

**CREDIT RISK MANAGEMNT AND IT'S IMPACT ON PROFITABILITY  
OF NEPALESE COMMERCIAL BANKS**

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

By

Roshan Sharma

Roll No: 3916/18

T.U. Regd. No: 7-2-297-379-2013

Central Department of Management, Tribhuvan University

Kirtipur, Kathmandu

March, 2021

## CERTIFICATION OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled "**Credit Risk Managemnt and It's Impact on Profitability of Nepalese Commercial Banks**". The work of this dissertation has not been submitted previously for the purpose of conferral of any degrees nor it has been proposed and presented as part of 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.

.....

Roshan Sharma

March, 2021

**REPORT OF RESEARCH COMMITTEE**

Mr Roshan Sharma has defended research proposal entitled "**Credit Risk Managemnt and It's Impact on Profitability of Nepalese Commercial Banks**" successfully. The research committee has registered the dissertation for further progress. It is recommended to carry out the work as per suggestions and guidance of supervisor Ass. Prof. Phul Prasad Subedi and submit the thesis for evaluation and viva voce examination.

.....

Ass. Prof Phul Prasad Subedi  
Dissertation Proposal Supervisor

**Dissertation Proposal Defended Date:**  
.....

.....

Ass. Prof Phul Prasad Subedi  
Dissertation Supervisor

**Dissertation Submitted Date:**  
.....

.....

Prof. Dr. Sanjay Kumar Shrestha  
Chairperson, Research Committee

**Dissertation Viva Voce Date:**  
.....

## **APPROVAL SHEET**

We have examined the dissertation Credit Risk Managemnt and It's Impact on Profitability of Nepalese Commercial Banks presented by Roshan Sharma for the degree of **Master of Business Studies** (MBS). We hereby certify that the dissertation is acceptable for the award of degree.

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**Ass. Prof. Phul Prasad Subedi**

**Dissertation Supervisor**

---

**Ass. Prof. Nirajan Basnet**

**Internal Examiner**

---

**Prof. Dr. Bal Ram Duwal**

**External Examiner**

---

**Prof. Dr. Sanjay Kumar Shrestha**  
**Chairperson, Research Committee**

---

**Prof. Dr. Ramji Gautam**

**Head of Department**

**Date:... March 2021**

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Central Department of Management

## TABLE OF CONTENTS

<b>CONTENTS</b>	<b>PAGE NO.</b>
<i>Title page</i> .....	<i>i</i>
<i>Certificate of authorship</i> .....	<i>ii</i>
<i>Report of research committee</i> .....	<i>iii</i>
<i>Approval sheet</i> .....	<i>iv</i>
<i>Acknowledgements</i> .....	<i>v</i>
<i>Table of contents</i> .....	<i>vi</i>
<i>List of tables</i> .....	<i>viii</i>
<i>List of figures</i> .....	<i>viii</i>
<i>Abbreviations</i> .....	<i>ix</i>
<i>Abstracts</i> .....	<i>x</i>
<b>CHAPTER 1: INTRODUCTION.....</b>	<b>1-8</b>
1.1 Background of the study.....	1
1.2 Problem statement.....	5
1.3 Objectives of the study.....	6
1.4 Hypothesis.....	6
1.5 Rationale of the study.....	6
1.6 Limitations of the study.....	7
1.7 Chapter plan.....	7
<b>CHAPTER 2: LITERATURE REVIEW.....</b>	<b>8-37</b>
2.1 Introduction.....	8
2.2 Conceptual review.....	8
2.3 Empirical review.....	28
2.4 Conceptual framework.....	34
2.5 Research gap.....	37
<b>CHAPTER 3: RESERCH METHODOLOGY.....</b>	<b>38-43</b>
3.1 Introduction.....	38

3.2 Research design.....	38
3.3 Population and sample.....	38
3.4 Sources of data.....	39
3.5 Data collection and processing procedures.....	39
3.6 Data analysis tools and technique.....	39
<b>CHAPTER 4 RESULTS AND DISCUSSION.....</b>	<b>44-57</b>
4.1 Presentation of data.....	44
4.2 Major findings.....	54
4.3 Discussion.....	56
<b>CHAPTER 5: SUMMARY AND CONCLUSION.....</b>	<b>58-61</b>
5.1 Summary.....	58
5.2 Conclusion.....	59
5.3 Implications.....	61
<b>REFERENCES.....</b>	<b>62</b>
<b>APPENDICES.....</b>	<b>65</b>

**LIST OF TABLES**

Table 4.1	:	Descriptive statistics	45
Table 4.2	:	Capital adequacy	46
Table 4.3	:	Non-performing loan ratio	47
Table 4.4	:	Cash reserve ratio	48
Table 4.5	:	Assets growth ratio	49
Table 4.6	:	Return on assets ratio	50
Table 4.7	:	Return on equity	51
Table 4.8	:	Correlation between ROA and independent variable	52
Table 4.9	:	Correlation between ROE and independent variable	52
Table 4.10	:	Model I Regression coefficient (ROA)	53
Table 4.11	:	Model II Regression coefficients (ROE)	54

**LIST OF FIGURES**

Figure 2.1	:	Relation between Risk and Return	26
Figure 2.2	:	Theoretical Framework	35



**ABBREVIATIONS**

A.D.	:	Anno Domini
ABBS	:	Any Branch Banking Service
AGR	:	Assets Growth Ratio
ATM	:	Automated Teller Machine
CAR	:	Capital Adequacy Ratio
CPI	:	Consumer price index
CRR	:	Cash Reserve Ratio
CV	:	Coefficient Of Variation
D-E	:	Debts Equity
EBL	:	Everest Bank Limited
FY	:	Fiscal Year
GDP	:	Gross domestic product
GSTI	:	Government Security to Total Assets
i.e.	:	That is
L/C	:	Letter Of Credit
Ltd.	:	Limited
MBL	:	Machhapuchhhre Bank Limited
NBL	:	Nepal Bank Limited
NPLR	:	Non-Performing Loan
Nrs	:	Nepalese Rupees
P.E.	:	Probable Error
PNB	:	Panjab Nationl Bank
r	:	Correlation
ROA	:	Return On Assets
ROE	:	Retun On Equity
SD	:	Standard Deviation

## ABSTRACT

This study aimed at examining the credit risk of commercial bank in Nepal. The Descriptive research design has been adopted for the study. The study used a secondary data for three commercial bank. The pooled data of three Nepalese commercial bank for the period 2010/11 to 2019/20. have been analyzed using different financial ratios and statistical tools. Data is obtained from banks annual report and Nepal Rastra banks annual supervision report. ROA and ROE is taken as profitability indicator and capital adequacy ratio, debts equity ratio, assets growth ratio, government security investment ratio and non-performing loan ratio are determinants of risk. The overall criteria to evaluate the banking risk as a whole. It doesn't only consider the best part of the risk but it assumes what is the major risk indicator and evaluate the banking risk in term of credit risk as a whole.

Based on the finding, it is recommended that the banks should safe investment, make better collateral, and portfolio investment by mitigate the risk because it gives the life to the institutions for the coming days. They should also focus on their assets quality to ensure their existence in long run. The liquidity position of the sample banks should meet its current and contingent obligations.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the study

Banks are those financial institution that accepts deposits, offers checking account services, makes various loans, and offers basic financial products like certificates of deposit (CDs) and savings accounts to individuals and small businesses. A commercial bank is where most people do their banking. Commercial banks make money by providing and earning interest from loans such as mortgages, auto loans, business loans, and personal loans. Customer deposits provide banks with the capital to make these loans (Kagan, 2020). Commercial bank provides credit to its customer for the long and short terms periods.

Credit is generally defined as a contractual agreement in which a borrower receives something of value now and agrees to repay the lender at a later date generally with interest. Sometimes, it may even involve crediting a for instance. Credit also refers to the creditworthiness or credit history of an individual or company. It also refers to an accounting entry that either decreases assets or increases liabilities and equity on a company's balance sheet (Kenton, 2020).

Credit risk is the risk of loss that may result from a business partner's (also called counterparty) inability to reimburse a loan or fulfill other monetary promises when they become due. A counterparty may default because of bankruptcy or temporary financial problems. For example, a commercial bank lends \$1 million to a car dealer. The loan maturity is five years. If the dealer is out of business after six months, the bank may incur credit losses if it is unable to recover any amount in court (Codjia, 2017).

Credit risk is most simply defined as the potential that a bank borrower or counterparty fails to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximise a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Credit risk refers to the risk of default or non-payment or non-adherence to contractual obligations by a borrower. The revenue of banks comes primarily from interest on loans and

accordingly, loans form a major source of credit risk. Banks face credit risks from financial instruments such as acceptances, interbank transactions, trade financing, foreign exchange transactions, futures, swaps, bonds, options, settlement of transactions, and others.

The effective management of credit risks banks not only supports the liability and profitability of their own business but also contribute to an efficient allocation of capital in the economy. Presently, bank credit risk management becomes a major interest among academicians and practitioners. It may be difficult to establish an optimal credit policy as the best combination of the variables of credit policy is quite difficult to obtain. Firm's credit policy is greatly influenced by economic conditions (Pandey, 2008). As economic condition change, the credit policy may also change. Credit risk management is indeed a very difficult and complex task in the financial industry because of the unpredictable nature of the macroeconomics factors coupled with the various microeconomic variables which are peculiar to the banking industry or specific to particular bank (Garr, 2013). but also contribute to an efficient allocation of capital in the economy. Presently, bank credit risk management becomes a major interest among academicians and practitioners. It may be difficult to establish an optimal credit policy as the best combination of the variables of credit policy is quite difficult to obtain. Firm's credit policy is greatly influenced by economic conditions (Pandey, 2008). As economic condition change, the credit policy may also change. Credit risk management is indeed a very difficult and complex task in the financial industry because of the unpredictable nature of the macroeconomics factors coupled with the various microeconomic variables which are peculiar to the banking industry or specific to particular bank (Garr, 2013). The effective management of credit risks banks not only supports the liability and profitability of their own business.

### **Introduction of sample banks**

#### **Everest Bank Limited (EBL)**

Catering to more than 10 lacs customers, Everest Bank Limited (EBL) is a name you can depend on for professionalized & efficient banking services. Founded in 1994, the Bank has been one of the leading banks of the country and has been catering its

services to various segments of the society. With clients from all walks of life, the Bank has helped the nation to develop corporately, agriculturally & industrially.

Punjab National Bank (PNB), our joint venture partner (holding 20% equity) is one of the largest nationalized bank in India having presence virtually in all important centers. Owing to its performance during the year 2012-13, the Bank earned many laurels & accolades in recognition to its service & overall performance. Recently, PNB was awarded with “IDRBT Banking Technology Excellence Award” under Customer Management & Intelligence Initiatives. The Bank also bagged “Golden Peacock Business Excellence Award 2013” by Institute of Directors. Similarly, the Bank was recognized as ‘Best Public Sector Bank ‘by CNBC TV 18. The bank has now more than 7,000 branches and 8,500 ATMs spread all across India. As a joint-venture partner, PNB has been providing top management support to EBL under Technical Service Agreement.

Everest Bank Limited (EBL) provides customer-friendly services through its wide Network connected through ABBS system, which enables customers for operational transactions from any branches. The bank has 100 Branches, 132 ATM Counters, 31 Revenue Collection Counters and 3 Extension Counters across the country making it a very efficient and accessible bank for its customers, anytime, anywhere.

### **Nepal Bank Limited (NBL)**

Nepal Bank Limited, The first bank of Nepal was established in November 15, 1937 A.D (Kartik, 30, 1994). It was formed under the principle of Joint venture (Joint venture between govt. & general public). NBL's authorized capital was Rs. 10 million & issued capital Rs. 2.5 million of which paid-up capital was Rs. 842 thousand with 10 shareholders. The bank has been providing banking through its branch offices in the different geographical locations of the country.

In the absence of any bank in Nepal the economic progress of the country was being hampered and causing inconvenience to the people and therefore with the objective of fulfilling that need by providing service to the people and for the betterment of the country, this law in hereby promulgated for the establishment of the Bank and its operation

The total deposits for the first year was NRs. 17,02,025 where current deposits was about NRs. 12,98,898 fixed was about NRs. 3,88,964 and saving was NRs. 14,163.

Loan disbursed and outstanding at the end of the first year was NRs. 1,985,000. From the very conception and its creation, Nepal Bank Ltd, was as joint venture between the government and the private sector. Out of 2500 equity shares of NRs. 100 face value, 40% was subscribed by the government and the balanced i.e. 60% was offered for the sale to private sector. There were only 10 shareholders when the bank first started.

### **Machhapuchhre Bank Limited (MBL)**

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, 156 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.

Hence, the study attempts to analyze the relationship between profitability (measured by ROE, ROA) and credit risk (measured by non-performing loans, loan loss provisions, loans and advances).

## 1.2 Problem statement

Due to the cut through competition in the financial markets banks seem to be ready to grant much more loan, advances and other credit facilities against the spirit of credit policy guidelines. Unsecured loans and investment may cause the liquidation of those commercial banks on the funds. One wrongly invested without thinking any financial risk, systematic risk and their related facts, the bank cannot obtain profitable return as well as it should sometimes lose its principle (Poudel, 2017).

Credit risk management is indeed a very difficult and complex task in the financial industry because of the unpredictable nature of the macroeconomic factors coupled with the various microeconomic variables which are peculiar to the banking industry or specific to a particular bank. Unfortunately, banks in Ghana have found themselves in such an unpredictable macroeconomic environment for a very long time. While there are several strategies of addressing the problem of instability and efficiency, the research attempts to investigate the factors that influence the determination of the banks' credit risk (Garr, 2013).

Commercial banks of Nepal are exposed to five types of core risks through their operations which are credit risks, assets/liability risks, foreign exchange risks, internal control and compliance risks and money laundering risks. Among these risks management credit risks are complicated and more attention seeker. Credit risk is one of the vital risks for banks. Credit risks arise from non-performance by a borrower. It may arise from either an inability or an unwillingness to perform in the pre commitment contract manner. Credit risk affect book value of bank as well. The more credit risk, the more probability of bank to be insolvent.

