

**“CREDIT RISK MANAGEMENT OF  
JOINT VENTURE BANKS”**

**(With Special Reference to HBL and NSBL)**

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## **RECOMMENDATION**

This is to certify that the Thesis

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**Entitled:**

**A STUDY ON CREDIT RISK MANAGEMENT OF JOINT VENTURE BANKS**

**(With reference to HBL Bank and NSBL Nepal)**

*Has been prepared and approved by this department in the prescribed format of faculty of management. This thesis is forward for examination.*

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**(With reference to HBL Bank and NSBL Nepal)**

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## **DECLARATION**

I hereby declare the entitled; **A STUDY ON CREDIT RISK MANAGEMENT OF JOINT VENTURE BANKS (With reference to HBL & NSBL BANK)** submitted to office of dean faculty of management, T.U. is my original work completed for the partial fulfillment of the requirement of the degree of master of business studies under the supervision of Asso. Prof. Rita Maskey and Lecturer Binita Manandhar.

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## **ABBREVIATIONS**

A.D	Anno Domini
B. S.	Bikram Sambat
CD	Credit Deposit Ratio
Co.	Company
CRR	Cash Reserve Ratio
F/Y	Fiscal Year
FA	Fixed Assets
LA	Loan & Advance
LTD	Limited
MBA	Masters' of Business Administration
MBS	Masters' of Business Studies
NSBL	Nepal SBI Bank Limited
NRB	Nepal Rastra Bank
Rs.	Rupees
HBL	Himalayan Bank Limited
T. U.	Tribhuvan University

# CHAPTER - I

## INTRODUCTION

### 1.1 Background of the Study

Generally, Banks refers to a commercial bank at present. Therefore, the activities of commercial bank are synonymous to banking. Commercial bank refers to such type of bank which deals in money exchange, accepting deposits, advancing loans. The pace of time has changed the portfolio of banking business from its primary function to the function such as merchant banking, credit card business, documentary credit travellers, cheque, home banking etc.

Since the introduction of financial liberalization in 1980s, we can see noticeable change in the financial sector, work specialization, increase in new banking services, and excess to banking facilitation for the general people are considered as positive signals, in the financial markets. The concept of fair competition in this sector is emerging. However financial institutions are facing problems like traditional style of work, poor information system and ineffective management. The countries implementing the open market policy emphasize on the role of private sector in order to get sustainable growth. It is realized that the government has to encourage private sector to upgrade the economic and the social standard of general people by focusing its resource on employment generation, education, infrastructure development and social services. There is a concept that where the total asset of banking sector is more than that domestic product such country is considered as developed country. Nepal's total assets of banking systems to total domestic product ratio is 60% where as 210% in China, 74% in Indonesia, 149% in Japan, 153% in Korea, 158% in Malaysia, and 211% in Taiwan.

Financial sector includes a wide range of economic activities of the country. It covers from national growth to individual savings. Financial sector is basically administered by economic policy. Financial policy, monetary policy and policies for financial

institutions are also equally important for balanced national economy. Nepal Rastra Bank (NRB) has the authority to implement the monetary policy with different target and tools. Among the financial institution, the commercial banks are the major components in implementing the reforms policy making new credit management in financial institution. Credit in finance is the term used to denote transaction involving the transfer of money or other property on promise of repayment, usually at a fixed future date. The person who deposits money in the bank becomes creditors and the person who borrows the money from the bank becomes the debtor of the bank. The principle function of credit is first to transfer property in the name of bank, who want to take loan. The temporary made for a loan price and interest. At the time of providing loan bank should follow some principals and practice. No banker would give loan, unless he/she has sufficient confidence in the borrower that will not be necessary to seek the help of court for recovery. Safety of funds, purpose of loan, security for loan, profitability, spread of loan, portfolio of compliance with national interest are some of the principle that bankers should follow while granting loan. Beside that character of person receiving credit the capacity of borrowers to utilize the fund, the percentage of borrowers stake in the business are the basic elements, which measure the quality of borrower and ultimately the quality of loan. Credit management has to face on the risk analysis in the loan investment portfolio. Generally it is accepted that disadvantage sectors in the economy such as the farmers and the small business have been neglected by the banking industry in other words, such sector in the economy are not receiving the financial support as commercial banks hesitate to be involved in these sectors where they do not see adequate profit.

