banks. The charge in the single borrower limit has brought down the limits of the fund based and non-fund based loans which have resulted to reduced loan exposure to banks The study found that both KBL and SBI banks has not increased supplementary capital as it has shortfall in comparison with NRB guidelines and to meet the supplementary capital adequacy ratio even though it can be compensated by the excess amount of core capital. Only liquid banks can attract loan core deposit, which helps in reducing interest expenses and give loan to good customer at lower rate, which results in requirement of less provision and high net profit.

Thapa (2019) studied a thesis on study of credit risk analysis and non-performance assets of Nepalese commercial banks in Nepal. The objectives of the study are: to highlight Loans and Advances trend in commercial banks, and to point out the

amount of NPAs in Nepalese commercial banks. The study used secondary data. Descriptive research design was used. The study used five years data. The study used statistical and financial tools. Commercial banks were taken as sample for the study.

The study found that the status of non-performing loan of commercial banks shows that, they are making positive improvement over it. By the end of mid July 2009, the ratio of non-performing loans to total loan and advances declined to 9.65 percent. Total amount of non-performing loan remained to Rs. 22182.9 million in the same year. In the last year the percent and amount of non-performing loan were 14.22 percent and Rs. 26770.42 million respectively. Loans and advances, the major component of assets, constituted the 46.66 percent of total assets in mid July 2009. Similarly, investment and liquid funds, another component of assets, registered the 19.06 percent and 8.98 percent of total assets in the same year.

2.3 Research Gap

From the review of various literatures, it has been found many research work have been done on the study of NRB Directives and its compliance and analysis of credit management through loan loss provision, non-performing loans and capital adequacy; however, very few thesis have been found on the credit risk management which is the most important aspect of the banking sector. So, the researcher can make further research on capital adequacy, concentration risk, collateral risk, and the actual practices followed by the management of Nepalese commercial banks from its own side besides the NRB directives to manage and control the credit risks etc.

Earlier studies and researches on the impact of credit risk management on the profitability of development banks and finance company are carried out on the apparent approach by taking the most common indicators in consideration. Few researches which focused on the impact of credit risk management on the profitability of commercial banks have tried to analyze the impact comparing it with its own financial indicators. The study also reviews statistical tools such as correlation coefficient and regression analyses have been used in most of these studies. This study is different from other researches in terms of sample banks, variables used, data presentation as well as statistical and financial tools used for interpretation and analysis of data.

Hence the study had attempted to fill this gap by measuring the credit risk of KBL, MBL and NIC Asia by studying their credit risk management system. This study also aims to find out the organizational structure of KBL, MBL and NIC Asia for the proper implementation and compliance of NRB Directives and to manage the credit risk. Therefore, this study is being helpful to those interested parties, scholars, students, teachers and civil society, other stakeholders, business man and government for academically as well as policy perspectives.

CHAPTER III

RESEARCH METHODOLOGY

The main objective of this research is to measure the credit risk of the selected commercial banks and to study the various management techniques and principles used by the Nepalese commercial banks to manage the credit risk. Thus, this chapter consists of the research methodology applied in the study for the fulfillment of the stated objectives. Thus the overall approach to the research is presented in this chapter. This chapter consists of research design, sample size and selection process, data collection procedure and data processing and presentation techniques and tools.

3.1 Research Design

This study is the combination of descriptive and causal comparative research design. Published data are used to identify and analyze the credit risk of a bank in the past period. Similarly, management system, organizational structure and policies for mitigating the credit risk and the credit risk management procedures have been presented in descriptive form so as to identify the current status from which pitfalls can be identified. From collection of past data and information from key informants, the credit risk management system has been analyzed and recommendations have been made for improving the credit risk management of banks. Since only three banks have been selected for the study, this study is a comparative study among these three banks in credit risk and their management system.

3.2 Population and Samples

Since the research topic is about credit risk management of commercial banks, all the commercial banks of Nepal form population of the study. The population for the study comprises all the Nepalese commercial banks. Total commercial banks in Nepal till May 30, 2024 are 20 as stated by the bulletin published by NRB. To fulfil objective of the study, among the 20 commercial banks, only 3 (Kumari Bank Ltd., Machhapuchhre Bank. and NIC Asia Bank Ltd.) of commercial banks were selected using convenience sampling method for the purpose of analysis representing 14.28% of total population. The sample is chosen with an objective to find out the credit risk

management system of commercial banks, covering ten years from 2013/14 to 2022/23 period. MBL, KBL and NIC Asia are taken for the study as there exists similarities between these banks in many respects such as capital base, profit, deposit, lending and date of establishment etc. made researcher to take these three bank as samples.

3.3 Sources of Data

For this study, secondary data are used. Secondary data are collected mainly from published sources like annual reports, prospectus, newspaper, journal, Internet and other sources. Secondary data published in the annual reports of concerned organizations are collected through personal visit in respective organization as well as from their web sites. The secondary data from 2013/14 to 2022/23 has been taken.

3.4 Data Collection Techniques

All the annual report published is verified and approved through AGM of respective banks and also approved by NRB Since these annual reports were approved by concerned body the reports were considered authentic to be present in this research. For the credit risk analysis, information is collected through staffs each from KBL, MBL and NIC Asia working in Credit and Credit Administration and Control Departments.

3.5 Data Processing and Presentation

The data obtained from the different sources are in raw form. The raw data is processed and converted into required form. For this study, required data are taken from the secondary source (bank's publication) and presented in this study. For presentation, different tables are used. Computation has been done with the help of scientific calculator and computer software program.

3.5.1 Financial Tools

In this study, various ratios have been used as per requirement. The major ratios used in this study include:

i. Loans and advances to Total Risk Weighted Assets Ratio

The ratio of loans, advances and bills purchased to total risk weighted assets measures the volume of loans and advances in the structure of total risk weighted assets (i.e. the total assets after the adjustment of certain degree of risk or the risk assets). Granting Loans and advances always carry a certain degree of risk. Thus this asset of banking business is regarded as risky assets. To determine the adequacy of core capital:

$$\text{Capital Adequacy Ratio} = \frac{\text{Core Capital}}{\text{Total Risk - Weighted Assets}} x100\%$$

ii. Non-performing Loan to Total Loans and advances Ratio

This ratio determines the proportion of non-performing loans in the total loan portfolio. Higher the ratio implies the bad quality of assets of banks in the form of loans and advances

$$\text{NPL Ratio} = \frac{\text{Total Non Performing Loan (TNPL)}}{\text{Total Loan (TL)}} x100\%$$

iii. Loan Loss Provision to Non Performing Loan Ratio

This ratio determines the proportion of provision held to non-performing of bank. This ratio measures up to what extent of risk inherent in NPL is covered by total loan loss provision. The higher the ratio, the better cushion that the bank provides for recovering from loss caused by NPL. This can be presented as:

$$\text{LLP Ratio} = \frac{\text{Total Loan Loss Provision (TLLP)}}{\text{Total Non Performing Loan (TNPL)}} x100\%$$

iv. Loan Loss Provision to Total Loans and Advances

This ratio indicates the amount of Loan Loss Provision, a cushion for the possibility of default, to total loans and advances of a bank. Since high provision has to be made for non-performing loan, higher provision for loan loss reflects increasing non-performing loan in volume of total loans and advances.

$$\text{LLP Ratio} = \frac{\text{Total Loan Loss Provision (TLLP)}}{\text{Total Non Performing Loan (TNPL)}} x100\%$$

v. Core Capital to Total Risk Weighted Asset (RWA)

Core Capital to Total Risk Weighted Asset (RWA) ratio measures the proportion of funding of total Risk Weighted Asset from the core capital. Risk weighted asset refers to all the on balance sheet and off balance sheet asset which has been weighted by some portion of risk. To determine the adequacy of core capital:

$$\text{Capital Adequacy Ratio} = \frac{\text{Core Capital}}{\text{Total Risk - Weighted Assets}} x100\%$$

vi. Supplementary Capital to Total Risk Weighted Asset

This ratio measures how much supplementary Capital a bank has to finance the total RWA. Supplementary Capital refers to the reserve maintained by the bank for specific purpose such as loan loss, foreign exchange loss etc. To determine the adequacy of core capital:

$$\text{Capital Adequacy Ratio} = \frac{\text{Core Capital}}{\text{Total Risk - Weighted Assets}} x100\%$$

vii. Capital Fund to Total Risk Weighted Asset (RWA)