This study seeks to answer the following research questions:

1. What is the status of credit risk management and profitability of commercial banks of Nepal?
2. What is the present status of non-performing loans, cash reserve ratio and capital adequacy ratio in commercial banks?
3. What is the relationship between credit risk indicators and profitability of Nepalese commercial banks?

### **1.3 Objectives of the study**

The main objectives of the study are to present the credit risk management and its impact on profitability of Nepalese commercial banks.

1. To analyze credit risk management and profitability of commercial banks of Nepal.
2. To examine the present status of non-performing loans, cash reserve ratio and capital adequacy ratio in commercial banks.
3. To analyze the relationship between credit risk management and profitability of Nepalese commercial bank.

### **1.4 Hypothesis**

A hypothesis is a proposed explanation for a phenomenon. The objective of setting hypothesis is to test the significant differences regarding the parameters of the population on the basis of sample drawn from population. In this study indicator of profitability are taken as dependent variables and indicator of credit risk are taken as independent variables.

H1: There is significant relationship between capital adequacy ratio and profitability.

H2: There is significant relationship between cash reserve ratio and profitability

H3: There is negative significant relationship between non-performing loan ration and profitability.

H4: There is negative significant relationship between assts growth ratio and profitability.

### **1.5 Rationale of study**

Owing to the increasing variety in the types of counter parties and the ever-expanding variety in the forms of obligations, credit risk management has jumped to the forefront of risk management activities carried out by commercial banks. It is designed to shed light on the current loan practices and its effect on banks. The study is substantial to commercial banks, regulatory bodies and government, academic researchers. It is serve as a reference material for research along similar topics. The researcher's knowledge on credit management depended through this study.



## **1.6 Limitation of study**

This study is made only for the partial fulfillment of master of business studies. This study is based on well-known or already estimated analytical methods. The basic limitations of study are:

1. Only impact of credit risk is considered for the purpose of the study, other risk are not considered in this research.
2. Only financial and statistical analysis used.
3. This study based on historical data.
4. Only three commercial banks are selected to carry out study.
5. The study covers only ten years period from FY 2010/11 to 2019/2020.
6. This study ignores macro credit risk indicators such as inflation, GDP etc.

## **1.7 Chapter plan**

This Study is divided into five chapters

### **Chapter 1: Introduction**

This chapter is introductory one which includes the background information of the subject matter of research undertaking to provide a general idea of its history. Background of the study and introduction of selected commercial banks are described in this chapter. Objective, limitation and significance of the study are also presented in this chapter.

### **Chapter 2: Literature review**

This chapter reviews the existing literature on the concept of determinants of financial performance analysis. It also includes the conceptual review of the related books, journals, articles and the published and unpublished research works as well as thesis.

### **Chapter 3: Research methodology**

Research methodology is an important aspect of any research which is presented separately in the third chapter. It shown what kind of data is used for the study, methods and techniques used in data collection, sample & population of the study, adopted tools of analysis are also presented in this chapter.

**Chapter 4: Results and discussion**

In this chapter collected and processed data are presented, analyzed and interpreted with using financial tools.

**Chapter 5: Summary and conclusion**

The whole study is concluded in the fifth chapter with summary, conclusion and meaningful suggestion made to improve the selected banks and banking sectors. Here recommendation is also given to the government and the NRB for better and updated rules and regulation on banking sector. In the last appendices & references are also presented.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

In this chapter the overall concept and view of determinants of financial performance streamlined by making comprehensive review of relevant literature related to this study which would enable us to know the comparative strength and weakness of the chosen banks and the opportunities and threats they possess in the dynamic environment.

#### **2.2 Conceptual review**

##### **2.2.1 Concept of risk**

Different investors defined risk as different ways: Risk is defined, as the likelihood that the actual return from an investment is less than the forecast return. Stated differently, it is the variability of return from investment.

Risk is the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility. Risk is an uncertain event or condition that, if it occurs, has an effect on at least one objective. Most people view risk is the manner. In reality, risk occurs when researcher cannot be certain about the outcome of a particularly activity or event. So this is not sure that occur in the future consequently, risk result from the fact that an action such as investing can produce, more than one outcome in future. (Wagner, 2012)

In the basic sense risk is the chance of financial loss. Assets having greater chances of loss are viewed as riskier than these with lesser chance of loss. More formally, the term is used interchangeably with uncertainly to refer the variability of returns associated with a given asset.

##### **2.2.2 Sources of risk**

An investment is commitment of money that is expected to generate additional money. Every investment entails some degree of risk; it requires a person's certain sacrifices for future uncertain benefit.

The primary risk factors that create investment uncertainties are as follows:

### **I. Interest rate risk**

Interest rate risk is defined as the potential variability of return caused by change in market interest rate. In interest rate risk, if market interest rates rise, then investment values and market price is fall and vice-versa. This interest rate risk affects the prices of bonds, stocks, real estate gold, futures contracts and other investments as well.

Asset transformation function is the key functions of financial institution. It involves buying primary securities or assets and issuing secondary securities or liabilities to fund assets purchase. The primary security purchased by financial institutions often has maturity and liquidity characteristics which are different from those of secondary security that financial institutions sell. In mismatching the maturities of assets and liabilities as part of their asset transformation function (Francis, 1995).

### **II. Purchasing power risk**

Purchasing power risk is the variability of return an investor suffers because of inflation. Economists measure the rate of inflation by using a price index. The consumer price index (CPI) is a popular index in the U.S. The percentage change in the CPI is widely followed measure of the rate of inflation.

### **III. Bull-bear market risk**

Bull-Bear market risk arises from the variability of market returns resulting from alternating bull and bear market forces. Market risk is incurred in the trading of assets and liabilities due to changes in market forces like interest rates, exchange rates. Furthermore, market risk is the risk related to uncertainty on the earning on its trading portfolios caused by changes in the market condition. The various market forces make securities price upward and downward. The upward trend of market price (Bull Market) and downward trend of market price (Bear Market) create a long lasting source of investment at risk. (Francis, 1995).

### **IV. Management risk**

Management risk is defined as the variability of return caused by a decision made by a firm's management and board of directors. Furthermore, errors made by business manager can harm those who invested in their firms. Forecasting management error is difficult work that may not be worth the effort and, as a result, Agency theory

provides investors with an opportunity to replace skepticism with informed insight as they endeavor to analyze subjective management risk.

#### **V. Default risk**

Default risk is that portion of an investment's total risk that results from changes in the financial integrity of the investment. For example, when a company that issues securities either further away from bankruptcy or closer to it, the changes in the firm's financial integrity is reflected in the market prices of its securities. The variability of return that investors experience as a result of changes in the creditworthiness of a firm in which they invested is their default risk. Default risk is the probability that the borrower is unable to fulfill the term promised under the loan agreement. It is that portion of investment's total risks that result from changes in the financial integrity of the investment (Francis, 1995).

#### **VI. Liquidity risk**

Liquidity risk is sudden surges in liability withdrawal may leave a financial institution in a position of having to liquidate assets in a very short period of time and at low prices. Liquidity risk arises when its liability holders such as depositor or insurance policy maker etc demand immediate cash for the financial claim they hold with financial institution or when holders of loan commitment or credit line suddenly exercise their right to borrow or draw down their right of loan commitments that situation financial institutions must either borrow additional funds or sell assets to meet the demands for the withdrawal of funds (Francis, 1995).

#### **VII. Callability risk**

Some bonds and preferred stocks are issued with a provision that allows the issuer to call them in for repurchase. Issuer like the call provision because it allows them to buy back outstanding preferred stock and/or bond with funds from a newer issue if market interest rate drops below the level being paid on the outstanding securities. There is a chance of creating call-ability risk (Francis, 1995).

#### **VIII. Convertibility risk**

Callability risk and convertibility risks are in two aspects. First both are contractual stipulations that included in the terms of original security issue. Second, both of these provisions affect the variability of return from the affected security. Convertibility risk is that portion of the variability of return from a convertible that the investment may

be converted into the issuer's common stocks at a time or under terms to the investor's best interest (Francis, 1995).

### **IX. Political risk**

Political risk arises from the exploitation of a politically weak group for the benefits of politically strong group, with the efforts of various groups to improve their relative positions increasing the variability return from the affected assets. Regardless of whether the changes that cause political or by economic interests, the resulting variability of return is called political risk (Francis, 1995).

### **X. Industry risk**

An industry may be viewed as a group of companies that compete with each other to market homogeneous products. Industry risk is that portion of risk that can be an investment variability of return caused by events that affects the product and firms that make up an industry (Francis, 1995).

#### **2.2.3 Total risk**

The sources of risk that are reviewed above are the major sources of investment risk, but by no means do they make up an exhaustive if all the uncertainties or sources of risk are added together, it gives the total risk or total variability of return. “Risk Management Practices: Evidences from Commercial Banks of Nepal” with the study is based on questionnaire survey of 120 banking officials from 20 different banks. The empirical evidences have suggested that Nepalese banks regard credit risk as the major source of risk followed by operational risk and interest rate risk, respectively. Inspection by risk manager, financial statement analysis, audit or physical survey and risk survey respectively are four major risk identification methods. In addition, the study has revealed that the six explanatory variables in understanding of risk and its management i.e., board and senior management’s oversight, credit risk management practices, risk identification, risk assessment and measurement, risk monitoring and ownership structure do have the significant relationship with the risk management practices. (Subedi, 2018).

Total risk is an assessment that identifies all of the risk factors associated with pursuing a specific course of action. Total risk represents a combination of the systemic risk and unsystematic risk, including potential internal and external threats and liabilities, Identifying these risks requires performing a total risk

assessment, which offers a comprehensive view of potential threats an organization might encounter. The goal of examining total risk is to make a decision that leads to the best possible outcome. From a compliance perspective, total risk determines an organization's approach to security planning and spending, and regulatory compliance (Sales, 2021).

#### **2.2.4 Types of risk**

There are two types of risk in securities market

I. Systematic Risk

II. Unsystematic Risk

##### **Systematic risk**

Systematic risk is that part of total risk, which is caused by market factors such as inflation, interest rate change, changes of investors expectation about the economic performance etc. The systematic risk is that portion of total variability of return caused by market factors that simultaneously affect the prices of all securities. Such risk are market factors related in order word, it arises from the changes in the economy and market condition for example high inflation, recession, and impact of political factors, which are beyond the control of company management. It affects all firms in the market. The systematic nature of price changes makes them immune so much of the risk reduction effects of diversification. Thus, such systematic risk is also called as undiversifiable risk. The systematic risk is rewarded in the form of risk premium. Sometimes systematic risk is called market risk. Systematic risk affects almost all assets in the economy, at least to some degree, whereas systematic risk affects at most a small number of assets. The principle of diversification has an important implication to diversified investor, only systematic risk matter. It follows that in deciding whether or not to buy a particular individual asset, a diversified investor only concerned with that assets systematic risk. This is a key observation and it allows us to say great deal about the risks and returns on individual assets. Some of the sources of systematic risk include:

1. Interest rate changes
2. Changes in purchasing power
3. Changes in investor's expectation about the overall performance of the economy.

Because diversification cannot eliminate systematic risk, this type of risk is the predominant determinant of the individual security risk premium. This risk is also called beta risk (Weston and Brigham, 1982).

## **II. Unsystematic risk**

Unsystematic risk is one that affects a single asset or a small group of assets. Such risk is caused by factors specific to a particular firm. The unsystematic is that portion of total risk which is unique to the firm that issued the securities. They are non-market factors related. In other word, it arises from the project or firm's specific factors such as efficiencies of management, failure in new product production, employee or labor strikes, lawsuits, advertising campaigns, shift in consumer taste and any other event that is unique to the company. It is inherent individual company or projects. They cause unsystematic variability in the market value of the assets. Since unsystematic risk affect one firm or at most a few firms, they must be forecasted separately for each firm and for each individual incident. Unsystematic security price movements are statistically independent for each other, and so they may be averaged to zero when different assets are combined to form a diversified portfolio. Therefore, such unsystematic risk is also called as diversifiable risk. It is the variability in the security's return caused by such factors as:

1. Management capability and decisions
  2. The availability of the raw materials
  3. The unique effects of government regulations such as pollution control
  4. The effect of foreign competition
  5. The particular levels of financial and operating leverage of the firm employees
- (Weston and Brigham, 1982)

### **2.2.5 Financial risk**

Entrepreneurial activities and risk-taking are inextricably linked to each other. Risk-taking is an essential component of doing business considering basically every entrepreneurial activity is exposed to a greater or lesser degree of uncertainty. One can think of risk as the uncertainty about the future demand for products and services, changes in the business environment and competition and production technologies. In addition to these general business risks, there also exist risks that are caused by the



capital structure of a company such as market risks, credit risks, operational risks and liquidity risks.

Risk is discussed in the context of banks and other financial institutions. Following the regulatory approach in the global banking industry, the three major risk categories are market risk, credit risk as well as operational risk. Nevertheless, they do not form an exhaustive list of possible risks affecting a financial institution, as various other risks such as reputation risk, strategic risk, liquidity risk and model risk may occur. Particularly, the latter two (i.e. liquidity risk and model risk) have received a lot of attention recently and briefly discussed as well.