Joint venture banks are facing competitive challenge to enhance earning these days. No banks can survive for a long run out proper understanding of economy of the country. Interest rate is in decreasing trend in load as well as savings. There is high competition among the banks. Hence banks should explore new loan and deposit scheme to attract the customer. This way commercial bank plays an important role in the development of trade, commerce and industry. Commercial banks are established on the basis of commercial bank act. These banks are such type of banks, which accept and relend these deposits to the people for short term.

The credit policy of the firm provides the framework to determine whether or not to extend credit and how much credit to extend. The credit policy decision of a bank has two broad dimensions, credit standard and credit analysis. A firm has to establish and use standards in making credit decisions, develop appropriate sources of credit information and method of credit analysis (Roy; 1974:254).

Credit management strongly recommends analyzing and managing the credit risks. Credit risk is defined as the possibility that a borrower will fail to meet its obligation in accordance with the agreed terms and conditions. Credit risk is not restricted to lending activities only but includes of balanced sheet and enters bank exposure. The goal of credit risk management is to maximize a bank's risk adjusted rate of return by maintaining the credit risk exposure within acceptable parameters. For most banks, loan are the largest and most obvious source of credit risk, however other sources of credit risk exist throughout the activities of bank, including in the banking book and in the trading book and both on and off balance sheet . Banks are increasingly facing credits risk in various financial instruments other than land including acceptance, interbank translation, trade financing, foreign exchange transactions, guarantees and the settlement of transaction. This study devoted credit risk management is one of the attempts to address at least some of these issues.

## **1.2 Profile of Concern Banks**

### **A. Himalayan Bank Limited (HBL)**

Himalayan Bank Limited was incorporated in 1992 by few distinguished business personalities of Nepal in partnership with Employees Provident Fund and Habib Bank Limited, one of the largest commercial bank of Pakistan. Banking operation commenced from January 1993. It is the first commercial bank of Nepal whose maximum shares are held by the Nepalese private sector. Besides commercial banking services, the bank also offers industrial and merchant banking services. Paid-up capital is Rs 2400.00 Mio. The Bank's mission is to become preferred provider of quality financial services in the country. There are two components in the mission of the Bank; Preferred Provider and Quality Financial Services; therefore HBL believe that the mission will be accomplished only by satisfying these two important

components with the Customer at focus. The Bank always strives positioning itself in the hearts and minds of the customers.

Besides commercial activities, the bank also offers industrial and merchant banking. Products such as Premium Savings Account, HBL Proprietary Card and Millionaire Deposit Scheme besides services such as ATMs and Tele banking were first introduced by HBL. At present, the bank has 40 branches working around the country. The bank has a very aggressive plan of establishing more branches in different parts of the Nepal in near future. The bank provides services like 'Any Branch Banking Facility', Internet Banking and SMS Banking. Living up to the expectations and aspirations of the customers and other stakeholders of being innovative, HBL very recently introduced several new products and services. Millionaire Deposit Scheme, Small Business Enterprises Loan, Pre-paid Visa Card, International Travel Quota Credit Card, Consumer Finance through Credit Card and online TOEFL, SAT, IELTS, etc. fee payment facility are some of the products and services. Himalayan Bank's policy is to extend quality and personalized services to its customers as promptly as possible. To extend more efficient services to its customers, Himalayan bank has been adopting innovative and latest banking technology. Himalayan Bank Limited holds of a vision to become a Leading Bank of the country by providing premium products and services to the customers, thus ensuring attractive and substantial returns to the stakeholders of the Bank.