Capital fund to total RWA ratio measures how much RWA is financed from the Capital Fund. To determine the adequacy of core capital:

$$\text{Capital Adequacy Ratio} = \frac{\text{Core Capital}}{\text{Total Risk - Weighted Assets}} x100\%$$

3.5.2 Statistical Tools

In order to get the concrete results from the research, data are analyzed by using different types of tools. So for this study following statistical tools are used:

1. Arithmetic Mean:

Arithmetic mean has been widely used in this study. This tool has been used to calculate the single figure that can represent the whole data for the period. It is computed by using following formula:

Mean ($\overline{X}$) = $\frac{\sum X}{n}$ Where, $\overline{X}$ = Mean

$\sum$ X = Sum of all the Variable X n = Variables involved

2. Standard Deviation:

Standard Deviation is a tool to measure the risk. Here, standard deviation is used as a measure of dispersion. It has also been used as a measure to identify the risk. Higher the deviation greater the risk. It can be computed by using following formula

$$S.D(\delta) = \sqrt{\frac{1}{n}\sum\left(X - \overline{X}\right)^2}$$

3. Coefficient of Variation

The corresponding relative measure of dispersion is known as the coefficient of variation. The higher co efficient of variations of series refers more variable or less consistency or less uniformed and the series for which coefficient of variation is less, is said to be less variable or more consistent and more uniform variable, it is calculated by the following formula.

Co- efficient of variation. (C.V.) $= \frac{\sigma}{\overline{x}}$

Where, X = (mean of Series), CV = Coefficient of variation

(σ) = Standard deviation

4. Correlation Coefficient

Correlation may be defined as the degree of linear relationship existing between two or more variables. Two variables are said to be correlated is accompanied by the change of another variable. But the correlation coefficient always remains within the limit of +1 to -1. By Karl Pearson, the simple correlation coefficient (between two variables say X and Y) is given by:

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

Where, r = Correlation between X and Y, n= Number of observations in series X and Y, ∑X= Sum of observations in series X, ∑Y= Sum of observations in series Y, $\sum X^{2=}$ Sum of square observations in series X, $\sum Y^{2=}$Sum of squared observations in series Y and ∑XY= Sum of product of observations in series X and Y

5. Regression Analysis

Multiple regression analysis is a logical extension of the simple linear regression analysis. Instead of single independent variable, two or more independent variables are used to estimate the unknown values of a dependent variable. To examine the impact of credit risk management on profitability, the following multiple regression equation is analyzed. Multiple Regression Model

$\hat{Y}_{ROA} = \beta_0 + \beta_1 X_{CAR} + \beta_2 X_{LLPR} + \beta_3 X_{NPLR} + \beta_4 X_{CRR} + e$

$\hat{Y}_{ROE} = \beta_0 + \beta_1 X_{CAR} + \beta_2 X_{LLPR} + \beta_3 X_{NPLR} + \beta_4 X_{CRR} + e$

Y = profitability (ROA) and (ROE)

X_{CAR}= Capital adequacy ratio

X_{LLPR}= loan loss provision ratio

X_{NPLR}= Non-Performing loan ratio

X_{CRR}= Cash reserve ratio

e= error component

β0= the intercept (constant)

Where β1= regression coefficient of CAR , β2= regression coefficient of LLPR, β3= regression coefficient of NPLR, β4 = regression coefficient of CRR which represents the degree with which bank profitability changes as the independent variable change by one unit variable.

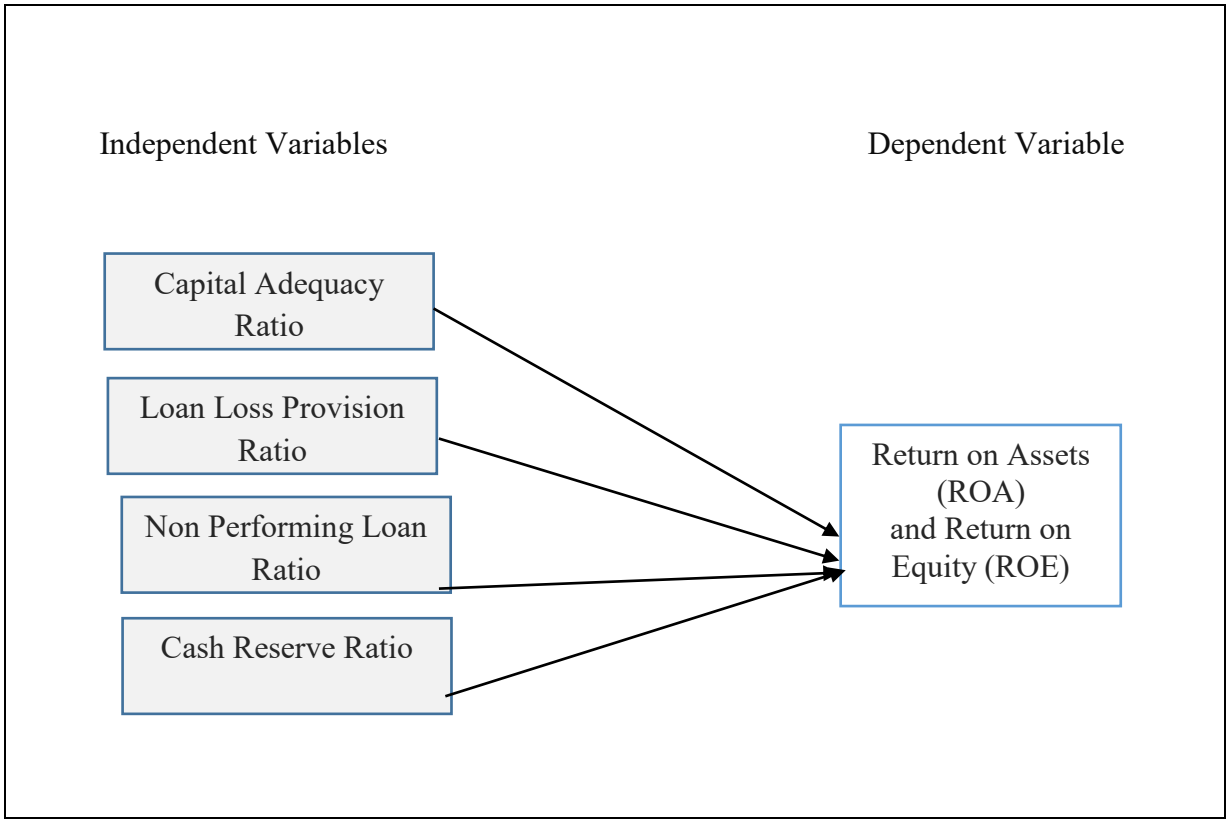
6. Coefficient of Determination

The coefficient of determination gives the percentage variation in the dependent variable that is accounted for by the independent variables. In other words, the coefficient of determination gives the ratio of expected variance to the total variance. The coefficient of determination is given by the square of the correlation coefficient, i.e. r^2 so the coefficient of determination = Square of correlation = (r^2).

3.6 Research Framework and Definition of Variables

The conceptual framework is generally developed based on a literature review of existing studies and theories about the topic. In view of theory and major empirical evidences, it is expected that the profitability (return on equity) and return on assets of commercial banks may affect by credit risk management (capital adequacy ratio, loan loss provision ratio, non-performing loan ratio and cash reserve ratio). The conceptual

framework is developed to test the impact of these credit risk management indicators on the profitability of licensed commercial banks of Nepal. In this study conceptual framework is portrayed in figure 3.1. Earning is the difference between income and expenses. Higher earning indicates higher income and lower expenses. Higher earning is always a result of better performance. In this study capital adequacy ratio, loan loss provision ratio, non-performing loan ratio and cash reserve ratio are taken as independent variables. Return on assets and return on equity are taken as dependent variable.



Sources: Nguyen, 2020

Figure 1: Conceptual Framework (Relationship between Dependent and Independent variable

Definition of Variables:

Independent Variables

1. Capital Adequacy Ratio (CAR)

Capital fund to total Risk Weighted Asset (RWA) ratio measures how much RWA is financed from the Capital Fund. Capital Fund includes Core Capital plus Supplementary Capital. The higher the ratio does a bank have, the better is the bank's financial position and the bank will be in less risky position and can increase its asset, which ultimately will increase bank's overall profit (Ali & Dhiman, 2019).