### **2.2.6 Market risk**

According to McNeil, Frey and Embrechts (2005) the best known type of risk in banking is market risk, which is the risk of change in the value of a financial security (e.g. a derivative instrument) due to changes in the value of their underlying, such as stock prices, bond prices, exchange rates and commodity prices. In other words, it is risk that changes in financial market prices and rates, which reduced the value of a security or a portfolio. Market risk usually arises from both unhedged positions as well as imperfect hedged. Crouhy, (2005) distinguish four major types of market risks, Interest-Rate Risk is caused by changes in the market interest rate. Usually the value of fixed-income securities such as bonds is highly dependent on those interest rates. For instance, when market interest rates raise, the value of owning an instrument offering fixed interests payments falls. Moreover, Hull (2007) emphasizes that managing interest-rate risk is more complex than managing the risk arising from other market variables such as equity prices, exchange rates and commodity prices. On account of the many different interest rates in a given currency, e.g. treasury rates, interbank borrowing and lending rates, mortgage rates etc. These tend to move together, but are normally not perfectly correlated. Furthermore, the term structure is only known with certainty for a few specific maturity dates, while the other maturities must be calculated by interpolation.

Equity-Price Risk is associated with the volatility of stock prices. The general market risk of equity refers to the sensitivity of the value of a security to change in the market portfolio. According to the portfolio theory, the market risk, i.e. the systematic risk, cannot be eliminated through portfolio diversification, whereas the unsystematic risk can be completely diversified away.

Foreign-Exchange Risk arises from open or imperfectly hedged positions in a particular foreign currency. These positions may arise due to natural consequences of business operations such as cross-border investments. The major drivers of foreign-exchange risk are imperfect correlations in the movement of currency prices and fluctuations in international interest rates. Therefore, one of the major risk factors large multinational corporations are exposed to, are foreign exchange volatilities, which may on the one hand diminish returns from cross-border investments or on the other hand increase them.

Commodity-Price Risk differs considerably from interest-rate and foreign-exchange risk, as commodities are usually traded in markets where the supply of most commodities lies in the hands of a just few market participants, which may result in liquidity issues often followed by exacerbating high levels of price volatility. Moreover, storage costs heavily affect commodity prices which vary considerably across commodity markets (e.g. from gold, to electricity, to wheat) on the one hand and on the other hand the benefit of having a certain commodity on stock provides a convenience yield.

### **2.2.7 Credit risk**

Another important risk category is credit risk: The risk that a change in the creditworthiness of counterparty affects the value of a security or a portfolio. Not receiving all promised repayments on outstanding investments such as loans and bonds due to default of the debtor, is the extreme cases. When a company goes bankrupt, the counterparty usually loses the part of the market value that cannot be recovered following the insolvency. The amount expected to be lost is normally called the loss given default whereas the recovery rate is defined as the market value immediately after default (Hull, 2007).

A change in the creditworthiness usually does not imply a default, but rather that the probability of a default increases. A deterioration of the credit rating leads to a loss for the creditor since a higher marked yield is required to compensate for the increased risk which results in a value decline of the debts (e.g. bonds). Crouhy, (2005) stressed that institutions are also exposed to the risk that counterparty might be downgraded by a rating agency. Rating agencies such as Moody's and Standard & Poor (S&P) provide ratings that describe the creditworthiness of corporate bonds and therefore

provide information about default probabilities. If a company is downgraded by a rating agency due to a negative long-term change in the company's creditworthiness, the value of the counterparty's securities diminishes.

### **2.2.8 Operational risk**

A further important risk category recently receiving a lot of attention is operational risk. Operational risk is not only more complex to quantify than market and credit risk but also more difficult to manage as it is a necessary part of doing business. Hull (2007) mentions that there are many different definitions to operational risk and that it is tempting to consider it as a residual risk category, covering any risk faced by a bank that is not either market or credit risk. Nevertheless, this definition of operational risk might be too broad. To define it straightforward, as its name implies, it is the risk arising from operations. Thus, the risk relates to potential losses resulting from inadequate systems, management failures, faulty controls, frauds, and human errors.

According to the Basel Committee on Banking Supervision (2004) operational risk is defined "as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events". Apparently the regulator includes, besides the impact of internal risks, the impact of external risks such as natural disasters (e.g. earthquakes and fires).

Operational risk is not independent from other financial risks. Operational risk losses are for instance frequently contingent on market movements, which enhance the complexity of their classification. One can relate it to a trader taking huge risk in order to receive a tremendous bonus at the end of the year. If – as a result of adverse market movements – the bank suffers huge losses, the risk that led to it can be classified as either operational or market risk, depending on whether the trader was allowed to take that much risk or not.

### **2.2.9 Model risk and liquidity risk**

While banks have always been exposed to threats such as bank robberies and white-collar frauds, one of today's most serious threats is caused by the valuation of complex derivative products, which has come to be known as model risk. Since Black, Scholes and Merton in 1973 published their famous option-pricing model, there has been a tremendous increase in the complexity of valuation theories. These models allow for a pricing of a huge number of financial innovations such as caps,

floors, credit derivatives, and other exotic products. As a negative side effect to the rise in complexity of financial products, the accompanying model risk has increased as well. For instance, Derman, (2004) emphasizes in his book “My Life as a Quant” that this increase was essentially caused by the nature of the models used in finance. In principle, most of these applied models, including the Black-Scholes option-pricing model, have been derived from models encountered in physics. While models of physics are highly accurate, models of finance describe the behavior of market variables which in turn unlike in physics depend on the actions of human beings. Therefore, the models are at best approximate descriptions of the market variables. As a result the use of such models in finance is always accompanied – to a greater or lesser extent – by model risk.

Hull (2007) mentioned two main types of model risk. The first type concerns the risk that a valuation model could provide wrong prices, which can lead to an investor to buy or sell a product at a price that is either too high or too low. The second type relates to models that are used to assess risk exposure and to derive an appropriate hedging strategy in order to mitigate losses. For instance, a company may use a wrong or inadequate model to hedge its positions against an adverse movement of the underlying assets. It, however, is important to bear in mind that a theoretical valuation model is only essential for pricing products that are relatively or even completely illiquid. If there is an active market for a product, market prices are usually the best indicator of an asset’s value and therefore pricing models only play a minor role.

The risk that a firm does not have enough cash and cash equivalents in order to meet its financial obligations as well as the risk of not having enough buyers or sellers on the market is known as liquidity risk. Crouhy (2005), distinguished two dimensions of liquidity risk, namely funding liquidity risk and asset liquidity risk. Funding liquidity risk relates to a firm’s ability to raise the required cash to meet its liabilities. Asset liquidity risk, on the other hand, arises if an institution cannot execute a transaction at the prevailing market price due respectively to a lack of supply and demand.

### **Management of risk**

Risk management is a widely recognized discipline or practice that can be applied across many business boundaries. It is beyond dispute that the future cannot be exactly predicted, as it is always uncertain to a certain degree. However, the risk that is caused by this uncertainty can be managed. Risk management is therefore how financial institutions actively select the overall level of risk that, given their risk taking ability, is optimal for them. Yet it is important to note that risk management also encompasses the duality of the term risk, as risk management is not only about risk reduction. Risk Management requires having practices in place to identify and then monitor risks; convenient access to dependable, current information about risk; the correct balance of control in place to deal with the risks; and decision-making processes that are supported by a framework of risk analysis and evaluation.

Subedi (2018) The three major types of risk faced by commercial banks of Nepal are credit risk, operational risk and interest rate. Inspection by the banks' risk manager, financial statement analysis, audits or physical inspection, and risk survey are the major methods of risk identification. Overall risk management practice seems satisfactory. All the banks have taken risk management as one of the major functions. This signifies that they have viewed risk management practices as core part of management of the bank. Neil (2005), a bank's attitude to risk is rather active than defensive, as banker actively and willingly take on risk in order to benefit from return opportunities. Risk management can therefore be seen as the core competence of a bank. Bankers are using their expertise, market position and capital structure to manage risks by restructuring and transferring them to various market participants. Crouhy (2005), on one hand refers risk management to be widely acknowledged as one of the most creative forces in the world's financial markets. An example, is the rapid development of the huge market for credit derivatives, which emphasize the dispersion of risk (i.e. the credit risk exposure) of an institution to those who are willing, and presumably able, to bear it.

On the other hand, Crouhy (2005), mention extraordinary failures in risk management such as Long-Term Capital Management and the string of financial scandals associated with the millennial boom in equity and technology markets (e.g. Enron and

WorldCom). These are only a few examples of where risk management has not been able to prevent market disruptions and business accounting scandals. Today's risk management has changed compared to traditional risk management, which was basically identifying, measuring, managing, and minimizing risk. The role of today's risk management has changed from minimizing risk to efficient capital allocation and become more important, as it can increase business profitability by allocating capital and the entrepreneurial attention on the areas with the highest risk and return ratio.

### **Risk management process**

Risk Management is a discipline at the core of every bank and encompasses all activities that affect its risk profile. It involves identification, measurement, monitoring and controlling risks to ensure that:

1. The individuals who take or manage risks clearly understand it.
2. The organization's Risk exposure is within the limits established by Board of Directors.
3. Risk taking Decisions are in line with the business strategy and objectives set by Board of Directors.
4. The expected payoffs compensate for the risks taken.
5. Risk taking decisions are explicit and clear.
6. Sufficient capital as a buffer is available to take risk.

Each situation is unique, in terms of roles and capabilities of individuals and the structure, activities and objectives of the bank. Risk management practices considered suitable for one bank may be unsatisfactory for another. Because of the vast diversity in risk that banks take, there is no single prescribed risk management system that works for all. Moreover, in the context of a particular bank, the definition of a sound or adequate risk management system is ever changing, as new technology accommodates innovation and better information and as market efficiency grows. Each bank should tailor its risk management program to its needs and circumstances. To remain competitive, banks must adapt and constantly improve their process.

A sound risk management system should have the following elements:

1. Active board and senior management oversight
2. Adequate policies, procedures and limits

3. Adequate risk measurement, monitoring and management information system;  
and
4. Comprehensive internal controls.

It should not be understood that risk management is only limited to the individual(s), who are responsible for overall risk management function. Business lines are equally responsible for the risks they are taking. Because the line personnel can understand the risks of their activities and any lack of accountability on their part may hinder the sound and effective risk management.

### **Risk measurement**

A central issue in modern risk management is measuring and quantifying risk. To set risk limits as well as determining adequate risk capital as a cushion a financial institution requires against unexpected future losses, belong to the most important functions of risk measurement. Various methods exist to measure these risks, all with the target of capturing the variation of a company's performance. Bessis (2002) distinguishes three categories of risk measures.

Volatility captures the standard deviation of a target variable around its mean. The standard deviation is the square root of the average squared deviation of a target variable from its expected value. Since volatility captures both upside and downside variations, it is a symmetric risk measure which assigns the same amount of risk to deviations above and below the mean. Therefore, volatility lacks in providing a complete picture of risk in the case the target variable has an asymmetric distribution.

Sensitivity captures the deviation of a target variable due to a movement of a single underlying parameter. Sensitivities are normally market risk related as they relate value changes to market parameters such as interest-rate risk. Among all sensitivity measures, the most famous ones are the Duration for bond portfolios and the Greeks for portfolios of derivative instruments. Even though these measures provide useful information regarding the robustness of a portfolio with respect to certain events, they fail to quantify the overall riskiness of a position. Furthermore, they cause problems when risks need to be aggregated (Neil, 2005).

Downside Risk Measures are – unlike the volatility – asymmetric risk measures which focus on adverse deviations of a target variable only. The lower partial moments

(LPMs) of order and the quantile-risk measures such as the Value-at-Risk and the expected shortfall (ES) are the most widely used downside risk measures, Value-at-Risk being the most prominent one.

These downside risk measures focus exclusively on extreme downside moves of the risk factors, rather than considering both upside gains and downside losses. This makes downside risk measures intuitively the most reasonable risk measure, as they are consistent with the human natural asymmetric perception of risk. Measures based on the concept of downside risk are useful in particular when the target variable has a highly skewed distribution, given that skewed distributions need more than the first two statistic moments to be adequately specified. However, if the distribution of a variable is symmetric and not asymmetric, downside risk measures do not provide a more comprehensive picture than the symmetric volatility measure. Unfortunately, the calculation of most downside risk measures is fairly complex, especially when considering derivative financial products with asymmetric payoffs. Already Markowitz (1959) recognized the limitations of the mean-variance approach and suggested to use downside risk measures rather than the volatility measure. Recent risk management literature has focused on downside risk measures such as the Value-at-Risk, whereas average risk measures, in particular the volatility measure, play a minor role (Martellini, and et. Al., 2003). Intuitively this makes sense, as in risk management it is usually most important to obtain a feeling of what deteriorating a financial situation can become in the case certain risk factors turn out to be adverse.

### **Approaches of risk measurement**

In order to provide a comprehensive overview of this subject, it is useful to refer to a slightly different approach mentioned by Neil et al. (2005), which give an overview of existing techniques to measure risk in financial institutions. Moreover, these approaches are grouped into four different categories:

The Notional-Amount Approach is the oldest approach quantifying the risk of a portfolio of risky assets. The calculation of the risk is fairly simple and the sum up of the notional values is weighted by each security's risk factor class. However, even though this approach seems to be crude, Neil (2005) mention that some "variants of this approach are still in use in the standardized approach of the Basel Committee rules on banking regulation".



Factor-Sensitivity Measures are an approach identical to the risk measure category sensitivity mentioned above. A further explanation is therefore not necessary. Risk Measures Based on a Loss Distribution are the most popular approach, being that most modern risk measures are based on a profit and loss (P&L) distribution. A P&L distribution tries to provide an accurate picture of the existing risk in a portfolio or even of the financial institution's overall position in risky assets. The P&L distribution is the distribution of the change in value. Since the focus is on the probability of the occurrence of large losses or more formal the upper tail of the loss distribution, it is according to Neil et al. (2005) common to drop the P from P&L and to simply use the term loss distribution. Both variance and Value-at-Risk are based on such a loss distribution and accordingly rely on historic data.