## **B. Nepal SBI Bank Limited (NSBL)**

Nepal SBI Bank Ltd. (NSBL) is the first Indo-Nepal joint venture in the financial sector sponsored by three institutional promoters, namely State Bank of India, Employees Provident Fund and Agricultural Development Bank of Nepal through a Memorandum of Understanding signed on 17th July 1992. NSBL was incorporated as a public limited company at the Office of the Company Registrar on April 28, 1993 under Regn. No. 17-049/50 with an Authorized Capital of Rs.12 Crores and was licensed by Nepal Rastra Bank on July 6, 1993 under license No. NRB/1.Pa./7/2049/50. NSBL commenced operation with effect from July 7, 1993 with one full-fledged office at Durbar Marg, Kathmandu with 18 staff members. The staff strength has since increased to 580. Under the Banks & Financial Institutions Act, 2063, Nepal Rastra Bank granted fresh license to NSBL classifying it as an "A" class

licensed institution on April 26, 2006 under license no. NRB/I.Pra.Ka.7/062/63. The paid of Capitals have been increased to Rs. 2102.96 Mio. Since its inception on July 7, 1993, Bank is continuously upgrading quality of its service delivery and customer satisfaction with the help of state-of-the-art technology. Extending the reach to 27 districts through 59 physical outlets including 50 branches, 6 extension counters and three administrative offices; NSBL are among largest private banks in Nepal. In addition, Bank serve their valued customers through e-delivery points like Mobile Banking, Automated Teller Machines (ATMs) and Online Banking service for both corporate and retail clients. The management team and the Managing Director who is also the CEO of the Bank are deputed by NSBL. NSBL also provides management support as per the Technical Services Agreement. Fifty five percent of the total share capital of the Bank is held by the State Bank of India, fifteen percent is held by the Employees Provident Fund and thirty percent is held by the general public.

### **1.3. Statement of the Problem**

The problem of the study will ultimately find out the reasons about the credit management. A study on the credit management of the commercial banks would be highly beneficial for pointing out their strength and weakness. Although joint venture banks have managed to perform better than other local commercial banks within short span of time, they have been facing a neck-to-neck competition against one another fluctuating and low interest rates on deposits, poor deposit mobilization trade, commerce etc. have affected on the return of funds, total assets, total deposits and shareholders wealth position. Since the joint venture banks have been established gradually because of the liberal and market –oriented economic policy (Report) of Nepal Government, they have been facing though competition from other commercial banks and of course each other. Although various joint venture banks operating in Nepal after Nepal Government adopted the open liberal and market oriented economic (Report), the financial sectors have not been enough to meet the growing resource need to the economy as expected before. Why is so and what is the problem? To answer this question an analysis of their present credit management is necessary. Therefore, focus of the present study is on the credit management of the joint-venture banks in Nepal.

Since the liberalization policy of the government, various banks and financial institutions has been established with, a view to reinforce the economic growth of the country. They have played an indispensable role by accepting deposits and granting loans. Investment of the collected funds is the most important factor for both shareholders and the bank as they are the source of earning. Credit extended by these banks is directly related to the national interest.

Joint Venture Banks are of utmost importance as they have contributed significantly to the overall economic development of the country. Yet, after so long since their establishment and successful operations for almost two decades, they are not free from problems and hindrances in their avenue. These banks have been operating pretty well from its inception. It has been awarded prestigious titles because of its experience in the field of international banking, hi-tech computerized services, professional attitude, qualified and experienced work force, quality and reliable services that served as the key factor for its rapid progress. It has been able to control and capture a remarkable leadership of Nepalese banking sector in a relatively short period in terms of both market share and market price. Project appraisal method followed by commercial banks is not scientific and appropriate. Granting loan against insufficient deposits overvaluation of goods pledged, land and building mortgaged, risk-averting decision regarding loan recovery and negligence in recovery of overdue loans are some of the drawbacks of unsound investment policy. Similarly, loan supervision and follow-up mechanism is lacking in many commercial banks.