2. Loan Loss Provision Ratio (LLPR)

This ratio indicates the amount of Loan Loss Provision, a cushion for the possibility of default, to total loans and advances of a bank. Since high provision has to be made for non-performing loan, higher provision for loan loss reflects increasing non-performing loan in volume of total loans and advances (Nguyen, 2020).

3. Non-performing Loan Ratio (NPLR)

This ratio determines the proportion of non-performing loans in the total loan portfolio. As per Nepal Rastra Bank directives the loans falling under category of substandard, doubtful and bad loan are regarded as non-performing loan. Higher the ratio implies the bad quality of assets of banks in the form of loans and advances (Bhattarai, 2022).

4. Cash Reserve Ratio (CRR)

Banks maintain liquidity in various forms like ready cash at its disposal, certain percentage at central bank (NRB) as a statutory requirement, makes placements in other banks and some percentage is utilized in investment on government securities. Banks pay the depositors their money when demanded and if this is not met, it damages bank's image. The confidence of the public will be lost and this leads the bank towards its down fall. As we know that every bank has to maintain a reserve with Nepal Rastra Bank (NRB) equal to 5% of total local currency deposit. This is done so that there will be no problem relating to deficiency of liquid cash as it affects the goodwill of the banks (Bhattarai, 2022).

Dependent variables

1. Return on Assets (ROA)

Return on assets measures a company's success in earning a return for all providers of capital. Higher ROA means optimum utilization and management of the total assets. This ratio is calculated by dividing the net profit after tax by total assets (Nguyen, 2020).

2. Return on Equity

Return on equity measures a company's success in earning a return for the common stockholders. Higher ROE indicates better utilization of capital fund. The Return on Equity ROE is derived by dividing net profit after tax by total equities (Nguyen, 2020).

CHAPTER IV

RESULTS AND DISCUSSION

This is the section where, the filtered data are presented and analyzed. This is one of the major chapters of this study because it includes detail analysis and interpretation of data from which concrete result can be obtained. This chapter consists of various calculation made for the analysis of credit risks of the sample banks. To make our study effective, precise and easily understandable. The analysis is fully based on secondary data.

4.1 Descriptive Statistics

The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization. In order to manage credit risk, it has to be measured. Measurement of credit risk requires thorough assessment of credit appraisal by applying various statistical tools and techniques. The key credit performance indicators of KBL, MBL and NIC Asia have been analyzed using various financial and statistical tools. The descriptive statistics of sample commercial Banks have been presented below:

Table 1

Descriptive statistics **(in %)**

Variables	KBL		*MBL*		*NIC Asia*	
	Mean ($\bar{x}$)	Standard Deviation	Mean ($\bar{x}$)	Standard Deviation	Mean ($\bar{x}$)	Standard Deviation
LATRWAR	84.20	5.03	107.06	20.11	79.55	16.79
NPLR	1.90	1.17	1.05	1.09	1.69	1.14
LLPR	135.66	50.64	211.92	90.38	141.12	65.39
LLPTLAR	2.51	1.56	1.46	0.42	1.89	1.05
CAR	14.94	2.55	15.72	2.37	12.04	1.45

Note. *Annual Reports of Sample Bank*

Total Loans, Advances & Bills Purchased to Risk Weighted Assets (RWA) ratio measures the management attitude towards risky assets. The lower ratio is indicative of lower proportion of income generating assets, high degree of safety in liquidity and low degree of risk and vice versa.

Table 1 exhibits the loans and advances to total risk weighted assets of three commercial banks for ten consecutive years. This ratio shows the fluctuating trend of KBL, MBL and NIC Asia. RWA is increasing year by year because of the increase in total loan and advances in sample banks. The overall ratio of KBL is 84.20% where as ratio in MBL and NIC Asia are 107.06% and 79.55%. From this, it is clear that out of total risk weighted assets in balance items the proportion of loans and advances is lower in NIC Asia as compared to KBL and MBL. This means that the credit risk is higher in KBL and MBL as compared to NIC Asia. Likewise, the standard deviation of KBL, MBL and NIC Asia are 5.03, 20.11 and 16.79 respectively. C.V. of KBL is lesser than MBL and NIC Asia which shows there exist more consistency in KBL than other two banks. This indicates that the ratio deviate more from the average in case of MBL and NIC Asia than KBL. The data shows the credit risk is increasing as the total loan and advances is increasing. Looking to the trend of samples banks it can be assumed that the same trend is occurring in whole banking industry.

Non-Performing Loan to Total Loans and Advances ratio determines the proportion of non-performing loans in the total loan portfolio. As per Nepal Rastra Bank directives the loans falling under category of substandard, doubtful and bad loan are regarded as non-performing loan. Higher the ratio implies the bad quality of assets of banks in the form of loans and advances. Hence the lower NPL to total credit ratio is preferred.

Table 1 shows the ratio of non-performing loans to total loans and advances of KBL, MBL and NIC Asia for ten consecutive years. It is found that the NPL of KBL, MBL and NIC Asia is in decreasing trend though the loans and advances are in increasing trend. The average NPL ratios of KBL, MBL and NIC Asia are 1.90%, 1.05% and 1.69 % respectively. It can be inferred that the average NPL of KBL is higher than that of MBL and NIC Asia. This is due to the highest amount of NPL in fiscal year 2012/13 (i.e. 4.03%). But in more recent years the NPL of the MBL and NIC Asia has

been decreasing significantly. The standard deviation of KBL, MBL and NIC Asia are 1.17, 1.09 and 1.14. C.V. of KBL is lesser than MBL and NIC Asia which shows there exist more consistency in KBL than other two banks. Thus, it portrays that MBL ratios deviate less from the average ratio than that of KBL and NIC Asia, which refers to less risk to MBL. MBL credit risk is more and the deviation shows it is manageable compared to KBL and NIC Asia.

Loan Loss Provision to Non-Performing Loan (NPL) Ratio determines the proportion of provision held to non-performing of bank. This ratio measures up to what extent of risk inherent in NPL is covered by total loan loss provision. The higher the ratio, the better cushion that the bank provides for recovering from loss caused by NPL. Hence higher ratio signifies the better arrangement for the credit risk of a bank.

Table 1 shows the ratio of provision held to non- performing loan of KBL, MBL and NIC Asia for ten consecutive years. The average ratios of NPL of KBL, MBL and NIC Asia are 135.66%, 211.92% and 141.12% respectively. This shows that MBL has provided higher cushion of provisioning to non-performing loan compared to KBL and NIC Asia. The standard deviation of KBL, MBL and NIC Asia are 50.64, 90.38 and 65.39 respectively. C.V. of KBL is lesser than MBL and NIC Asia which shows there exist more consistency in KBL than other two banks. This means that there exists the higher deviation in the ratio from the average ratio in context of MBL than KBL and NIC Asia. The table shows MBL investment in riskier assets is higher compared to KBL and NIC Asia. The figure also shows that due to increase in credit and due to risk involved in credit the provision amount is increasing. The increase in provisions means decrease in net profit.

Loan Loss Provision to Total Loans and Advances ratio indicates the amount of Loan Loss Provision, a cushion for the possibility of default, to total loans and advances of a bank.

Since high provision has to be made for non-performing loan, higher provision for loan loss reflects increasing non-performing loan in volume of total loans and advances. The low ratio signifies the good quality of assets in the volume of loans and advances and makes efforts to cope with probable loan loss. Higher ratio implies that the bank has the higher proportion of NPL in bank loan portfolio and thus the bank is

greater exposed to the credit risk. It is found that the sample banks have least portion of loan loss provision. This means that sample banks have least amount of non-performing loan. The average LLP to total loan and advances ratio is 2.51, 1.46 and 1.89% of KBL, MBL and NIC Asia respectively. The ratio is higher in KBL and NIC Asia than MBL. This higher ratio reflects that the KBL and NIC Asia has higher non-performing loan compared to MBL.