Scenario-Based Risk Measures are a rather new approach to measure the risk of a portfolio, even though it actually pre-dates Value-at-Risk modeling approach. As a matter of fact, the first commercial application of scenario stress testing was already established in the 1980s with the Chicago Mercantile Exchange to determine its margin requirements. The risk of a portfolio is measured by considering possible future scenarios (i.e. risk-factor changes) such as a rise in the exchange rate and a simultaneous drop in an underlying stock. The total portfolio risk is then defined as the maximum loss of the portfolio taking all scenarios into consideration. This corresponds more or less to a sensitivity analysis that examines the loss profile of a portfolio, by considering a number of changes in certain risk factors. Given the tremendous number of possible historical and hypothetical scenarios, it is important to distinguish between the major risks drivers of a portfolio and the minor ones. Commonly, these major risk factors are based on the market risk since these risk factors are relatively easy to obtain, especially as compared with credit risk and operational risk.

Today, loss distributions are the most popular approach to quantify risk. Yet, when working with loss distributions, two major problems emerge. First, loss distributions are based on historical asset returns. This historical data might be of limited use in predicting future risks. Second, it is difficult to accurately estimate loss distributions; in particular for large portfolios whereas their calculation becomes extremely complex. Nevertheless, these issues are according to Neil (2005) not arguments against the use of loss distributions. Rather, it is important to improve the way these

loss distributions are estimated and to use more caution when applying risk measures based on loss distributions.

### **Return**

Return is the reward for uncertainty or risk. The concept of return has different meaning to different investors. The rate of return from capital investment is a concept that has different meaning to different investors. Some competitors seek near term cash inflow and give less value to more distant returns. Return can be expressed by cash dividend or capital gain or loss. Still some investors measure return using financial ratios.

Return shows financial position of any organization. The company position may be better if it has high return. Return is the reward for an investor from his/her investment. Investors want to maximize expected return subject to their tolerance for risk. Return is the motivating force and it is the key method available to investors in comparing alternative investments. Realized return and expected return are two terms, which are often used, is the language of investment. Realized return is after the fact return, return that was earned or it is history. The Return on Common Stock

Different investor has different meaning on concept of return. Some investor seek near cash inflows and give less value to more distant return such as investor might purchase the stock of other firm that pays a large cash dividends. Other investors are concerned primarily with growth. They would seek projects that offer the promise of long term, higher than average growth of sales, earning and capital appreciation.

Investors seek the maximization of dividends as well as stock price. Financial management is therefore concerned with the activities of corporation that affect the wellbeing of stockholders. That well being can be partially measured by the dividend received. But a more accurate measure is the market value of stock (Sharpe, 1999). For investors, return is considered as main attraction to invest in risky security as a stock (equity) accepting a varying degree of risk tolerance. "The return from holding an investment over some period says a year is simply and cash payments received due to ownership plus the change in market price divided by the beginning price". Thus the return comes from source, income and price appreciation.

For Common stock, it is defined, one period (single period) return as

$$HPR = \frac{P_1 + D_1 - P_0}{P_0}$$

Where,

R = Annual rate of return

$P_1$  = Price of a stock at time t

$P_0$  = Price of stock at time t-1

$D_1$  = Cash dividend received at time

Above formula can be used to determine both actual one period return (when based on historical figure) as well as expected one period return (when based on expected dividends and prices). The return in the parenthesis is the number of the above equation represents the capital gain or loss during the period.

The simple arithmetic means:

$$\overline{HPR} = \sum_{t=1}^n \frac{HPR_t}{n}$$

The Geometric mean:

$$\overline{HPR} = \sum_{t=1}^n (1 + HPR_t)^{1/n} - 1$$

Where  $HPR_t$  is the individual period return,  $n$  is the number of period and  $\sum$  represents the product (or the result of multiplication) (Cheney and Moses, 1996).

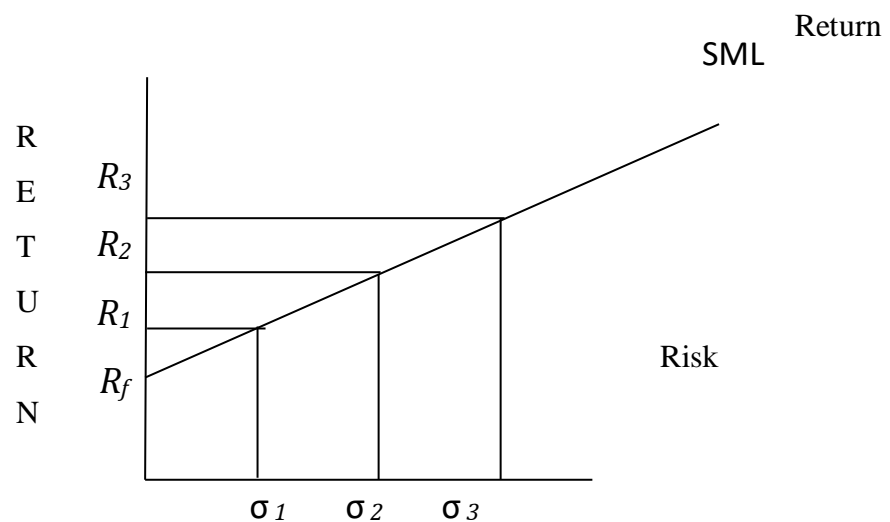
### **Relationship between risk and return**

Investors are generally risk averse. This implies that risky investment must offer higher expected return than less risky investment in order to make the people buy and hold them. The risk aversion attitude of investors portfolio theory was developed and being very important subject in the field of finance. "Any individual investment may differ substantially from the adverse risk and return statistics. That is why it is prudent to investigate any assets before investing.

The relationship between the risk and return is described by investors' perception about risk and their demand for compensation. No investors like to invest in risky assets unless it is assured of adequate compensation for the assumption of risk.

Therefore it is the investor required risk premiums that establish a link between risk and return. In a market dominated by rational investor higher risk is command by rational premium and the tradeoff between the two assumes a linear relationship between risk and risk premium. The observe difference in both the levels and variability of the rates of return across securities are indicative of the underlying risk return relation in the market.

**Figure 2.1**  
**Relationship between risk and return**



The figure represents a higher premium for a higher risk in a linear fashion indicating a premium of  $(R_1 - R_f)$  for  $\sigma_1$  degree of risk  $(R_2 - R_f)$  for  $\sigma_2$  degree of risk and so on. Risk premium is change in increase or decrease in proportion of risk.  $R_f$  stands for return on risk free security. The partial interest is the difference in rates of return across sacrifice, since provide valuable clues to the market's tradeoff between risk and return.

Rational investors would agree that an investment's required return should increase as the risk of investment increase. Most investors would also agree how the expected rate of return should be calculated. But when the discussion turns to risk, the debate begins.

## **Commercial bank**

Commercial banks perform the act of financial intermediation that collect money from the surplus sector in the form of deposits and lend it to various sectors of the economy. As Commercial banks constitute a major chunk of total assets in the banking system in Nepal and extension of credit is one of the major functions of banking institution, the study attempts to capture the determinants of lending behavior of commercial banks. (Timsena, 2017).

### **Product of commercial bank**

#### **1. Accepting deposit**

Oldest or main function of commercial bank is accepting deposits. A bank accepts deposit in three from namely. Saving, current and fixed deposits.

- Current account: The account in which any amount can be deposited and withdrawn at any time is known as current accounts.
- Saving account: The account which is managed to collect the small saving of people is known as saving account. This account can be opened with no menial amount. The main objective of this account is to promote the saving of the people.
- Fixed account: The account which is managed to accept the deposit for fixed period of the providing higher rate of interest is known as fixed deposit account. Amount cannot be withdrawn from bank before the expiry of time. If it is necessary account holder can take loan against the security deposit after paying 2 percent extra interests.

#### **2. Advancing loan**

The second major function of a commercial bank is to provide loans and advance from the money which receives by way of deposit loan, are granted by bank in from of overdrafts, cash credit, direct loans and discounting bill of exchange.

#### **3. Transfer money**

Commercial banks transfer the amount of public and organization from one place to another place or one account to another account with the help of T.T, draft ect.

#### **4. Agency functions**

A bank also performs number of services on behalf of its customer. A commercial bank undertakes the payment of subscription, insurance premium, rent and collection of cheque, bills, salaries, pension and dividend. The commercial banks arrange to remit money from one place to another place by means of cheque, draft, wire transfer and also acts as representative of correspondent for his customers.

#### **5. Exchange foreign currency**

Commercial bank exchange foreign currency on the permission of central bank and considering to the directions provided by central bank. Nowadays commercial bank fixed the rate of foreign currency as per market demand and competition.

#### **6. Helps in issue of capital**

On the request of company, corporation and other organization, it sells shares and debenture, given guarantee and performs agency function for which it takes commission from those organizations against the issue of capital made on behalf of those organizations.

#### **7. Open letter of credit (l.c.)**

It opens L.C. for the import and export (foreign trade) of goods. It has got right to issue and accept traveler`s cheque.

#### **8. Other functions**

It manages locker to keep gold, silver and valuable item safety, collects and publishes the financial information, purchase and sells bill of exchange, provides overdraft facility on the agreement etc.

### **2.3 Empirical review**

Bhattarai (2016) examined the effect of credit risk on performance of Nepalese commercial banks. The descriptive and causal comparative research designs have been adopted for the study. The pooled data of 14 commercial banks for the period 2010 to 2015 have been analyzed using regression model. The regression results revealed that 'non-performing loan ratio' has negative effect on bank performance whereas 'cost per loan assets' has positive effect on bank performance. In addition to credit risk indicators, bank size has positive effect on bank performance. Capital adequacy ratio and cash reserve are not considered as the influencing variables on

bank performance. This study concludes that there is significant relationship between bank performance and credit risk indicators.

Subedi (2018) studied on the title “Risk Management Practices: Evidences From Commercial Banks Of Nepal” on the objectives of analyzing the risk management practices of commercial banks of Nepal. Further, the study has explored the level of understanding on risk and its management along the components of risk management system. The study is based on questionnaire survey of 120 banking officials from 20 different banks. The empirical evidences have suggested that Nepalese banks regard credit risk as the major source of risk followed by operational risk and interest rate risk, respectively. Inspection by risk manager, financial statement analysis, audit or physical survey and risk survey respectively are four major risk identification methods. In addition, the study has revealed that the six explanatory variables in understanding of risk and its management i.e. board and senior management’s oversight, credit risk management practices, risk identification, risk assessment and measurement, risk monitoring and ownership structure do have the significant relationship with the risk management practices.

Serwadda (2018) studied on the title “Impact Of Credit Risk Management Systems On The Financial Performance Of Commercial Banks In Uganda” for the objectives of to analyse the impact of credit risk management on the financial performance of commercial banks in Uganda for a period of 2006 – 2015. Secondary data is sourced from the Bank scope database, African development bank and the central bank of Uganda. The study employs descriptive statistics, regressions and correlation analysis. Regression models are to estimate the magnitude of significance of credit risk management on the performance of commercial banks in Uganda. Banks need to design appropriate credit policies that must handle all necessary conditions before advancing credit to their customers and also develop strong credit administration committees and teams that must conduct appropriate and sound loan appraisal evaluations and which must also monitor the loans throughout the required processes right from extending a loan to a customer up to the completion of loan repayments so as to mitigate credit risks.

Shrestha (2018) investigated on the title of “Effects of Credit Risk on the Financial Performance of Nepalese Commercial Banks” for the objective of this study is to

investigate the impact of credit risk on the performance of Nepalese commercial banks. Among 28 commercial banks in Nepal, two commercial banks, Himalayan Bank Ltd. and Nepal Investment Bank Ltd. with 20 observations. Secondary data are collected for the study from selected banks for the period of 2006 to 2016 which have been used for the analysis. These data are analyzed using regression model. This study focused on the effect of credit risk on the bank performance in the context of Nepal's commercial banks only. It tries to minimize the research gap by emphasizing the effects of credit risk on the financial performance of Nepalese commercial banks. Cash Reserve Ratio and Book Value per Share have a positive and statistically significant impact on bank performance. Capital Adequacy Ratio is not considered as the influencing variable on bank performance. This study concludes that there exists significant relationship between bank performance and credit risk indicators.

Shah (2019) examined on the title "Credit Risk Management of Commercial Banks in Nepal". The study is primarily focused on credit risk assessment practices in commercial banks on the basis of their internal efficiency, assessment of assets and borrower. The model of the study is based on the analysis of relationship between credit risk management practices, credit risk mitigation measures and obstacles and loan repayment. Based on a descriptive research approach the study has used survey-based primary data and performed a correlation analysis on them. It discovered that credit risk management practices and credit risk mitigation measures have a positive relationship with loan repayment, while obstacles faced by borrowers have no significant relationship with loan repayment. The study findings can provide good insights to commercial bank managers in analysing their model of credit risk management system, policies and practices, and in establishing a profitable and sustainable model for credit risk assessment, by setting a risk tolerance level and managing credit risks vis-a-vis the prevailing market competition.

Ndzila and Nelson (2020) investigated on the title "The Impact of Credit Risk Management on the Profitability of a Commercial Bank: The Case of BGFI Bank Congo". For the purpose of identifying credit risk indicators and profitability measurement ratios over the period of 2010-2019. The results of this study examined the impact of credit risk management on the profitability of BGFI Bank Congo, the results indicate that profitability is somewhat affected by credit risk management as measured by its credit risk management indicators. The non-performing loan ratio



(NPLR), the capital assets ratio (CAR), and the loan loss provision ratio (LLPR) show a negative impact on ROE. These three ratios contribute negatively, while the CAR makes a positive contribution to Return on assets (ROA) and the ratio of client loans and short-term financing (RCLSTF) on return on equity (ROE). Thus, credit risk management has a significant impact on profitability. Thus, credit risk management has a significant impact on profitability. The study also shows that other selected credit risk management indicators have a significant impact on the Bank's profitability, such as the loan provision ratio (LLPR) and the clean capital adequacy ratio.