Credit management strongly recommends analyzing and managing the credit risks. Credit risk is defined as the possibility that a borrower will fail to meet its obligations in accordance with the agreed terms and conditions. The goal of the credit risk management is to maximize a bank's risk adjusted rate of return by maintaining the credit risk exposure within acceptable parameters. For most banks, loan are the largest and most obvious sources of credit risk, however, other sources of credit risk exist throughout the activities of a bank, including in the banking book, and in the trading book, and both increasingly facing credit risk in various financial instruments other than land, including acceptances, inter bank transactions and guarantees and the settlement of transactions.

The mushrooming of banking and being finance companies and about a dozen of rural banking and cooperative societies in a short span of time has brought new competitive scenario and has faced a challenged to the previously monopolistic banks that were making attracting profit. In the changed scenario, these banks need to explore their strengths and weakness, and improper their performance because their success depend upon their ability to their productivity and financial preference.

Thus, the study aims to answering following problems and has tried to analyze, how the banks are performing in credit sector and how they stand in compassion to one another.

- What is credit risk, liquidity risk and interest rate risk of commercial banks?
- What is the level of systematic and unsystematic risk in commercial banks?
- What is the investors' perception on the risk of commercial banks?
- How is the Nepalese commercial banks to face the competition of foreign banks ?

#### **1.4 Objectives of the Study**

The main objective of this study is to find out risk management position of Nepalese banks. The specifics objectives of the study are as follows:

- To examine the Credit Risk of selected commercial banks in Nepal
- To examine the credit risk management system of the Banks under study.
- To determine the relationship between total deposit and loan and advances and other key indicators.

#### **1.5 Limitations of the Study**

The outcome of the study is an individual effort. Therefore management, resource mobilization and time constraints limit the in-depth study of all commercial banks operating except commercial banks under study.

- There are 31 commercial banks in Nepal that are in operation, among them 25 banks are listed in NEPSE. But the study does not include the entire listed commercial banks.

- The evaluation is made through the analysis of financial statement published and presented by the banks. Therefore generalization of the whole banking industry cannot be made.
- Resource, time, money constraints and inaccessibility of sufficient information also limit the conclusion drawn from study.
- This study may not be precise as it is prepared to fulfill the partial requirement of the MBS program.
- The study has covered only the five years data from fiscal year 2008/09 to 2012/13.

### **1.6 Rationale for the Selection of the Study**

Banks are the principal agents of money market, which in turn, is the major instilment of the financial system. Thus banks and their lending transaction obviously affect the national economy. Moreover, lending and borrowing transaction that takes place through the banks influence the daily livings of each nation and at the same time from the government side, a peat concern should be taken as the misleading by the banks can violate the total economic system. Bank's financial management system can contribute the economic growth too because these banks are the major variable of financial market. In this way, the relationship between the government financial policy and the banks might be considered as a keen subject to study.

### **1.7 Organization of the Study**

The study is divided into following chapters:

#### **Chapter I: Introduction**

The first chapter is concern about the introduction, focus of the study, problem of the study, objective of the study, importance of the study, limitations of the study.

#### **Chapter II: Review of literature**

The second chapter is concentrated upon review of literature. This chapter is subdivided into various sections such as conceptual framework review from different

studies, review from journals, articles, magazines and review of previous master's thesis.

### **Chapter III: Research Methodology**

The third chapter provides the methodology adopted in the research. It comprises research design, sources of data, methods of analysis and its descriptive presentation

### **Chapter IV: Presentation and Analysis of Data**

The fourth chapter is the presented and analysis of data and major findings by using appropriate tools.

### **Chapter V: Summary, Conclusion and Recommendations**

The last chapter gives the summary, conclusions and different recommendations regarding it.

Recommendation sheet, Declaration, Acknowledgement, Table of contents, List of table, List of figure, Abbreviation has been included at the beginning of this report where as bibliography and appendixes have been included at the end.