Likewise the Standard deviation of KBL, MBL and NIC Asia are 1.56, 0.42 and 1.05 respectively. C.V. of MBL is lesser than KBL and NIC Asia which shows there exist more consistency in MBL than other two banks. From this, it is cleared that the ratio of KBL and NIC Asia have higher deviation from its average ratio and so have higher risk than that of MBL.

Capital fund to total RWA ratio measures how much RWA is financed from the Capital Fund. Capital Fund includes Core Capital plus Supplementary Capital. The higher the ratio does a bank have, the better is the bank's financial position and the bank will be in less risky position and can increase its asset, which ultimately will increase bank's overall profit.

Table 1 exhibits Total Capital fund to Risk Weighted Asset (RWA) of KBL, MBL and NIC Asia for 10 years. Sample banks have capital adequacy ratio higher than the statutory requirement in all 10 years. The average ratio of KBL, MBL and NIC Asia is 14.94%, 15.72% and 12.04 % respectively. This shows that MBL has slightly higher Capital Adequacy Ratio than KBL and NIC Asia, which signals that MBL is in a bit better position than KBL and NIC Asia. As the bank started to grow the capital will be more utilized on the asset. In case of MBL and NIC Asia, the ratio is more fluctuating. Similarly, the average excess of ratio than statutory requirement of KBL, MBL and NIC Asia is 3.94%, 4.72% and 1.04% respectively. This figure indicates that MBL has higher excess ratio than KBL and NIC Asia. The standard deviation of the ratio of Total Capital fund to RWA of KBL, MBL and NIC Asia is 2.55, 2.37 and 1.45 respectively. C.V. of NIC Asia is lesser than KBL and MBL which shows there exist more consistency in NIC Asia than other two banks, which indicates that the ratios of KBL fluctuate more from the average than that of MBL and NIC Asia.

4.2 Relationship between CAR, LLPR, NPLR and CRR to ROA and ROE

The relationship of capital adequacy ratio, non-performing loan ratio and cash reserve ratio to return on assets and return on equity is determined in this section. For the analytical purpose, the return on assets and return on equity are assumed to be influenced with the volatility occurred in CAR, LLPR, NPLR and CRR Hence, ROA and ROE are taken as dependent variable whereas CAR, LLPR, NPLR and CRR are taken as independent variable. The correlation analysis is performed to determine the relationship of CAR, LLPR, NPLR, and CRR with ROA and ROE.

4.2.1 Correlation Analysis

The correlation analysis of the overall data is done to find out the relationship between different independent variables (CAR, LLPR, NPLR and CRR) with dependent variables (ROA and ROE).

Table 2

Relationship of ROA and ROE with CAR, LLPR, NPLR and CRR of MBL

Variables	ROA	ROE	CAR	LLPR	NPLR	CRR
ROA	1	-	-	-	-	-
ROE	-0.540	1	-	-	-	-
CAR	0.944**	0.943**	1	-	-	-
LLPR	0.543	0.545	-0.500	1	-	-
NPLR	-0.564	-0.640	-0.480	0.845**	1	-
CRR	-0.941**	-0.940**	-0.798**	-0.556	-0.486	1

Significant** at 0.01 level

Table 2 shows the correlations between different variables. Table 4 shows the correlation between independent and dependent variable i.e. independent variable consist CAR, LLPR, NPLR and CRR and dependent variable consist ROA and ROE for MBL. The table 16 shows the relationship of profitability (i.e. ROA and ROE) is strongly correlated with CAR and CRR. The relationship of ROA and ROE with CAR and CRR are significant at 1% level of significance. The table shows that profitability has positive significant relationship with CAR and negative significant relationship with CRR. It also shows that profitability has positive significant relationship with LLPR and negative significant relationship with NPLR.

Table 3

Relationship of ROA and ROE with CAR, LLPR, NPLR and CRR of KBL

Variables	ROA	ROE	CAR	LLPR	NPLR	CRR
ROA	1	-	-	-	-	-
ROE	-0.550	1	-	-	-	-
CAR	0.954**	0.953**	1	-	-	-
LLPR	0.553	0.555	-0.550	1	-	-
NPLR	-0.505	-0.650	-0.485	0.855**	1	-
CRR	-0.951**	-0.950**	-0.784**	-0.507	-0.492	1

Note. Significant** at 0.01 level

Table 3 shows the correlations between different variables. Table 5 shows the correlation between independent and dependent variable i.e. independent variable consist CAR, LLPR, NPLR and CRR and dependent variable consist ROA and ROE for KBL. The table 5 shows the relationship of profitability (i.e. ROA and ROE) is strongly correlated with CAR and CRR. The relationship of ROA and ROE with CAR and CRR are significant at 1% level of significance. The table shows that profitability has positive significant relationship with CAR and negative significant relationship with CRR. It also shows that profitability has positive significant relationship with LLPR and negative significant relationship with NPLR.

Table 4

Relationship of ROA and ROE with CAR, LLPR, NPLR and CRR of NIC Asia

Variables	ROA	ROE	CAR	LLPR	NPLR	CRR
ROA	1	-	-	-	-	-
ROE	-0.580	1	-	-	-	-
CAR	0.984**	0.983**	1	-	-	-
LLPR	0.583	0.585	-0.580	1	-	-
NPLR	-0.505	-0.680	-0.480	0.885**	1	-
CRR	-0.981**	-0.980**	-0.788**	-0.587	-0.498	1

Significant** at 0.01 level

Table 4 shows the correlations between different variables. Table 4 shows the correlation between independent and dependent variable i.e. independent variable consist CAR, LLPR, NPLR and CRR and dependent variable consist ROA and ROE for NIC Asia. The table 4.18 shows the relationship of profitability (i.e. ROA and ROE) is strongly correlated with CAR and CRR. The relationship of ROA and ROE with CAR and CRR are significant at 1% level of significance. The table shows that profitability has positive significant relationship with CAR and negative significant relationship with CRR. It also shows that profitability has positive significant relationship with LLPR and negative significant relationship with NPLR.

4.2.2 Regression Analysis

To determine the effect of CAR, LLPR, NPLR and CRR on ROA and ROE, regression as well as their coefficient of determination are calculated. To determine the magnitude of the effects of the independent variable to the dependent variable, multiple regression analysis is performed.

Table 5

Multiple regression analysis of ROA on CAR, LLPR, NPLR and CRR of KBL Bank

(Regression Equation: $\hat{Y}_{ROA} = \beta_0 + \beta_1 X_{CAR} + \beta_2 X_{LLPR} + \beta_3 X_{NPLR} + \beta_4 X_{CRR} + e$)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.999	.998	.995	13.4022	.998	12.652	9	9	.002

a Predictors: (Constant), CAR, LLPR, NPLR, CRR

Source: Calculated from SPSS Computer Software

Table 6

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20.13	3.452		2.938	.019
	CAR	0.016	.682	.014	4.693	.003
	LLPR	0.0135	.350	0.0132	3.720	.0113
	NPLR	-0.012	-1.154	-.011	-3.072	.010
	CRR	-0.028	-1.263	-.023	--3.057	.016

a Dependent Variable: ROA

Note. *Calculated from SPSS Computer Software*

The regression model is $\hat{Y}_{ROA}$= 20.13 + 0.016X_{CAR}+ 0.0135X_{LLPR} -0.012X_{NPLR}- 0.028X_{CRR}. The reported results also include the values of F-statistics (F) and coefficient of determinants (R^2). The regression of dependent variable of ROA shows that beta coefficient for total CAR and LLPR are positive except NPLR and CRR as indicated in table. The result shows that banks with better CAR would have higher ROA keeping LLPR, CRR and NPLR constant. Similarly, increase in LLPR by Re.1 leads to increase in ROA by Re. 0.0135 holding the CAR, NPLR and CRR variable constant and increase in NPLR by Re.1 leads to decrease in ROA by Re. 0.012 holding the CAR, LLPR and CRR constant and increase in CRR by Re. 1 lead to decrease in ROA by Rs. 0.028 keeping CAR, LLPR and NPLR constant. The beta

coefficient is significant for total CAR, LLPR, NPLR and CRR. The constant a=20.13 indicated that if all variables used in this model is zero, ROA is Re. 20.13.