Pradhan and Shah (2020) studied on the title “Credit Risk Management of Commercial Banks in Nepal” with the objectives of credit risk assessment practices in commercial banks on the basis of their internal efficiency, assessment of assets and borrower. The model of the study is based on the analysis of relationship between credit risk management practices, credit risk mitigation measures and obstacles and loan repayment. Based on a descriptive research approach the study has used survey-based primary data and performed a correlation analysis on them. It discovered that credit risk management practices and credit risk mitigation measures have a positive relationship with loan repayment, while obstacles faced by borrowers have no significant relationship with loan repayment. The study findings can provide good insights to commercial bank managers in analyzing their model of credit risk management system, policies and practices, and in establishing a profitable and sustainable model for credit risk assessment, by setting a risk tolerance level and managing credit risks vis-a-vis the prevailing market competition.

Munangi and Sibindi (2020) investigated on the title of “An Empirical Analysis of The Impact of Credit Risk on The Financial Performance Of South African Banks”. this article researcher examines the impact of credit risk on the financial performance of 18 South African banks for the period 2008 to 2018. Panel data techniques, namely the pooled ordinary least squares (pooled OLS), fixed effects and random effects estimators were employed to test the relationship between credit risk and financial performance (proxied by non-performing loans (NPLs) and by return on assets (ROA) or return on equity (ROE) respectively). The results of the study documented that credit risk was negatively related to financial performance. Thus, the higher the incidence of non-performing loans, the lower the profitability of the bank. Secondly,

the study documented that growth had a positive effect on financial performance. This indicates that productivity capacity is ameliorated through bank development. Thirdly, it was found that capital adequacy was positively related to financial performance. the study found that bank leverage and financial performance were negatively related. The implications of the findings are that at a micro-level, banks should observe prudent and stringent credit policies in-order to limit the incidence of non-performing loans. At a macro-level, regulators must enhance supervision in order to ensure that banks manage their credit risk according to the regulations thereby minimising the risk of bank failure.

Chiomal and et al. (2020) studied on the title of “Effect Of Credit And Operational Risk Management On Firm Value Of Deposit Money Banks In Nigeria”. The study investigated the effect of credit and operational risks on firm value of listed deposit banks in Nigeria. The study adopted an ex-post facto research design. The target population of the study was all the deposit money banks listed in Nigeria Stock Exchange. The study used secondary sources of data from Central Bank of Nigeria as well as from annual reports and financial statement of accounts of deposit money banks under review from 2010-2019. The Structural Equation Modeling was used to test the formulated hypotheses at 5% level of significance. The findings showed that credit risk had a significant but negative effect on firm value of deposit money banks in Nigeria. Operational risk had a significant and positive effect on firm value of deposit money banks in Nigeria. The study recommends that banks should ensure that their credit exposures are adequately secured through proper scrutiny of loan processing in order to identify viable projects so as to reduce loan defaults by bank customers. They should continue to employ qualified and competent workers who are experts in banking professionalism as well as ICT competence in order to reduce unsound banking practices.

Alshatti (2020) analyzed on the title “The effect of credit risk management on financial performance of the Jordanian commercial banks”. This research aims at examining the effect of credit risk management on financial performance of the Jordanian commercial banks. during the period (2005-2013), thirteen commercial banks have been chosen to express on the whole Jordanian commercial banks. Two mathematical models have been designed to measure this relationship, the research revealed that the credit risk management effects on financial performance of the

Jordanian commercial banks as measured by ROA and ROE. the researcher recommends banks to improve their credit risk management to achieve more profits, in that banks should take into consideration, the indicators of Non-performing loans/Gross loans, Provision for facilities loss/Net facilities and the leverage ratio that were found significant in determining credit risk management. Also, banks should establish adequate credit risk management policies by imposing strict credit estimation before granting loans to customers, and banks in designing an effective credit risk management system, need to establish a suitable credit risk environment; operating under a sound credit granting process, maintaining an appropriate credit administration that involves monitoring, processing as well as enough controls over credit risk, and banks.

Poudel (2020) examined on the title of “The impact of credit risk management on financial performance of commercial banks in Nepal”. This study try to explore various parameters pertinent to credit risk management as it affect banks’ financial performance. Such parameters covered in the study were; default rate, cost per loan assets and capital adequacy ratio. Financial report of 31 banks were used to analyze for eleven years (2001-2011) comparing the profitability ratio to default rate, cost of per loan assets and capital adequacy ratio which was presented in descriptive, correlation and regression was used to analyze the data. The study revealed that all these parameters have an inverse impact on banks’ financial performance; however, the default rate is the most predictor of bank financial performance. The recommendation is to advice banks to design and formulate strategies that is not only minimize the exposure of the banks to credit risk but it enhances profitability.

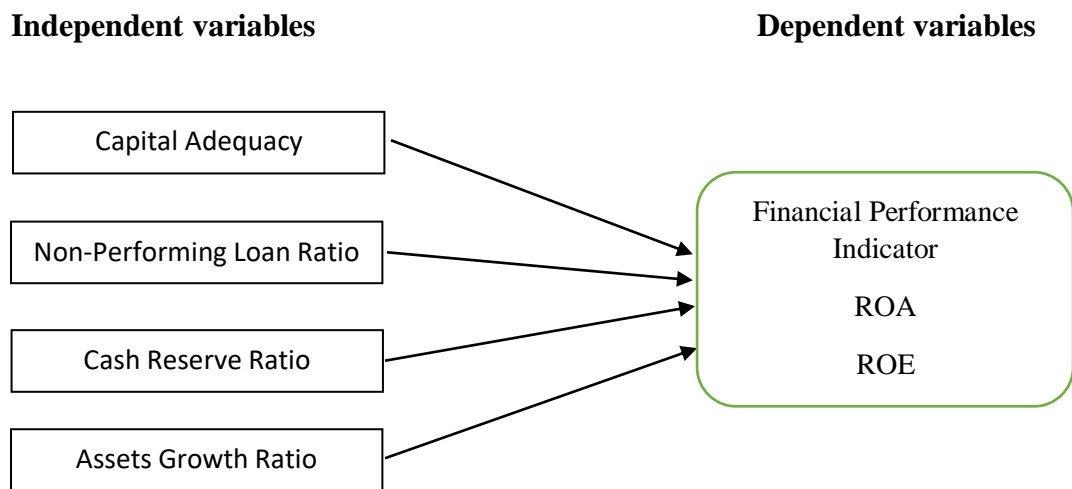
Gauchan and Upadhyaya (2020) studied on the title of “Credit Portfolio Management and Profitability of Joint Venture Commercial Banks of Nepal”. The paper shows the evidence of credit portfolio management and its relationship with banks’ financial performance. Monthly financial report of 7 joint venture commercial banks were used to analyze by comparing sector-wise portfolio management of bank's loan and its relationship with return on assets. Descriptive and fixed effect regression was used to analyze the panel data. It reveals that all the sectors have an impact on banks’ financial performance except consumption & others. The study concludes that the JVBs of Nepal have managed their portfolio as per the standard parameter allocated by Nepal Rastra Bank (NRB) directives. The highest portion of loan in JVBs is

invested in service sector and lowest in agriculture & mining sector. Similarly, the profitability of bank has positive relation to all the sector except consumption & other sector defining the sector-wise portfolio management provides a good framework to maintain the sustainability of bank

Aduda and Obondy (2021) studied on the title “Credit Risk Management and Efficiency of Savings and Credit Cooperative Societies: A Review of Literature” for the objectives to conduct literature review on how credit risk management impacts efficiency and to identify the knowledge gaps in the relationship between the two variables. From the empirical studies reviewed, credit risk management was found to influence financial performance but there is no concrete evidence on the relation that credit risk management has with efficiency of SACCOs. The previous studies have mostly focused on financial performance instead of efficiency and they also differ on the direction of the relationship between the two variables. The difference in findings among the scholars might arise from methodological differences and operationalization of the study variables. Contextual differences might also explain the inconsistent findings as most of the studies have focused on commercial banks and in different economies. Future studies should investigate underlying variables that can explain the relationship between credit risk management and efficiency of SACCOs.

#### **2.4 Conceptual framework**

The conceptual framework describes the relationships among the variables, and the nature and direction of the relationship. Based on the literature review four variables had taken into consideration that had influenced the credit risk management analysis. The dependent and independent variables are as follows:

**Figure 2.2***Conceptual framework**Source: Poudel (2017)***Introduction of variables****a. Capital Adequacy**

Capital Adequacy Ratio is also known as Capital to Risk Assets Ratio, is the ratio of a bank's capital to its risk. National regulators track a bank's CAR to ensure that it can absorb a reasonable amount of loss and complies with statutory Capital requirements. It is a measure of a bank's capital.

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

**b. Non-performing Loan Ratio**

Non-performing loan ratio reflects the bank's credit quality and is considered as an indicator of credit risk management. NPLR, in particular, indicates how bank manage their credit risk because it defines the proportion of loan losses amount in relation to total loan amount. NPLR has been used as the default rate on total loan and advances. It is the major indicator of commercial banks credit risk. It is expected that negative relationship could be expected between non-performing loan ratio and profitability of commercial banks.

$$\text{Non-performing loan ratio} = \frac{\text{Non-performing loan}}{\text{Total loan}}$$

### **c. Cash Reserve Ratio**

Cash reserve ratio is one of the control variables used in analyzing the effect of credit risk on the performance of banks. Traditionally, cash reserve ratio (CRR) has been one of the monetary tools in the hands of the central bank. Cash reserve ratio is a specified minimum fraction of the total deposits of customers which commercial banks have to hold as reserves with the central bank. By changing CRR, the central bank can control the amount of liquidity. If the reserve requirement is raised, banks has less money to loan out and this effectively reduces the amount of capital in the economy, therefore lowering the money supply. It means less money for investment and spending, and would stunt the growth of the economy. It would also mean that banks earn less interest and expect that their profitability may decline. Moreover, cash reserve requirement does not earn any income for the commercial banks and thus, may be viewed as a drain on the profitability of banks.

### **d. Assets Growth Ratio**

Assets growth ratio as measured by total assets is one of the control variables used in analyzing performance of the bank system (Smirlock, 1985). Assets growth ratio is generally used to capture potential economies or diseconomies of scale in banking sector. This variable controls for cost differences in product and risk diversification according to the assets growth ratio of the financial institution. This is included to control for the possibility that large banks are likely to have greater product and loan diversification. In most finance literature, natural logarithm of total assets of the banks is used as a proxy for assets growth ratio.

$$\text{Assets growth ratio} = \frac{\text{Current year asset} - \text{Previous year asset}}{\text{Previous year asset}}$$

### **e. Return on Total Asset**

Return on total assets ratio is the proportion of the sum of net income after taxes and interest to the total asset (total investment). It is the rate of return earned by the firm including loan and the total investment. Higher return on total asset ratio possesses higher earning of the business enterprise interns of its total asset. Lower ratio indicates relatively poor financial position based on the rate of return of an enterprise.

In this study, the following formula has been used to measure the return on total assets of the sample public enterprises.

$$\text{Return on total assets} = \frac{\text{Net income after tax}}{\text{Total assets}}$$

### **f. Return on Equity**

Return on equity (ROE) is the amount of income return on equity investors as a percentage of shareholders equity. Return on equity measures the profitability of an enterprise by revealing how much profit the enterprise generates with the money that the shareholders have invested. ROE is expressed as a percentage and calculated as:

Return on equity = Net income / shareholder equity

### **2.5 Research gap**

Research Gap is the difference between previous works done and the present research works. Earlier researcher conducted by many researchers in the similar topic "risk analysis of Nepalese commercial banks" is very useful and appreciated banks, shareholders and the general public. Those dissertations in a great extent have been successful in analyzing the risk analysis of concerned banks. The suggestions and recommendation given by proceeding researchers to improve and strengthen the managerial and financial decision have been really benefited to the relevant banks. Commercial banks invest its deposits in different profitable sectors according to the directives and circulars of the Nepal Rastra Bank and guidelines and policies of the bank. The policy of Nepal Rastra Bank is being changed time to time. So, the updated study over the change of time frame is major concern for the researchers and concerned organization as well. The study is based on the more recent financial data. Bhattarai (2018) studied on comparative analysis of the risk analysis among sample banks. and Shrestaha (2018) have done the comparative study of selected sample banks. Risk analysis is the major function of every bank for evaluating the financial performance. Therefore, it is major concern of stakeholders to know the financial condition of the bank. Sample banks are the leading commercial banks have significant impact for developing the economy of the country. Regression analysis of those also done in this research gap about the in-depth analysis of the risk analysis which is stakeholders. So, this study is fruitful to those interested parties, scholar, student, teacher, stakeholder, civil society, businessman and government for academically as well as policy perspectives.

## CHAPTER 3

### RESEARCH METHODOLOGY

#### 3.1 Introduction

Evaluating the risk analysis of the selected banks in a micro level and to highlight the efforts of the financial decisions at these banks in the economy at the macro level forms the basic objective at this research. This topic presents the short outline of the methods applied in the process of the risk analysis of the Nepalese commercial banks. Research is a systematic method of finding out the solution to a problem whereas research methodology refers to the various sequential steps to adopt by a researcher in studying a problem with certain objective in view.

#### 3.2 Research design

Research design is a plan structure and strategy of investigation conceived so as to obtain answers of question and to control variance. The analysis of this study is based on descriptive research design keeping in mind on the objective of the study, Generally, research design means definite procedure and technique which guide in studying profound ways for research viability. The main objective of the study is analyze the risk analysis of commercial banks, a case study of Nepal Bank Ltd and Everest Bank Limited. It emphasizes on descriptive and analytical study of the collected data of profit and loss account and balance sheet (i.e. financial statement) over a period of time. Information of data of data of a ten-year period collection from the bank is tabulated. Analysis with different statistical and financial tools i.e. mean, standard deviation, correlation and regression analysis are conducted to find out the necessary result.

#### 3.3 Population and sample

The population for this study comprises all the license commercial banks of the country. A list of licensed commercial bank was obtained from NRB (2077) There are altogether 27 commercial banks. In Nepal, out of them, 3 banks selected as sample for the study by using judgmental sampling method. One of them Nepal Bank Limited (NBL) is taken as government bank, Everest Bank Limited (EBL) taken as joint venture bank and Machhapuchhre Bank Limited (MBL) is taken as private sector bank.