## CHAPTER - II

### REVIEW OF LITERATURE

#### 2.1 Conceptual Framework

“Banking is the business of collecting and safeguarding money as deposits and lending of same. The banker’s business is then to takes the debt of other people to offer his own in exchange and thereby to create money. He may be a dealer in debts, but in distress is only the observer of wealth and it would be equally permissible to describe the banker as a liquefier of wealth” (Brealy, 1991: 81).

A frequently neglected but an important role is the provision of credit. Credit policy is sometimes, omitted entirely from an analysis of marketing mix by academics. This is despite empirical findings that although the credit package is unlikely to be the primary factor in determining overall patronage success. It may serve to clinch a contract when suppliers’ offerings are otherwise equally attractive.

The credit policy cannot be sound unless it is based on clear knowledge of the cost of credit. The cost is determined by the quantity of credit sales, the average collection period and the opportunity cost of capital. While a marginal costing approach should be used which takes only incremental cost into account, the full opportunity cost has to be considered. The overall cost of credit will also be affected by the expected rate of inflation. Foreign accurate assessment of the cost of capital, a discounting approach should be used. A credit package can be differentiated in various ways; by duration, by interest charge, and by the interaction with the rest of the pricing mix.

A commercial bank is a business organization that receives and holds deposits of fund from others makes loans or extends credits and transfers funds by written order of deposits. Commercial bank is a corporation, which accept demand deposits subject to check and makes short-term loans to business enterprises, regardless of the scope of its other services. A commercial banker is a dealer in money and substitute for money such as cheques or bill of exchange. He also provides a variety of financial services.

Commercial bank Act 2031 B.S. of Nepal has defined that “A commercial bank is one which exchanges money, deposits money, accepts deposits, grants loans and performs commercial banking functions and which is not a bank mean for cooperative, agriculture, industries for such specific purpose.” But, recently, the Bank and Financial Institutions Ordinance, 2060 has merged the five banking Acts including the commercial bank Act, 2031 which defines the bank with respect to their transactions. This Act is trying to categorize the banking institutions in two ways based on their transactions. According to this Act, “Bank is the institution which performs its transactions under the section 47 of this Act.” ([www.nrb.org.np](http://www.nrb.org.np))

This Act has laid emphasis on the functions of commercial bank while defining it. Commercial banks provide short-term debts necessary for trade and commerce. They take deposits from the public and grant loans in different forms. They purchase and discount bills of exchange, promissory notes and exchange foreign currency. They discharge various functions on the behalf of their customers, provided that they are paid for their services.

Financial activities are necessary for the economic development of the country and commercial banking in this context is the heart of financial system. Optimal investment decision plays a vital role in each and every organization. But especially for the commercial bank and other financial institutions the sound knowledge of investment is the most because this subject is relevant for all surrounding that mobilize funds in different sectors in view of return.

As it is concerned to the commercial banks and other financial institutions, they must mobilize (i.e; investment in different sectors) their collections (deposits) and other funds towards the profitable, secured and marketable sectors so that they will be in profit. For this purpose these banks and financial institutions should gather the sufficient information about the firm (client) to which supposed to be invested, these information include as financial background, nature of business as well as its ability to pay the loan back. These all information should be gathered from the viewpoint of security.

The income and profit of the bank depend upon the lending procedure applied by the bank. And, lending policy and investment in different securities also affect the income and profit. In the investment procedures and policies is always taken in mind that “the greater the credit created by the bank, the higher will be the profitability.” A sound lending and investment policy is not only prerequisite for bank’s profitability but also crucially significant for the promotion of commercial savings of a developing country like Nepal.

The sound policies help commercial banks maximize quality and quantity of investment and thereby, achieve the own objective of profit maximization and social welfare. Formulation of sound investment policies and coordinated and planned efforts pushes forward the force of economic growth.

Commercial banks as financial institutions perform a number of internal functions. Among them, providing credit is considered as most important one. “Commercial banks brings into being the most important ingredient of the money supply, demand deposit through the creation of credit in the form of loan and investment” (Dahal; 2002).