The value of multiple coefficient of determination (R^2) is 0.998 in KBL bank indicated that 99.8% of total variation in ROA of this bank is explained by independent variables and only 0.02% is explained by other variables. The significant values of CAR, LLPR, NPLR and CRR are respectively 0.003 lesser than 0.05, 0.0113 is lesser than 0.05, 0.010 lesser than 0.05 and 0.016 lesser than 0.05 which shows that there exist significant relationship between dependent variable ROA with independent variable CAR, LLPR, NPLR and CRR. Further the significant value of F is 0.002 which is lesser than 0.05 (level of significant) which shows the overall linear regression model is significant.

Table 7

Multiple regression analysis of ROA on CAR, LLPR, NPLR and CRR of NIC Asia Bank Limited

(Regression Equation: $\hat{Y}_{ROA} = \beta_0 + \beta_1 X_{CAR} + \beta_2 X_{LLPR} + \beta_3 X_{NPLR} + \beta_4 X_{CRR} + e$)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.910	.829	.657	8.1629	.829	4.838	9	9	.0171

a Predictors: (Constant), CAR, LLPR, NPLR, CRR

Table 8

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.0	17.241		2.080	.0173
	CAR	0.04	.350	0.035	3.720	.0113
	LLPR	0.0153	.301	0.0145	4.48	.0598
	NPLR	-0.029	.301	-0.028	-3.448	.0598
	CRR	-0.031	0.352	-0.0395	-3.558	0.0795

a Dependent Variable: ROA

Note. Calculated from SPSS Computer Software

The regression model is $\hat{Y}_{ROA} = 15.0 + 0.04X_{CAR} + 0.0153X_{LLPR} - 0.029X_{NPLR} - 0.031X_{CRR}$. The reported results also include the values of F-statistics (F) and coefficient of determinants (R^2). The regression of dependent variable of ROA shows that beta coefficient for CAR and LLPR are positive except NPLR and CRR as

indicated in table. The result shows that banks with better CAR would have higher ROA keeping LLPR, CRR and NPLR constant. Similarly, increase in LLPR by Re.1 leads to increase in ROA by Re. 0.0153 holding the CAR, NPLR and CRR variable constant and increase in NPLR by Re.1 leads to decrease in ROA by Re. 0.029 holding the CAR, LLPR and CRR constant and increase in CRR by Re. 1 lead to decrease in ROA by Rs. 0.031 keeping CAR, LLPR and NPLR constant. The beta coefficient is significant for total CAR, LLPR, NPLR and CRR. The constant a=20.13 indicated that if all variables used in this model is zero, ROA is Re. 15.0.

The value of multiple coefficient of determination (R^2) is 0.829 in NIC Asia bank indicated that 82.9% of total variation in ROA of this bank is explained by independent variables and only 17.1% is explained by other variables. The significant values of CAR, LLPR, NPLR and CRR are respectively 0.0113 lesser than 0.05, 0.0598 is greater than 0.05, 0.0598 greater than 0.05 and 0.0795 greater than 0.05 which shows that there exist significant relationship between dependent variable ROA with independent variable CAR and not significant ROA with LLPR, NPLR and CRR. Further the significant value of F is 0.0171 which is lesser than 0.05 (level of significant) which shows the overall linear regression model is significant.

The regression model is $\hat{Y}_{ROA} = 17.21 + 0.014X_{CAR} + 0.0143X_{LLPR} - 0.014X_{NPLR} - 0.027X_{CRR}$. The reported results also include the values of F-statistics (F) and coefficient of determinants (R^2). The regression of dependent variable of ROA shows that beta coefficient for total CAR and LLPR are positive except NPLR and CRR as indicated in table. The result shows that banks with better CAR would have higher ROA keeping LLPR, CRR and NPLR constant. Similarly, increase in LLPR by Re.1 leads to increase in ROA by Re. 0.0143 holding the CAR, NPLR and CRR variable constant and increase in NPLR by Re.1 leads to decrease in ROA by Re. 0.014 holding the CAR, LLPR and CRR constant and increase in CRR by Re. 1 lead to decrease in ROA by Rs. 0.027 keeping CAR, LLPR and NPLR constant. The beta coefficient is significant for total CAR, LLPR, NPLR and CRR. The constant a=17.21 indicated that if all variables used in this model is zero, ROA is Re. 17.21.

Table 9

Multiple regression analysis of ROA on CAR, LLPR, NPLR and CRR of MBL Bank

(Regression Equation: $\hat{Y}_{ROA} = \beta_0 + \beta_1 X_{CAR} + \beta_2 X_{LLPR} + \beta_3 X_{NPLR} + \beta_4 X_{CRR} + e$)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.970	.940	.938	12.980	.938	13.978	9	9	.003

a Predictors: (Constant), CAR, LLPR, NPLR, CRR

Table 10

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.21	5.132		3.701	.021
	CAR	0.014	.682	.014	2.165	.014
	LLPR	0.0143	.340	0.0132	3.125	.019
	NPLR	-0.014	-1.173	-.009	-3.012	.017
	CRR	-0.027	-1.207	-.027	-3.011	.013

a Dependent Variable: ROA

Note. *Calculated from SPSS Computer Software*

The value of multiple coefficient of determination (R^2) is 0.940 in MBL bank indicated that 94.0% of total variation in ROA of this bank is explained by independent variables and only 6% is explained by other variables. The significant values of CAR, LLPR, NPLR and CRR are respectively 0.014 lesser than 0.05, 0.019 is lesser than 0.05, 0.017 lesser than 0.05 and 0.013 lesser than 0.05 which shows that there exist significant relationship between dependent variable ROA with independent variable CAR, LLPR, NPLR and CRR. Further the significant value of F is 0.003 which is lesser than 0.05 (level of significant) which shows the overall linear regression model is significant.

Table 11

Multiple regression analysis of ROE on CAR, LLPR, NPLR and CRR of KBL Bank

(Regression Equation: $\hat{Y}_{ROE} = \beta_0 + \beta_1 X_{CAR} + \beta_2 X_{LLPR} + \beta_3 X_{NPLR} + \beta_4 X_{CRR} + e$)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.977	.954	.953	12.1050	.954	11.130	9	9	.0012

a Predictors: (Constant), CAR, LLPR, NPLR, CRR

Table 12

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.20	3.462		2.973	.017
	CAR	0.014	.692	.015	4.681	.002
	LLPR	0.0112	.360	0.0151	3.782	.0111
	NPLR	-0.010	-1.174	-.012	-3.091	.009
	CRR	-0.022	-1.284	-.024	-3.082	.011

a Dependent Variable: ROE

Note. *Calculated from SPSS Computer Software*

The regression model is $\hat{Y}_{ROE} = 18.13 + 0.014X_{CAR} + 0.0112X_{LLPR} - 0.010X_{NPLR} - 0.022X_{CRR}$. The reported results also include the values of F-statistics (F) and coefficient of determinants (R^2). The regression of dependent variable of ROE shows that beta coefficient for total CAR and LLPR are positive except NPLR and CRR as indicated in table. The result shows that banks with better CAR would have higher ROA keeping LLPR, CRR and NPLR constant. Similarly, increase in LLPR by Re.1 leads to increase in ROE by Re. 0.0112 holding the CAR, NPLR and CRR variable constant and increase in NPLR by Re.1 leads to decrease in ROE by Re. 0.010 holding the CAR, LLPR and CRR constant and increase in CRR by Re. 1 lead to decrease in ROE by Rs. 0.022 keeping CAR, LLPR and NPLR constant. The beta coefficient is significant for total CAR, LLPR, NPLR and CRR. The constant a=18.20 indicated that if all variables used in this model is zero, ROA is Re. 18.20.

The value of multiple coefficient of determination (R^2) is 0.954 in KBL bank indicated that 95.4% of total variation in ROE of this bank is explained by independent variables and only 4.6% is explained by other variables. The significant

values of CAR, LLPR, NPLR and CRR are respectively 0.02 lesser than 0.05, 0.0111 is lesser than 0.05, 0.009 lesser than 0.05 and 0.011 lesser than 0.05 which shows that there exist significant relationship between dependent variable ROA with independent variable CAR, LLPR, NPLR and CRR. Further the significant value of F is 0.0012 which is lesser than 0.05 (level of significant) which shows the overall linear regression model is significant.