Population comprises of the data published by the concerned authority or institution to make the descriptive and analytical study. For the analytical part, sample of data should be taken in to consideration within which the analysis and evaluation is made. For this purpose the study has taken a sample data of recent ten (T) years financial statement.

### **3.4 Sources of data**

The study is based on secondary data. All the data are collected from the respective commercial banks annual reports especially from profit and loss accounts, balance sheet and other publication made by the banks, which are the secondary data. Likewise, some other related information is gathered from related banks and related agencies like Nepal Rastra Bank, Nepal stock exchange limited. Various data and information are also collected from the journals, periodical bulletins, magazines, internet and websites.

### **3.5 Data collection and processing procedures**

Secondary data were collected from annual reports of sample banks, economic survey, published books and articles etc. The collected data were processed in to descriptive paragraphs, time series data table, graphs and diagram depending upon the nature of data.

### **3.6 Data analysis tools and technique**

The gathered information was grouped as per the need of research work in order to meet research purpose. In this study, data were analyzed using following statistical and financial tools and techniques.

#### **a. Financial Analysis**

##### **1. Ratio Analysis**

## b. Statistical Analysis

1. Mean
2. Standard Deviation
3. Coefficient of Correlation
4. Regression Analysis

### **Arithmetic mean**

The mean or average value is a single value within the range of the data that is used to represent all the value in the series. Since an average is somewhere within the range of the data. It is also called a measure of central value. It is calculated by

$$\text{Mean (x)} = \frac{\sum x}{N}$$

Where,

x= Arithmetic mean

$\sum x$  = Sum of value of all times

N= Number of items

### **Standard deviation**

The standard deviation is the measure that is most often used to describe variability in data distribution. It can be thought of as a rough measure of the average amount by which observation deviation on either side of the mean. Denoted by Greek letters (read as sigma), standard deviation is extremely useful for judging the representative of the mean. Standard deviation is calculated as:

$$\text{Standard deviation } \sigma = \sqrt{\sum_{i=1}^N (x - \bar{x})^2}$$

Where,

$\sigma$ = standard deviation

$\sum (x-x)^2$ = sum of squares of the deviation from arithmetic average

N = Number of items

### **Coefficient of variation**

Coefficient of variation is the ratio of standard deviation to the mean for a given sample. The coefficient of variation is mainly used to measure the relative variability of data distribution. It can also be used to measure relative risk.

$$CV = \frac{\sigma}{X} \times 100$$

Where,

CV = coefficient of variation

$\sigma$  = Standard deviation

X = Arithmetic mean

### **Correlation analysis**

Correlation is defined as the relationship or association between at least one dependent variable and one independent variable. If the two variables are so related that the change in the value of one independent variable results the change in the value of dependent variable then they are said to have correlation to each other. For example, an increase in the monthly income results in increase in monthly expenditure. Hence the two variables, income (independent) and expenditure (dependent) are said to be positively correlation.

Thus correlation is a statistical tools, with the help of which it can be determined whether or not two or more variable are correlated and if they are correlated the degree (extent) and direction of correlation is determined. The coefficient of correlation (r) can range between -1 and +1. A positive r indicates that the two variables move in same direction whereas a negative r value indicates that the two variables move in opposite directions. In this study, correlation analysis has been done between Net income and Return on equity, ROA, Loan to deposit, Loan to total assets. The formula used for determining the correlation coefficient between these variables is a following.

$$\text{Correlation coefficient (r)} = \frac{\sum XY - n\bar{X}\bar{Y}}{\sqrt{\sum X^2 - n\bar{X}^2} \sqrt{\sum Y^2 - n\bar{Y}^2}}$$

Where,

n = number of observations in series x and y

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

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

$\sum x^2$  = Sum of squared observation in series x

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

Probable error of correlation coefficient is a measure of testing the reliability of an observed value of correlation coefficient. It is calculated to find the extent to which correlation coefficient is dependable as it depends upon the condition of random sampling.

$$\text{As, P.E}(r) = \frac{\sqrt{(1-r)^2}}{N}$$

Where,

$$r = \text{Standard error, } n = 0.6745$$

Reason for taking 0.6745 is that in a normal distribution 50% of observation lie in the range 0.6745 where,  $\mu$  and  $\sigma$  denote the population mean and standard deviation.  $E(r)$  is used to test if an observed value of sample correlation coefficient is significant of any correlation in the population. If  $r < \text{P.E}$ , correlation is not at all significant, If  $r > \text{P.E}$ ,  $r$  is definitely significant.

### **Multiple regression analysis**

In the statistical modelling, regression analysis is a statistical process for the estimating relationship among variables. It includes many techniques for modelling and analyzing several variables and one or more independent variables regression analysis is a mathematical measure of average relationship between two variables or more variables in terms of original unit of data. The general purpose of multiple regressions is to learn more about the relationship between several independent or predictor variables and a dependent criterion variable. In this study, the dependent variable is ROE and ROA and independent variables are Capital Adequacy Ratio, Non-Performing Loan Ratio, Cash Reserve Ratio and Assets Growth Ratio.

The line of regression is  $Y = a + bx$

Multiple Regression Model

$$\hat{Y}_{ROA} = \alpha + \beta_1 CAR + \beta_2 NPLR + \beta_3 CRR + \beta_4 AGR + \varepsilon \dots \dots \dots (i)$$

$$\hat{Y}_{ROE} = \alpha + \beta_1 CAR + \beta_2 NPLR + \beta_3 CRR + \beta_4 AGR + \varepsilon \dots \dots \dots (ii)$$

Where,  $\hat{Y}$  = regression line (ROA/ROE)

$\alpha$  = Constant

$\beta_1, \beta_2, \beta_3, \beta_4$  = Coefficient

CAR = Capital Adequacy Ratio

NPLR = Non-Performing Loan Ratio

CRR = Cash Reserve Ratio

AGR = Assets Growth Ratio

$\varepsilon$  = Estimation of error term

## **CHAPTER 4**

### **RESULT AND DISCUSSION**

In this chapter, raw form of data which are collected from various sources are processed and changed into an understandable presentation using financial as well as statistical tools as mentioned in the previous chapter. Similarly, the process of transforming of data is called analysis for the examination and interpretation of the data to draw conclusion. Therefore, this chapter is the heart of the study, as all the findings, conclusions and recommendations are going to be derived from the calculations and analysis done in this section. For the purpose of the study ten years data from fiscal year 2010/2011 to 2019/2020 of all sample banks have been taken into consideration. In this chapter descriptive analysis, correlation analysis and regression analysis of secondary data is performed.

#### **4.1 Presentation of data**

Under this analysis, the annual report of EBL, MBL and NBL since 2011 to 2020 and other essential data available from different organization have been presented with the help of table and line diagram.

##### **4.1.1 Descriptive statistics**

The descriptive statistics containing minimum, maximum, mean and standard deviation of the variables from the sampled commercial banks found, presented and analyzed accordingly in this study. The mean value reports the arithmetical average of variables which are included in this study. An average provides a point which is most representatives of the data. The minimum and maximum values indicate the lower and the highest value of the variable. The standard deviation exhibits the diversity or variability in the data set of each variable. A small standard deviation points towards that the data points are inclined to be extremely close to the mean; while high values of standard deviation points that the data set is broaden out over a large range of values. The table indicates the bank's profitability indicators like ROA & ROE. This table shows the relationship between the independent variables like CAR, NPLR, CRR, AGR and individual dependent variable.

**Table 4.1***Descriptive Statistics*

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
ROA	30	0.23%	2.40%	1.42%	0.65%
ROE	30	-58.85%	30.47%	17.61%	10.5%
CAR	30	-11.23%	17.01%	12.09%	3.4%
NPLR	30	0.16%	5.61%	2.03%	1.8%
CRR	30	3.79%	20.61%	11.57%	5.0%
AGR	30	-5.19%	43.09%	17.15%	11.3%

Table 4.1 shows the descriptive analysis of the study. The average ROA is 1.42% with standard deviation or 0.65%. The minimum ROA is 0.23% and maximum is 2.40%. The average ROE is 17.61% and standard deviation is 10.5%. The minimum ROE is -58.85% and maximum is 30.47%. The average value of capital adequacy (CAR) is 12.09% with standard deviation of 3.4%. The minimum capital adequacy ratio is -11.23% and the maximum is 17.01%.

Similarly, the average value of NPLR is 2.03% with standard deviation is 1.8%. The minimum NPLR ratio is 0.16% and maximum is 5.61%. The average CRR is 11.57% with standard deviation 5%. The maximum CRR is 20.61% and minimum is 3.79% and the average value of AGR is 17.15% with standard deviation is 11.3%. The minimum CRR is -5.19% and maximum are 43.09%.

#### **4.1.2 Capital Adequacy**

The capital adequacy ratio (CAR) is a measurement of a bank's available capital expressed as a percentage of a bank's risk-weighted credit exposures. The capital adequacy ratio, also known as capital-to-risk weighted assets ratio (CRAR), is used to protect depositors and promote the stability and efficiency of financial systems around the world. Two types of capital are measured: tier-1 capital, which can absorb losses without a bank being required to cease trading, and tier-2 capital, which can absorb losses in the event of a winding-up and so provides a lesser degree of protection to depositors (Hayes, 2020).

**Table 4.2**  
*Capital Adequacy*

<b>FY</b>	<b>EBL</b>	<b>MBL</b>	<b>NBL</b>
2010/11	10.43%	10.79%	-10.18%
2011/12	11.02%	15.04%	-11.23%
2012/13	11.59%	12.54%	-0.59%
2013/14	11.15%	10.63%	4.55%
2014/15	13.33%	12.24%	8.00%
2015/16	12.66%	12.36%	10.86%
2016/17	14.69%	16.82%	14.47%
2017/18	14.20%	15.36%	11.27%
2018/19	13.74%	12.79%	16.80%
2019/20	13.38%	13.02%	17.01%
<b>Average</b>	<b>12.62%</b>	<b>13.16%</b>	<b>6.09%</b>
<b>S.D.</b>	<b>1.48%</b>	<b>2.00%</b>	<b>10.38%</b>

Source: Appendix I

Table 4.2 shows the capital adequacy ratio of selected sample banks for year 2011 to 2020. The average capital adequacy ratio of MBL is higher among the sample i.e., 13.16% and lower is NBL at 6.09%. The lower SD of among sample bank is EBL and higher SD is NBL which is 1.48% and 10.38% respectively. Higher capital adequacy ratio shows the lower the risks or healthy condition of banks.

#### **4.1.3 Non-Performing Loan Ratio**

A nonperforming asset (NPA) refers to a classification or loans or advances that are in default or in arrears. A loan is in arrears when principal or interest payments are late or missed. A loan is in default when the lender considers the loan agreement to be broken and the debtor is unable to meet his obligations. Nonperforming assets (NPAs) are recorded on a bank's balance sheet after a prolonged period of non-payment by the borrower. NPAs place financial burden on the lender; a significant number of NPAs over a period of time may indicate to regulators that the financial health of the bank. When a lender records a large percentage of its outstanding loans as non-performing loans, it can hurt the financial performance of the lender. Banks mainly make money from the interest they charge on loans, and when they are unable to collect the owed interest payments from NPLs, it means that they have less money available to create new loans and pay operating costs.



**Table 4.3***Non-Performing Loan Ratio*

<b>FY</b>	<b>EBL</b>	<b>MBL</b>	<b>NBL</b>
2010/11	0.35%	4.26%	4.75%
2011/12	0.86%	2.92%	5.61%
2012/13	0.64%	2.90%	4.81%
2013/14	0.99%	1.81%	5.24%
2014/15	0.67%	0.65%	5.04%
2015/16	0.39%	0.55%	3.39%
2016/17	0.26%	0.38%	3.31%
2017/18	0.20%	0.45%	3.06%
2018/19	0.16%	0.39%	3.21%
2019/20	0.22%	0.53%	2.95%
<b>Average</b>	<b>0.47%</b>	<b>1.49%</b>	<b>4.14%</b>
<b>S.D.</b>	<b>0.30%</b>	<b>1.41%</b>	<b>1.04%</b>

Source: Appendix I

Table 4.3 shows the non-performing loan ratio of selected sample banks for year 2011 to 2020. The average non-performing ratio of NBL is higher among the sample i.e., 4.14% and lower is EBL at 0.47%. The lower SD of among sample bank is EBL and higher SD is MBL which is 0.30% and 1.41% respectively. Lower non-performing shows the safe investment of banks.

#### **4.1.4 Cash Reserve Ratio**

the cash reserve Ratio is a particular minimum amount of the total deposits of customer that needs to be maintained by the commercial bank as a reserve either is cash or as deposits with NRB. The CRR rate is fixed as per the guidelines of the Central Bank. The cash flow of the entire economy is constantly worked and monitored by RBI. The Reserve Bank of India has several monetary instruments to control the economy in terms of different aspects. One such monetary tool is the cash reserve ratio or CRR rate. Every commercial bank is mandated by RBI to abide by the specified CRR rules provided to each bank.

**Table 4.4***Cash Reserve Ratio*

<b>FY</b>	<b>EBL</b>	<b>MBL</b>	<b>NBL</b>
2010/11	11.44%	5.91%	19.96%
2011/12	16.32%	13.61%	18.97%
2012/13	14.22%	11.36%	16.53%
2013/14	15.21%	8.61%	4.21%
2014/15	20.61%	9.34%	6.02%
2015/16	14.57%	7.28%	12.21%
2016/17	15.49%	9.53%	10.00%
2017/18	16.40%	9.98%	6.31%
2018/19	17.97%	3.79%	8.68%
2019/20	13.91%	4.37%	4.18%
<b>Average</b>	<b>15.61%</b>	<b>8.38%</b>	<b>10.71%</b>
<b>S.D.</b>	<b>2.48%</b>	<b>3.08%</b>	<b>5.97%</b>

Source: Appendix I

Table 4.4 shows the cash reserve ratio of selected sample banks for year 2011 to 2020. The average cash reserve ratio of EBL is higher among the sample i.e., 15.61% and lower is MBL at 8.38%. The lower SD of among sample bank is EBL and higher SD is NBL which is 2.48% and 5.97% respectively. Higher cash reserve shows the higher liquidity of banks it minimizes the risk of bank.

#### **4.1.5 Assets Growth Ratio**

Assets growth ratio is generally used to capture potential economies or diseconomies of scale in banking sector. This variable controls for cost differences in product and risk diversification according to the assets growth ratio of the financial institution. This is included to control for the possibility that large banks are likely to have greater product and loan diversification. In most finance literature, natural logarithm of total assets of the banks is used as a proxy for assets growth ratio.

**Table 4.5**  
*Assets Growth Ratio*

<b>FY</b>	<b>EBL</b>	<b>MBL</b>	<b>NBL</b>
2010/11	11.73%	-5.19%	-3.07%
2011/12	20.71%	24.23%	18.53%
2012/13	17.79%	24.38%	9.65%
2013/14	7.16%	34.42%	22.71%
2014/15	40.77%	19.72%	4.25%
2015/16	14.84%	21.95%	43.09%
2016/17	2.31%	15.93%	13.74%
2017/18	24.29%	23.01%	8.44%
2018/19	17.45%	24.13%	5.06%
2019/20	8.79%	18.31%	25.37%
<b>Average</b>	<b>16.58%</b>	<b>20.09%</b>	<b>14.78%</b>
<b>S.D.</b>	<b>10.77%</b>	<b>10.16%</b>	<b>13.26%</b>

Source: Appendix I

Table 4.5 shows the assets growth ratio of selected sample banks for year 2011 to 2020. The average assets growth ratio of MBL is higher among the sample i.e., 20.09% and lower is NBL at 14.78%. The lower SD of among sample bank is MBL and higher SD is NBL which is 10.16% and 13.26% respectively. Higher assets growth shows the higher rate of performance of banks.

#### **4.1.6 Return on Assets**

Return on assets (ROA) is an indicator of how profitable a company is relative to its total assets. ROA gives a manager, investor, or analyst an idea as to how efficient a company's management is at using its *assets* to generate earnings. *Return on assets* is displayed as a percentage; the higher the *ROA* the better. Return on Assets (ROA) is an indicator of how well a company utilizes its assets in terms of profitability. ROA is best used when comparing similar companies or by comparing a company to its own previous performance.

**Table 4.6**  
*Return on Assets Ratio*

<b>FY</b>	<b>EBL</b>	<b>MBL</b>	<b>NBL</b>
2010/11	2.01%	0.46%	0.56%
2011/12	1.95%	1.57%	0.23%
2012/13	2.24%	0.49%	0.22%
2013/14	2.20%	1.12%	1.07%
2014/15	1.59%	1.26%	0.97%
2015/16	1.52%	1.51%	0.46%
2016/17	1.72%	1.89%	2.40%
2017/18	1.78%	1.47%	2.39%
2018/19	1.80%	1.61%	2.35%
2019/20	1.36%	1.02%	1.51%
<b>Average</b>	<b>1.82%</b>	<b>1.24%</b>	<b>1.22%</b>
<b>S.D.</b>	<b>0.29%</b>	<b>0.48%</b>	<b>0.89%</b>

Source: Appendix I

Table 4.6 shows the return on assets ratio of selected sample banks for year 2011 to 2020. The average return on assets ratio of EBL is higher among the sample i.e., 1.82% and lower is NBL at 1.22%. The lower SD of among sample bank is EBL and higher SD is NBL which is 0.29% and 0.89% respectively. Higher return on assets shows the higher profitability of banks.

#### **4.1.7 Return on Equity**

Investing in companies that generate profits more efficiently than their rivals can be very profitable for portfolios. Return on equity (ROE) can help investors distinguish between companies that are profit creators and those that are profit burners. On the other hand, ROE might not necessarily tell the whole story about a company and must be used carefully. Here, we dig deeper into return on equity, what it means and how it is used in practice. Return on equity (ROE) is calculated by dividing a company's net income by its shareholders' equity, thereby arriving at a measure of how efficient a company is in generating profits.

**Table 4.7**  
*Return on Equity*

<b>FY</b>	<b>EBL</b>	<b>MBL</b>	<b>NBL</b>
2010/11	29.91%	5.01%	-9.30%
2011/12	26.11%	14.43%	-58.85%
2012/13	30.47%	5.31%	3.82%
2013/14	28.40%	14.05%	19.49%
2014/15	22.85%	15.44%	13.00%
2015/16	20.32%	16.82%	7.07%
2016/17	17.38%	15.03%	23.85%
2017/18	16.00%	12.07%	23.57%
2018/19	17.33%	15.10%	14.03%
2019/20	13.50%	10.92%	8.87%
<b>Average</b>	<b>22.23%</b>	<b>12.42%</b>	<b>4.56%</b>
<b>S.D.</b>	<b>6.21%</b>	<b>4.18%</b>	<b>24.39%</b>

Source: Appendix I

Table 4.7 shows the return on equity ratio of selected sample banks for year 2011 to 2020. The average return on equity ratio of EBL is higher among the sample i.e., 22.23% and lower is NBL at 4.56%. The lower SD of among sample bank is MBL and higher SD is NBL which is 4.18% and 24.39% respectively. Higher return on equity shows the higher profitability of banks.

#### **4.1.8 Correlation coefficient**

The correlation coefficient is a statistical measure of the strength of the relationship between the relative movements of two variables. The values range between -1.0 and 1.0. A correlation of -1.0 shows a perfect negative correlation, while a correlation of 1.0 shows a perfect positive correlation. A positive correlation coefficient indicates that an increase in the first variable would correspond to an increase in the second variable, thus implying a direct relationship between the variables. A negative correlation indicates an inverse relationship whereas one variable increases, the second variable decreases.

**Table 4.8**  
*Correlation Coefficient between ROA and Independent Variables*

		ROA	CAR	NPLR	CRR	AGR
ROA	Pearson Correlation	1	0.499**	-0.550**	-0.061	-0.064
	Sig. (2-tailed)		0.005	0.002	0.75	0.74
	N	30	30	30	30	30
Results			Sig.	Sig.	Insig	Insig

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

The ROA is positively and negatively correlated with the dependent variables. The correlation coefficient between ROA and CAR is positively correlated and NPLR, CRR and AGR Ratio is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROA and Negative correlation shows increase in ratio decreasing the ROA. The p value of CAR and NPLR is significant and CRR and AGR is statically insignificant.

**Table 4.9**  
*Correlation Coefficient between ROE and independent Variables*

		ROE	CAR	NPLR	CRR	AGR
ROE	Pearson Correlation	1	0.025	-0.006	0.338	0.022
	Sig. (2-tailed)		0.89	0.98	0.07	0.91
	N	30	30	30	30	30
Results			Insig	Insig	Sign	Insig

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

The ROE is positively and negatively correlated with the dependent variables. The correlation coefficient between ROE and CAR, CRR and AGR is positively correlated and NPLR is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROE and Negative correlation shows increase in ratio decreasing the ROE. The p value of all dependent variables are statically insignificant except CRR.

#### 4.1.9 Multiple regression analysis

Regression analysis is a set of statistical methods used for the estimation of relationships between a dependent variable and one or more independent variables. It can be utilized to assess the strength of the relationship between variables and for modeling the future relationship between them. Multiple linear regression analysis is

essentially similar to the simple linear model, with the exception that multiple independent variables are used in the model.

### A) Regression Model I

**Table 4.10**

*Model I Regression Coefficient (ROA)*

Model		Unstandardized		Standardized		t	Sig.
		Coefficients		Coefficients			
		B	Std. Error	Beta			
1	(Constant)	0.014	0.006			2.333	0.028
	CAR	0.055	0.034	0.289		1.616	0.019
	NPLR	-0.16	0.064	-0.457		-2.505	0.019
	CRR	-0.012	0.02	-0.091		-0.588	0.062
	AGR	-0.012	0.009	-0.201		-1.28	0.212
R Square= 0.414, Adjusted R square = 0.32, F=4.417, Sign at 0.008							

a. Dependent Variable: ROA

Table 4.10 shows the coefficient of regression model I (ROA and independent variables), the value of R square is 0.414 or 41.4% which shows the variable are contribute to effect on ROA is 41.4%. It indicates that 41.4% of the total variations in average ROA is explained by regression equation and remaining 59.6% is due to the effects of other factor. Value of F is 4.417 and F(sig) is 0.008 so the variable are significantly statistics.

The regression line for ROA, the constant is 0.0014, CAR is 0.055, NPLR is -0.16, CRR is -0.012, and AGR is -0.012 times responsible for the change a point of ROA. Value of P in CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significance and CRR and AGR is insignificant.

The Regression equation is:

$$Y_{ROA} = 0.014 - 0.055 \text{ CAR} - 0.16 \text{ NPLR} - 0.012 \text{ CRR} - 0.012 \text{ AGR}$$

## B) Regression Model II

**Table 4.11**

*Model II Regression Coefficients (ROE)*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	0.05	0.12		0.41	0.69
	CAR	0.24	0.68	0.08	0.35	0.03
	NPLR	0.42	1.28	0.07	0.33	0.04
	CRR	0.73	0.40	0.35	1.84	0.08
	AGR	0.02	0.18	0.03	0.13	0.10
R Square= 0.12, Adjusted R square = 0.02, F=0.852, Sign at 0.506						

a. Dependent Variable: ROE

Table 4.11 shows the coefficient of regression model II (ROE and independent variables), the value of R square is 0.12 or 12% which shows the variable are contribute to effect on ROE is 12%. It indicates that 12% of the total variations in average ROE is explained by regression equation and remaining 88% is due to the effects of other factor. Value of F is 0.825 and F(sig) is 0.506 so the variable are significantly statistics.

The regression line for ROE, the constant is 0.05, CAR is 0.24, NPLR is 0.42, CRR is 0.73, and AGR is 0.02 times responsible for the change a point of ROE. Value of P in CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significant and CRR and AGR is insignificant.

The Regression equation is:

$$Y_{ROE} = 0.05 + 0.24 \text{ CAR} + 0.42 \text{ NPLR} + 0.73 \text{ CRR} + 0.02 \text{ AGR}$$

### 4.2 Major findings

From the above analysis the major findings for the purpose of Credit Risk Analysis of Nepalese Commercial Banks are as follows:

1. The average capital adequacy ratio of MBL is higher among the sample i.e., 13.16% and lower is NBL at 6.09%. The lower SD of among sample bank is EBL and higher SD is NBL which is 1.48% and 10.38% respectively.
2. The average non-performing ratio of NBL is higher among the sample i.e., 4.14% and lower is EBL at 0.47%. The lower SD of among sample bank is



EBL and higher SD is MBL which is 0.30% and 1.41% respectively. Lower non-performing shows the safe investment of banks.

3. The average cash reserve ratio of EBL is higher among the sample i.e., 15.61% and lower is MBL at 8.38%. The lower SD of among sample bank is EBL and higher SD is NBL which is 2.48% and 5.97% respectively. Higher cash reserve shows the higher liquidity of banks.
4. The average assets growth ratio of MBL is higher among the sample i.e., 20.09% and lower is NBL at 14.78%. The lower SD of among sample bank is MBL and higher SD is NBL which is 10.16% and 13.26% respectively. Higher assets growth shows the higher rate of performance of banks.
5. The average return on assets ratio of EBL is higher among the sample i.e., 1.82% and lower is NBL at 1.22%. The lower SD of among sample bank is EBL and higher SD is NBL which is 0.29% and 0.89% respectively. Higher return on assets shows the higher profitability of banks.
6. The average return on equity ratio of EBL is higher among the sample i.e., 22.23% and lower is NBL at 4.56%. The lower SD of among sample bank is MBL and higher SD is NBL which is 4.18% and 24.39% respectively. Higher return on equity shows the higher profitability of banks.
7. The correlation coefficient between ROA and CAR is positively correlated and NPLR, CRR and AGR Ratio is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROA and Negative correlation shows increase in ratio decreasing the ROA. The p value of CAR and NPLR is significant and CRR and AGR is statically insignificant.
8. The correlation coefficient between ROE and CAR, CRR and AGR is positively correlated and NPLR is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROE and Negative correlation shows increase in ratio decreasing the ROE. The p value of all dependent variables are statically significant.
9. The value of R square is 0.414 or 41.4% which shows the variable are contribute to effect on ROA is 41.4%. It indicates that 41.4% of the total variations in average ROA is explained by regression equation and remaining 59.6% is due to the effects of other factor. Value of F is 4.417 and F(sig) is 0.008 so the variable are significantly statistics. The regression line for ROA, the constant is 0.0014, CAR is 0.055, NPLR is -0.16, CRR is -0.012, and AGR

is -0.012 times responsible for the change a point of ROA. Value of P at CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significance and CRR and AGR is insignificant.

10. The value of R square is 0.12 or 12% which shows the variable are contribute to effect on ROA is 12%. It indicates that 12% of the total variations in average ROA is explained by regression equation and remaining 88% is due to the effects of other factor. Value of F is 0.825 and F(sig) is 0.506 so the variable are significantly statistics. The regression line for ROE, the constant is 0.05, CAR is 0.24, NPLR is 0.42, CRR is 0.73, and AGR is 0.02 times responsible for the change a point of ROE. Value of P in CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significant and CRR and AGR is insignificant.