Table 13

Multiple regression analysis of ROE on CAR, LLPR, NPLR and CRR of NIC Asia Bank Limited

(Regression Equation: $\hat{Y}_{ROE} = \beta_0 + \beta_1 X_{CAR} + \beta_2 X_{LLPR} + \beta_3 X_{NPLR} + \beta_4 X_{CRR} + e$)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.960	.921	.920	7.280	.921	6.930	9	9	.0122

a Predictors: (Constant), CAR, LLPR, NPLR, CRR

Table 14

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.05	16.154		2.085	.0185
	CAR	0.08	.385	0.058	3.940	.0172
	LLPR	0.0123	.354	0.0172	4.502	.0680
	NPLR	-0.024	.325	-0.032	-3.172	.0720
	CRR	-0.042	0.378	-0.0401	-3.577	0.0802

a Dependent Variable: ROE

Note. *Calculated from SPSS Computer Software*

The regression model is $\hat{Y}_{ROE} = 19.0 + 0.08X_{CAR} + 0.0123X_{LLPR} - 0.024X_{NPLR} - 0.042X_{CRR}$. The reported results also include the values of F-statistics (F) and coefficient of determinants (R^2). The regression of dependent variable of ROE shows that beta coefficient for CAR and LLPR are positive except NPLR and CRR as indicated in table. The result shows that banks with better CAR would have higher ROE keeping LLPR, CRR and NPLR constant. Similarly, increase in LLPR by Re.1 leads to increase in ROE by Re. 0.0123 holding the CAR, NPLR and CRR variable constant and increase in NPLR by Re.1 leads to decrease in ROE by Re. 0.024

holding the CAR, LLPR and CRR constant and increase in CRR by Re. 1 lead to decrease in ROE by Rs. 0.042 keeping CAR, LLPR and NPLR constant. The beta coefficient is significant for total CAR, LLPR, NPLR and CRR. The constant a=19.05 indicated that if all variables used in this model is zero, ROE is Re. 19.05.

The value of multiple coefficient of determination (R^2) is 0.921 in NIC Asia bank indicated that 92.1% of total variation in ROE of this bank is explained by independent variables and only 7.9% is explained by other variables. The significant values of CAR, LLPR, NPLR and CRR are respectively 0.0172 lesser than 0.05, 0.0680 is greater than 0.05, 0.0720 greater than 0.05 and 0.0802 greater than 0.05 which shows that there exist significant relationship between dependent variable ROE with independent variable CAR and not significant with LLPR, NPLR and CRR. Further the significant value of F is 0.0122 which is lesser than 0.05 (level of significant) which shows the overall linear regression model is significant.

Table 15

Multiple regression analysis of ROE on CAR, LLPR, NPLR and CRR of MBL Bank

(Regression Equation: $\hat{Y}_{ROE} = \beta_0 + \beta_1 X_{CAR} + \beta_2 X_{LLPR} + \beta_3 X_{NPLR} + \beta_4 X_{CRR} + e$)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.940	.883	.881	15.350	.883	11.213	9	9	.005

a Predictors: (Constant), CAR, LLPR, NPLR, CRR

Table 16

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.980	5.285		3.651	.025
	CAR	0.0121	.781	.013	2.753	.017
	LLPR	0.0145	.502	0.0145	3.568	.013
	NPLR	-0.016	-1.144	-.007	-3.048	.014
	CRR	-0.025	-1.125	-.026	-3.098	.015

a Dependent Variable: ROE

Note. *Calculated from SPSS Computer Software*

The regression model is $\hat{Y}_{ROE} = 13.980 + 0.0121X_{CAR} + 0.0145X_{LLPR} - 0.016X_{NPLR} - 0.025X_{CRR}$. The reported results also include the values of F-statistics (F) and coefficient of determinants (R^2). The regression of dependent variable of ROE shows that beta coefficient for total CAR and LLPR are positive except NPLR and CRR as indicated in table. The result shows that banks with better CAR would have higher ROE keeping LLPR, CRR and NPLR constant. Similarly, increase in LLPR by Re.1 leads to increase in ROE by Re. 0.0145 holding the CAR, NPLR and CRR variable constant and increase in NPLR by Re.1 leads to decrease in ROE by Re. 0.016 holding the CAR, LLPR and CRR constant and increase in CRR by Re. 1 lead to decrease in ROA by Rs. 0.025 keeping CAR, LLPR and NPLR constant. The beta coefficient is significant for total CAR, LLPR, NPLR and CRR. The constant a=13.980 indicated that if all variables used in this model is zero, ROA is Re. 13.980.

The value of multiple coefficient of determination (R^2) is 0.883 in MBL bank indicated that 88.30% of total variation in ROE of this bank is explained by independent variables and only 11.7% is explained by other variables. The significant values of CAR, LLPR, NPLR and CRR are respectively 0.017 lesser than 0.05, 0.013 is lesser than 0.05, 0.014 lesser than 0.05 and 0.015 lesser than 0.05 which shows that there exist significant relationship between dependent variable ROA with independent variable CAR, LLPR, NPLR and CRR. Further the significant value of F is 0.005 which is lesser than 0.05 (level of significant) which shows the overall linear regression model is significant.

4.3 Results

From the above analyses of credit risks, following major findings have been obtained:

1. The study found that the loans and advances to total risk weighted assets ratio are fluctuating trend of KBL, MBL and NIC Asia. RWA is increasing year by year because of the increase in total loan and advances in sample banks. The overall ratio of KBL is 84.20% where as ratio in MBL and NIC Asia are 107.06% and 79.55%. From this, it is clear that out of total risk weighted assets in balance items the proportion of loans and advances is lower in NIC Asia as compared to KBL and MBL. This means that the credit risk is higher in KBL and MBL as compared to NIC Asia. Likewise, the standard deviation

of KBL, MBL and NIC Asia are 5.03, 20.11 and 16.79 respectively. This indicates that the ratio deviate more from the average in case of MBL and NIC Asia than KBL.

2. The study found that the trend of NPL to Total loans and advances ratio of KBL is in a fluctuating trend. This trend shows that the proportion of KBL, MBL and NIC Asia is decreasing year by year. This is mainly because sample banks seem more serious regarding credit monitoring and risk management.

3. The study found the MBL has the higher ratio in all years except in fiscal year 2015/16. The NPL ratio of KBL is more fluctuating than the MBL and NIC Asia. The average ratios of NPL of KBL, MBL and NIC Asia are 135.66%, 211.92% and 141.12% respectively. This shows that MBL has provided higher cushion of provisioning to non-performing loan compared to KBL and NIC Asia. The standard deviation of KBL, MBL and NIC Asia are 50.64, 90.38 and 65.39 respectively. This means that there exists the higher deviation in the ratio from the average ratio in context of MBL than KBL and NIC Asia.

4. Since high provision has to be made for non-performing loan, higher provision for loan loss reflects increasing non-performing loan in volume of total loans and advances. The low ratio signifies the good quality of assets in the volume of loans and advances and makes efforts to cope with probable loan loss. Higher ratio implies that the bank has the higher proportion of NPL in bank loan portfolio and thus the bank is greater exposed to the credit risk. The study found that the sample banks have least portion of loan loss provision. This means that sample banks have least amount of non-performing loan. The average LLP to total loan and advances ratio is 2.51, 1.46 and 1.89% of KBL, MBL and NIC Asia respectively. The ratio is higher in KBL and NIC Asia than MBL. This higher ratio reflects that the KBL and NIC Asia has higher non-performing loan compared to MBL.

5. Likewise the Standard deviation of KBL, MBL and NIC Asia are 1.56, 0.42 and 1.05 respectively, from this, it is clear that the ratio of KBL and NIC Asia have higher deviation from its average ratio and so have higher risk than that of MBL.

6. The study found that over the ten years the KBL has extended the credit mostly against the Movable/non Movable Property. The average lending against the movable/ non-movable property is 5538 million, which is the highest among the lending against all securities. The bank has not granted any loan without collateral, which is the good sign of lending practice. The bank even does not have lending against the guarantee of internationally rated bank and counter guarantee.

7. The study found that the MBL has extended against the 8 Securities. The MBL has granted the highest amount of loan against the Movable/ Non- Movable property, the average lending against this collateral for the past ten years is Rs 4,568 million. Likewise the average loan against the other securities than above mentioned is Rs 502 million, which is ranked 2. The loan granted against the guarantee of local licensed institutions, other bank's FDR, own bank's FDR is ranked 3, 4 & 6 respectively. The bank has granted least amount of loan against the Personal Guarantee and Government bonds and no any loans against government guarantee, guarantee of internationally rated bank, export documents and counter guarantee.

8. On the contrary to KBL, MBL and NIC Asia also have extended the loan without the collateral. The average loan granted without collateral is Rs 10 million, which is ranked 8. From this it is clear that the MBL has higher risk on the lending than that in KBL and NIC Asia. The MBL has granted loan without collateral, which indicates the bank has the higher risk because higher provision amount and lack of collateral.

9. The study found that over the ten years the NIC Asia has extended the credit mostly against the Movable/non Movable Property. The average lending against the movable/ non-movable property is 5658 million, which is the highest among the lending against all securities. The bank has not granted any loan without collateral, which is the good sign of lending practice. The bank even does not have lending against the guarantee of internationally rated bank and counter guarantee. The bank has extended least credit against the personal guarantee, which is ranked 9th position on the basis of average amount of lending. The bank also has been granting loan against the more liquid and

secured collateral such as Government bonds, own bank's Fixed Deposit Receipt (FDR) and other banks FDR, which is ranked 6, 7, and 5 respectively.

10. The study found that KBL has the highest lending on 100% risk weighted lending i.e. on high-risk category lending. The bank has extended 0.79, 2.62, 3.62, 0.03% and 0.32% of total lending against the risk-free collateral (i.e. own banks FDRs and Government bonds) in fiscal year 2017/18, 2018/19, 2019/20, 2020/21 and 2021/22 respectively.

11. The study found that NIC Asia has the highest lending on 100% risk weighted lending i.e. on high-risk category lending. The bank has extended 1.80, 1.81, 1.60, 0.10% and 0.40% of total lending against the risk-free collateral (i.e. own banks FDRs and Government bonds) in fiscal year 2017/18, 2018/19, 2019/20, 2020/21 and 2021/22 respectively.

12. The study found that KBL, MBL and NIC Asia have invested highest of 30.86%, 50.22% and 40.85% of total loan in Construction, Metal Productions, Machinery & Electric Tools & Fittings and Construction sector where as sample banks have extended least credit in Agriculture and Mining sector. Loan to local government is the neglected area in sample the banks. It seems that MBL is highly concentrated with 50.22% of its loan in Metal Productions, Machinery & Electric Tools & Fittings sector and has very less portion of its loan on consumer loan sector.

13. It is also clear that credit concentration on single sector of MBL is more than that of KBL and NIC Asia. This indicates that MBL has higher concentration risk on Metal Productions, Machinery & Electric Tools & Fittings sector, as the exposure on this sector is 50.22% and 30.86% of construction for KBL of total loan respectively.

14. The study found that the percentage of loan on single sector to core capital of KBL, MBL and NIC Asia has crossed 50 % in 4 and 5 sectors respectively. Out of them, the sector wise loan to core capital ratio of KBL, MBL and NIC Asia has crossed 100% in construction sector.

15. Based on the results of correlation between dependent variable and independent variables, it can be found that there is positive significant

relationship of CAR and CRR with ROA and ROE and negative significant relationship of LLPR and NPLR with ROA and ROE.

16. The value of multiple coefficient of determination (R^2) is 0.998 in KBL bank indicated that 99.8% of total variation in ROA of this bank is explained by independent variables and only 0.02% is explained by other variables. The t value of coefficient of CAR, LLPR, NPLR and CRR are statistically significant given model at 5% level of significance; therefore the regression equation could provide statistically significant explanation of variation in the ROA due to CAR, LLPR, NPLR and CRR.

17. The value of multiple coefficient of determination (R^2) is 0.829 in NIC Asia bank indicated that 82.9% of total variation in ROA of this bank is explained by independent variables and only 17.1% is explained by other variables. The t value of coefficient of CAR, LLPR, NPLR and CRR are statistically significant given model at 5% level of significance; therefore the regression equation could provide statistically significant explanation of variation in the ROA due to CAR, LLPR, NPLR and CRR.

18. The value of multiple coefficient of determination (R^2) is 0.940 in MBL bank indicated that 94.0% of total variation in ROA of this bank is explained by independent variables and only 6% is explained by other variables. The t value of coefficient of CAR, LLPR, NPLR and CRR are statistically significant given model at 5% level of significance; therefore the regression equation could provide statistically significant explanation of variation in the ROA due to CAR, LLPR, NPLR and CRR.

19. The value of multiple coefficient of determination (R^2) is 0.954 in KBL bank indicated that 95.4% of total variation in ROE of this bank is explained by independent variables and only 4.6% is explained by other variables. The t value of coefficient of CAR, LLPR, NPLR and CRR are statistically significant given model at 5% level of significance; therefore the regression equation could provide statistically significant explanation of variation in the ROE due to CAR, LLPR, NPLR and CRR.

20. The value of multiple coefficient of determination (R^2) is 0.921 in NIC Asia bank indicated that 92.1% of total variation in ROE of this bank is explained by independent variables and only 7.9% is explained by other variables. The t value of coefficient of LLPR, NPLR and CRR are not statistically significant in given model at 5% level of significance but significant with CAR; however F-value is lesser than 0.05, therefore the regression equation could provide statistically significant explanation of variation in the ROE due to CAR, LLPR, NPLR and CRR.

21. The value of multiple coefficient of determination (R2) is 0.883 in MBL bank indicated that 88.30% of total variation in ROE of this bank is explained by independent variables and only 11.7% is explained by other variables. The t value of coefficient of CAR, LLPR, NPLR and CRR are statistically significant given model at 5% level of significance; therefore the regression equation could provide statistically significant explanation of variation in the ROE due to CAR, LLPR, NPLR and CRR.

4.4 Discussion

The study found that MBL has higher concentration risk than KBL and NIC Asia as MBL has extended more loans in few sectors than KBL and NIC Asia. KBL, MBL and NIC Asia has highest ratio in Metal and Electric Products and construction sector, which is 203.76%, 192.83% and 201.75% respectively. In this sector also, the ratio of KBL is higher than that of MBL and NIC Asia. There is wide range of differences in the ratio of different loan sectors of MBL than that of KBL and NIC Asia. The Default probability of NIC Asia is higher than that of KBL and MBL (5.72%>5.68 % > 4.67%). Therefore, it is concluded that NIC Asia has higher credit risk or default risk than that of KBL and MBL in terms of its interest on loan. This is due to the situation of adverse selection. In the loan market, the adverse selection is the situation that occurs as the interest rate rises and the honest borrowers decide not to borrow. The bank is left with an adverse pool of borrowers – those who know they are more likely to default. Thus due to the higher average interest rate of NIC Asia, it has more default probability than KBL and MBL.

The finding of this study shows that there is significantly relationship between credit risk management and the profitability. The study shows a positive relationship between CAR with ROA and ROE. The result shows that increase in capital adequacy ratio leads to significant increase in the profitability of the banks. Importantly this outcome is consistent with the finding provided in Kwadwo, (2020), Konovalova , Kristovska & Kudinska (2017), Shahzad (2019), Nguyen, (2020) and Mekasha (2011). Similarly, LLPR has an insignificant negative relationship with ROA and positive insignificant relationship with ROE. Similarly, LLPR has insignificant positive relationship with ROA and ROE. The result indicates that increase in LLPR leads to increase in the profitability. The result is supported with the findings of Kwadwo, (2020), Konovalova , Kristovska & Kudinska (2017). In addition, from most of other studies reviewed there were mixed results and were unable to establish a relationship between LLPR and bank profitability.

Another empirical finding from the regression analysis shows that there is insignificant another empirical finding from the regression analysis shows that there is insignificant negative relationship between NPLR with ROA and ROE. This outcome is consistent with finding of Kwadwo, (2020), Konovalova , Kristovska & Kudinska (2017), Shahzad (2019) and Nguyen, (2020). The results indicate that increase in NPLR leads to decrease in the profitability of the banks. Likewise, the findings of the study show that there is statistically significant negative relationship of CRR with ROE the result is supported with the findin7g of Konovalova , Kristovska & Kudinska (2017), Shahzad (2019) and Nguyen (2020). Finally, CRR has insignificant negative relationship with the ROA and significant negative relationship with ROE of the banks. The result can be explained as increases in CRR leads to decreases in the profitability of the banks. This result is supported with the findings of Kristovska & Kudinska (2017) and Shahzad (2019). So, there is different result with different topic under credit risk management but this study included almost part of financial performance.