### **4.3 Discussion**

Credit risk analysis can be thought of as an extension of the credit allocation process. After an individual or business applies to a bank or financial institution for a loan, the bank or financial institution analyzes the potential benefits and costs associated with the loan. Credit risk or credit default risk is a type of risk faced by lenders. Credit risk arises because a debtor can always renege on their debt payments. In the lead-up to the 2008 Great Recession, commercial banks, investment banks, and other financial markets participants underestimated both the default probability and the loss rate and consequently underestimated the credit risk they were facing.

The study investigates the credit risk management and profitability of commercial banks of Nepal. The present status of non-performing loans, cash reserve ratio and capital adequacy ratio and assets growth ration in commercial banks. And the relationship between credit risk management and profitability of Nepalese commercial bank. Three banks are taken as sample among the 27 commercial banks of Nepal for the analysis. Financial, Descriptive and inferential analysis with correlation and regression analysis.

The average capital adequacy ratio of MBL is higher than other bank, it shows MBL is maintain adequate capital ratio. The average non-performing ratio of EBL is lower among the sample shows the safe investment of banks. The average cash reserve ratio of EBL is higher among the sample shows the higher liquidity of banks. The average

assets growth ratio of MBL is higher among the shows higher rate of performance of banks. The average return on assets ratio of EBL is higher among the sample shows the performance and profitability of banks. The average return on equity ratio of EBL is higher among the sample shows the higher profitability of banks. The correlation coefficient between ROA and CAR is positively correlated and NPLR, CRR and AGR Ratio is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROA and Negative correlation shows increase in ratio decreasing the ROA. The p value of CAR and NPLR is insignificant and CRR and AGR is statically significant. The correlation coefficient between ROE and CAR, CRR and AGR is positively correlated and NPLR is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROE and Negative correlation shows increase in ratio decreasing the ROE. The p value of all dependent variables are statically significant.

The variable is contribute that 41.4% of the total variations in average ROA is explained by regression equation and remaining 59.6% is due to the effects of other factor. Value of F is 4.417 and F(sig) is 0.008 so the variable are significantly statistics. The regression line for ROA, the constant is 0.0014, CAR is 0.055, NPLR is -0.16, CRR is -0.012, and AGR is -0.012 times responsible for the change a point of ROA. Value of P at CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significance and CRR and AGR is insignificant. The variable are contribute to effect on ROE is 12%. It indicates that 12% of the total variations in average ROA is explained by regression equation and remaining 88% is due to the effects of other factor. Value of F is 0.825 and F(sig) is 0.506 so the variable are significantly statistics. The regression line for ROE, the constant is 0.05, CAR is 0.24, NPLR is 0.42, CRR is 0.73, and AGR is 0.02 times responsible for the change a point of ROE. Value of P in CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significant and CRR and AGR is insignificant.

The above review literature and analysis shows that the studies dealing with the impact of credit risk on the performance of Nepalese commercial banks are of greater significance. Though there are these findings in the context of different countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Hence, this study attempts to analyze the relationship between performance and credit risk in Nepalese commercial banks

## CHAPTER 5

### SUMMARY AND CONCLUSION

#### 5.1 Summary

Credit risk is the possibility of a loss resulting from a borrower's failure to repay a loan or meet contractual obligations. Traditionally, it refers to the risk that a lender may not receive the owed principal and interest, which results in an interruption of cash flows and increased costs for collection. Excess cash flows may be written to provide additional cover for credit risk. When a lender faces heightened credit risk, it can be mitigated via a higher coupon rate, which provides for greater cash flows. Although it's impossible to know exactly who is default on obligations, properly assessing and managing credit risk can lessen the severity of a loss. Interest payments from the borrower or issuer of a debt obligation are a lender's or investor's reward for assuming credit risk (Laberra, 2020).

The main objective of the study is analyze the risk analysis of commercial banks, a case study of Nepal Bank Ltd and Everest Bank Limited. It emphasizes on descriptive and analytical study of the collected data of profit and loss account and balance sheet (i.e. financial statement) over a period of time. Information of data of data of a ten-year period collection from the bank is tabulated. Analysis with different statistical and financial tools has been conducted to find out the necessary result also.

The average capital adequacy ratio of MBL is higher than other bank, it shows MBL is maintain adequate capital ratio. The average non-performing ratio of EBL is lower among the sample shows the safe investment of banks. The average cash reserve ratio of EBL is higher among the sample shows the higher liquidity of banks. The average assets growth ratio of MBL is higher among the shows higher rate of performance of banks. The average return on assets ratio of EBL is higher among the sample shows the performance and profitability of banks. The average return on equity ratio of EBL is higher among the sample shows the higher profitability of banks. The correlation coefficient between ROA and CAR is positively correlated and NPLR, CRR and AGR Ratio is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROA and Negative correlation shows increase in ratio decreasing the

ROA. The p value of CAR and NPLR is insignificant and CRR and AGR is statically significant. The correlation coefficient between ROE and CAR, CRR and AGR is positively correlated and NPLR is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROE and Negative correlation shows increase in ratio decreasing the ROE. The p value of all dependent variables are statically significant.

The variable is contribute that 41.4% of the total variations in average ROA is explained by regression equation and remaining 59.6% is due to the effects of other factor. Value of F is 4.417 and F(sig) is 0.008 so the variable are significantly statistics. The regression line for ROA, the constant is 0.0014, CAR is 0.055, NPLR is -0.16, CRR is -0.012, and AGR is -0.012 times responsible for the change a point of ROA. Value of P at CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significance and CRR and AGR is insignificant. The variable are contribute to effect on ROE is 12%. It indicates that 12% of the total variations in average ROA is explained by regression equation and remaining 88% is due to the effects of other factor. Value of F is 0.825 and F(sig) is 0.506 so the variable are significantly statistics. The regression line for ROE, the constant is 0.05, CAR is 0.24, NPLR is 0.42, CRR is 0.73, and AGR is 0.02 times responsible for the change a point of ROE. Value of P in CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significant and CRR and AGR is insignificant.

The study deals with the impact of credit risk on the performance of Nepalese commercial banks are of greater significance. Though there are these findings in the context of different countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Hence, this study attempts to analyze the relationship between performance and credit risk in Nepalese commercial banks.

## **5.2 Conclusion**

After summarizing the objectives of the study, it is the place where conclusion is drawn. Banking sector in Nepal has expanded substantially in the last one and a half decade, following the financial liberalization policy. People now have several choices in pursuing their banking activities. This sector has gradually embraced modern technologies to deliver value added product and services to its clientele. However, the expansion and adoption of new technologies has brought new types of risk to the fore,

the management of which is crucial for the bank and the banking industry in the long run. Nepalese banking industry is faced with variety of serious challenges, the prominent being the management of large volume of non- performing loans and the development of corporate values and ethics among the stakeholders in the banking industry.

Based on findings, the average capital adequacy ratio of MBL is higher than other bank, it shows MBL is maintain adequate capital ratio. The average non-performing ratio of EBL is lower among the sample shows the safe investment of banks. The average cash reserve ratio of EBL is higher among the sample shows the higher liquidity of banks. The average assets growth ratio of MBL is higher among the shows higher rate of performance of banks. The average return on assets ratio of EBL is higher among the sample shows the performance and profitability of banks. The average return on equity ratio of EBL is higher among the sample shows the higher profitability of banks. The correlation coefficient between ROA and CAR is positively correlated and NPLR, CRR and AGR Ratio is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROA and Negative correlation shows increase in ratio decreasing the ROA. The p value of CAR and NPLR is insignificant and CRR and AGR is statically significant. The correlation coefficient between ROE and CAR, CRR and AGR is positively correlated and NPLR is negatively correlated. Positive correlation shows the increasing the ratio increasing the ROE and Negative correlation shows increase in ratio decreasing the ROE. The p value of all dependent variables are statically significant.

The variable is contribute that 41.4% of the total variations in average ROA is explained by regression equation and remaining 59.6% is due to the effects of other factor. Value of F is 4.417 and F(sig) is 0.008 so the variable are significantly statistics. The regression line for ROA, the constant is 0.0014, CAR is 0.055, NPLR is -0.16, CRR is -0.012, and AGR is -0.012 times responsible for the change a point of ROA. Value of P in CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significant and CRR and AGR is insignificant. The variable are contribute to effect on ROE is 12%. It indicates that 12% of the total variations in average ROA is explained by regression equation and remaining 88% is due to the effects of other factor. Value of F is 0.825 and F(sig) is 0.506 so the variable are significantly statistics. The regression line for ROE, the constant is 0.05, CAR is 0.24,

NPLR is 0.42, CRR is 0.73, and AGR is 0.02 times responsible for the change a point of ROE. Value of P in CAR and NPLR less than 0.05 so variables are significantly statics at 0.05 level of Significant and CRR and AGR is insignificant.

We can say that continual review and classification of loans enables banks to monitor quality of their loan portfolio and to take remedial action to counter deterioration in credit quality. Besides, these three indicators there are various other indicators of credit risk which can hamper on the performance of bank. Thus, it can be concluded that relationships of independent variables of commercial banks shows low impact on profitability.

### **5.3 Implication**

Based on the findings from the empirical analysis, the study offers the following implications through which they can work to improve banks management practice and to have effective role in increasing profitability of banks. It also includes recommendations.

1. Managers should pay more attention to improving capital adequacy since it positively enhances financial performance while reducing nonperforming loans by applying modern strategies and techniques for credit risk management.
2. Managers should get information about credit risk for the bank.
3. Stakeholder should find information about factor affecting investment or risk related to credit.
4. Managers should know about the relationship between ROA, ROE and capital adequacy, cash reserve ratio, assets growth ratio and non-performing loan ratio.
5. Managers should know risk management technique for the credit risk.
6. Managers should know credit risk management and profitability of commercial bank.
7. This study also helpful for the further analysis about credit risk management and other risk management.

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## Appendix

Annual report of from 2010/11 to 2019/20

Banks	Year	NPL	Total Loan	Net Profit	TE	TA
EBL	2010/11	108512928	31057691462	931303628	3113546056	46236212262
	2011/12	307492696	35910974673	1090564222	4177302887	55813129057
	2012/13	276198772	43393187065	1471117291	4827844672	65741150457
	2013/14	470404039	47572024207	1549698560	5457147460	70445082845
	2014/15	367164030	54482465225	1574352443	6890377025	99167293661
	2015/16	264422150	67955107021	1730207025	8514088112	113885046402
	2016/17	198904860	77287764142	2006247780	11544581880	116510445575
	2017/18	187716000	94182247596	2581681778	16134507415	144811151443
	2018/19	177258000	112007182134	3054122062	17625063404	170077533454
	2019/20	265715000	119069238189	2516243710	18637356460	185023189704
MBL	2010/11	614013949	14408748683	89230030	1782433898	19605874101
	2011/12	455950744	15602700843	382129590	2648076726	24357253387
	2012/13	614303178	21164910179	148599200	2796675926	30296203445
	2013/14	525295941	29053242779	454687791	3235708172	40723957096
	2014/15	222179730	34261302841	616372739	3990975669	48753495062
	2015/16	241496528	43636186147	898222681	5340202751	59455467829
	2016/17	195834545	51167860081	1302483429	8663762010	68925737686
	2017/18	286384389	63250731379	1249688316	10356871786	84787647814
	2018/19	290891000	75535900000	1697088243	11236871503	105246046329
	2019/20	494079000	92529226532	1265150663	11584702840	124519568920
	2010/11	1411000000	29699000000	249000000	-2678000000	44376000000
	2011/12	1553000000	27670000000	123000000	-209000000	52601000000
	2012/13	1714000000	35612000000	128000000	3347000000	57679000000
NBL	2013/14	1982000000	37852000000	755000000	3873000000	70777000000

2014/15	2108000000	41857000000	717000000	5516000000	73782000000
2015/16	2044000000	60239000000	484000000	6850000000	105577000000
2016/17	2354000000	71018000000	2883000000	12089000000	120088000000
2017/18	2309000000	75556000000	3118000000	13226000000	130226000000
2018/19	2515000000	78296000000	3216000000	22922000000	136811000000
2019/20	2825000000	95724000000	2597000000	29281000000	171515000000

Banks	Year	Capital Fund	RWA	Cash Reserve	Total Deposit
EBL	2010/11	3605840000	34583547000	4706320590	41127914339
	2011/12	4574751000	41525347000	8159753523	50006100272
	2012/13	5777682000	49834045000	8205090428	57720464632
	2013/14	6328487000	56780162000	9446921621	62108135754
	2014/15	8457023000	63451114000	17126155823	83093789957
	2015/16	10094804000	79711762000	13356018296	91638884356
	2016/17	13063702000	88929577000	14577083855	94091892005
	2017/18	15616670000	110005455000	18938747835	115511705922
	2018/19	16955638000	123391104000	23304568526	129658152895
	2019/20	17780357000	132882211000	19972674889	143545475184
MBL	2010/11	1900504000	17616652000	1094664194	18535917002
	2011/12	2797454000	18599024000	2932038138	21546396532
	2012/13	2923876000	23317869000	3081826693	27136654448
	2013/14	3456483000	32528811000	3808028939	44205637252
	2014/15	4351915000	35544370000	4616007818	49423275270
	2015/16	5726052792	46342575782	3808028939	52291877270
	2016/17	9091177000	54053406000	5461439334	57326856207
	2017/18	10623725000	69166248000	7096607818	71142372641
	2018/19	11308458000	88424136000	3226962097	85198402144
	2019/20	14817166000	113844889000	4552001488	104098899866
NBL	2010/11	-4303512000	42258993000	9343275261	46808435445

2011/12	-4789138000	42643336000	10635913746	56052372000
2012/13	-424918000	71433221000	10411747656	62984350000
2013/14	3593123000	79008725000	2919002808	69337600000
2014/15	4398193000	54992965000	4692172069	77998800000
2015/16	7439635000	68479980000	10919796322	89410018733
2016/17	12158912000	84053201000	9394404252	93944014252
2017/18	11039740000	97993125000	6283655201	99540725663
2018/19	22244812000	132429132000	10178321131	117200788938
2019/20	23007434000	13522795000	6125276757	146488300000

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