CHAPTER V

SUMMARY AND CONCLUSIONS

5.1 Summary

Economic development is not possible without the proper development of banking sector in a country, as banks are the real facilitator for mobilizing the resources. Banks are the institutions, which collect the scattered small savings from the public and invest them into productive sector that ultimately contributes to economic development of a country. Besides providing the services for economic development, they are established to earn profit. In the context of current competitive scenario, banks need to face challenges from all around. One of the major challenges for Nepalese commercial banks is to properly manage the risk, especially the credit risk as it covers about 60% of the total risk that a bank face. Considering the importance of credit risk management in commercial banks, this research aimed at studying the credit risk management system of selected commercial banks. Nepal Rastra Bank issued directives to commercial banks to increase their paid up capital up to 8 billion after 2017 A.D. It became the most challenging task for commercial banks; risk associated with credit is clearly point out the following issues which is faced by commercial joint venture banks or other commercial banks. In order to analyze the impact of credit risk management of commercial bank the research questions are; what are the indicators and position of credit risk management of sample banks?, what is the position of security wise lending of sample banks?, what is relationship between credit risk management and profitability of sample banks? and what is the impact of credit risk management on profitability of sample banks?

The general objective of the study is to examine and analyze how the selected commercial banks have managed mainly credit risk in this competitive Nepalese banking industry. The specific objectives of this study are: to analyze the credit risk position of Nepalese commercial banks, to analyze the indicators of credit risk management of Nepalese commercial banks, and to minimize the credit risks management present in the commercial banks on the basis of NRB guidelines.

For this purpose, descriptive cum correlation research design was adopted. Out of total population of 20 commercial banks (till Mid July, 2023), 3 banks were taken as sample using purposive sampling method. KBL, MBL and NIC Asia have been taken for comparative study because of their similarities in terms of business size, date of establishment, capital size etc. Secondary data have been used in this study. Annual reports and other publication of these banks and NRB directives and reports are the bases of secondary data. The data collection from various sources are recorded systematically and presented. Appropriate statistical and financial tools have been applied to analyze the date. The data of ten consecutive years of the three banks have been analyzed to meet the objective of the study.

5.2 Conclusion

Proper risk management is required to remain competitive in the market & achieve the goals. The major banking risks include credit risk, market risk (i.e. liquidity risk, interest risk, operation risk etc). Among these risks, credit risk has the major impact on banking (i.e. more than 60 %). Because of the credit risk, the non-performing loan (NPL) of bank will increase. With the increase in NPL, the loan loss provisioning will also increase simultaneously leading to decrease in profit. The decrease in profit results in low dividend to shareholder and bonus to employees.

The entire study concluded that the bank's total credit management is good and reasonable. Higher risk index attributes of the bank has the higher expected ROA, strong capital position and stable earning on ROE. Its current position shows that it has the high level of cushion to absorb accounting losses. The study concluded that the regression coefficient of loan loss provision for ROA and ROE is positive but the value is not significant at 5 percent level of significance for other sample banks except NIC ASIA, which indicates that, the very low relationship between the independent variable PLL and dependent variable ROA and ROE.

Regarding to the objective of the study, the mean CAR of the all sample banks have above the regulatory requirements i.e. above 11% which shows that all banks have become successful to minimize its risk to maintain standard capital as adequate as required by regulations. The mean LLPR of RBBL has found to be highest among other sample banks which shows that a greater ability of the banks to face the loan

loss. The NPLR of all the sample banks have below the limit set by Nepal Rastra Bank i.e. 5% which shows that the condition of all banks in credit recovery is good. Mean CRR of all sample bank have more than 3%. According to NRB directive 2079/80, CRR should not be less than the 3% of the bank's total deposit. Therefore, the overall mean value of CRR is satisfactory level.

Similarly, relating to objective, the finding of the study period revealed that CAR has positive significant correlation with profitability. Similarly, LLPR has positive insignificant correlation with ROA and ROE. Likewise, NPLR has negative insignificant correlation with profitability. Finally, CRR has negative significant correlation with ROA and ROE.

The study concluded that that 92.7% changes in ROA of sample commercial banks explained by CAR, LLPR, NPLR and CRR and remaining 7.3% contributes by other unknown factors. Similarly, 93.5% changes in ROE of sample commercial banks explained by CAR, LLPR, NPLR and CRR and remaining 6.5% contributed by other unknown factors. The regression analysis also concluded that CAR has significant positive relationship with profitability, where it has been observed that capital adequacy ratio is a major influencer of profitability of the banks.

The overall result concluded that the credit risk management is an important predicator for the profitability of banks. Therefore, the success of the bank in term of profitability depends on its credit risk management.

5.3 Implications

From the above analysis of the credit risk management procedure of KBL, MBL and NIC Asia, following implications are made to these banks, NRB and Nepal government in respect to credit risk management:

Following general recommendations can be made to these banks regarding credit risk management

1. In the current context, sample banks have been applying old techniques for managing the credit risk. These techniques should be changed with changes in the

environmental forces. They can also conduct comprehensive stress and scenario testing on all of their portfolios and counter parties to measure the credit risk.

2. Sample banks need to upgrade the credit risk analysis system with the changes in both level and pace of technological changes in external environment. The credit risk management should be used as a strategic management tool to align Risk Adjusted Return on Economic Capital (RAROC) with ROE. These are the key tools for credit that can enable banks to select optimal portfolios and allocate their resources locally into branches, regionally and globally.
3. The banks should believe that credit risk management is really about maximizing shareholder value and that NRB Directives and the Basel II are "compliance". They should believe that credit risk management is critically important so as to ensure that they do not get downgraded by rating agencies
4. The bankers should be able to think that Basel II and NRB Directives are not just a compliance issue but rather an opportunity to use credit risk management as a cornerstone of strategic decision making. Following the directives of NRB and acting upon it also reduces bank's risk. Therefore, sample the banks are recommended to adhere to the directives and come up with a stronger internal audit and compliance to ensure that the directives are properly followed up.
5. It is often said, " Prevention is better than cure". Hence it is recommended for sample banks to take preventive measures before the risk occur and will suffer loss. Sample banks are recommended to develop an information system to gather all the possible information and activities to take timely precaution.
6. It has been found that MBL has extended the credit without backing any collateral. This sort of practice seems risky and non-profitable, as there is least chance of covering default loan when there is no collateral and 100 % provision of loan amount need to be maintained. So MBL needs to stop lending without any collateral.
7. KBL, MBL and NIC Asia have higher amount of loan and advances in total risk weighted assets. So to minimize the credit risk, the diversification in investment is needed in sample banks. These banks need to diversify investment in government bonds and placements etc.

8. KBL, MBL and NIC Asia banks need to properly diversify its lending portfolio. The high amount of lending in manufacturing sectors need to be diversified into various sectors, which will decrease concentration risk.
9. KBL, MBL and NIC Asia banks have extended the highest amount of loan against the movable and non-movable property, which has 100 % risk weight. So KBL, MBL and NIC Asia banks need to diversify its lending against different securities.
10. NPL of KBL and NIC Asia is increasing with the increase in loan and advances. So, KBL and NIC Asia need to be more careful while taking credit decision.
11. MBL should change the organizational structure for proper credit risk management. Recovery Cell is needed in MBL for timely recovery of loan. Similarly, a separate department is needed to be formed for assessing the credit risk.
12. KBL, MBL and NIC Asia need to follow principles for the proper credit risk management;

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ABSTRACT Emerging research in both developed and developing nations has focused on the connection between credit risk and the performance of commercial banks. Examining and analyzing the chosen commercial banks' primary risk management practices in this cutthroat Nepalese banking market is the major goal of this study. The particular goals are to assess the credit risk position of Nepalese commercial banks, evaluate the credit risk management indicators of these banks, and reduce the credit risk management that exists in these banks in accordance with NRB requirements. Only three of the study's twenty commercial banks—Kumari Bank Ltd., Machhapuchhre Bank Ltd., and NIC Asia Bank Ltd.—have been chosen in order to meet its objectives. Secondary sources of data