### **2.1.1 Credit Risk Analysis**

Credit is regarded as the most income generating assets especially in commercial banks. Credit is regarded as the heart of the commercial banks in the sense that; it occupies large volume of transactions; it covers the main part of the investment; the most of the investment activities based on credit; it is the main factor for creating profitability; it is the main source of creating profitability; it determines the profitability. It affects the overall economy of the country. In today’s context, it also affects on national economy to some extent. If the bank provides credit to retailer, it will make the customer status. Similarly, it provides to trade and industry, the government will get tax from them and help to increase national economy. It is the security against depositors. It is proved from very beginning that credit is the shareholder’s wealth maximization derivative. However, other factors can also affect profitability and wealth maximization but the most effective factor is regarded as credit. It is most challenging job because it is backbone in commercial banks. Thus, effective management of credit should seriously be considered.

Webster's new collegiate dictionary defines a ratio as "The indicated quotient of two mathematical expressions and as the relationship between or more things." In financial analysis a ratio is used as benchmark for evaluating the financial position and performance of a firm" (Webster; 1999).

### **Standard of Comparison**

The ratio analysis involves comparison for a useful interpretation of financial statements. A single ratio in itself doesn't indicate favourable or unfavourable condition. It should be compared with some standard. Standard of comparison may consist of:

- Past ratios – ratio calculated from the past financial statement of the same firm.
- Projected ratio – ratio developed using the projected or financial statement of the same firm.
- Competitor's ratio – ratio of some selected firms, especially the most progressive and successful competitor, at the same point in time.
- Industry ratio – ratios of the industry to which the firm belongs.

### **2.1.2 Types of Credit Risk Ratios**

Several ratios calculated from the accounting data can be grouped into various classes according to financial activity or function to be evaluated. Long-term creditors or the other are more interested in the long-term solvency and profitability of the firm. Similarly owners concentrate on the firm's profitability and financial condition. Management is interested in evaluating every aspect of firm's performance. They have to protect the interests of all parties and see that the firm grows profitability. In view of the requirement of various ratios they may classify into following groups.

#### **Credit Practices Ratio**

##### **• Total Loan to Total Deposit Ratio**

The main source of bank's lending depends on its deposit. This ratio is calculated to find out how successfully the banks are utilizing their deposits on loan and advances

for profit generating activities. Greater ratio indicates the better utilization of total deposits.

- **Loan and Advances to Total Assets Ratio**

Loan and advance is the major part of total assets for the bank. This ratio indicates the volume of loans and advance out of the total assets. A high degree of the ratio indicates that the bank has been able to mobilize its fund through lending function. However lending always carries a certain risk of default. Therefore a high ratio represents low liquidity and low ratio represents low productivity with high degree for safety in terms of liquidity.

- **Loan and Advances to Current Assets**

Loan and advances is the major component in total assets, which indicates the ability of banks to canalize its deposits in the form of loan and advances to earn high return. If sufficient loan and advances cannot be granted it should be paid interest on those utilized deposit funds and may lose earnings. So commercial banks provide loan and advances in appropriate level to find out portion of current assets, which is granted as loan and advances (Scott; 1992).

- **Interest Income to Loan and Advances**

Interest income to loan and advances is one of the major sources of income for a commercial bank. The high volume of interest income is indicator of good performance of lending activities.

- **Loan Loss Provision to Total Loan and Advances Ratio**

It describes the quality of assets that a bank is holding. NRB has directed the commercial banks to classify its loan and advances into the category of pass, standard, doubtful and loss and to make the provision of 1, 25, 50 and 100 percent respectively. NRB has classified the pass and standard loan as performing loans and other two types of loans non-performing loans. The provision created against the pass and standard loan is called the general loan loss provision and provision created against the doubtful and loss loan is called specific loan loss provision. The provision for loan

loss reflects the increasing probability of non-performing loan. Increase in loan loss provision decreases in profit result to decrease in dividends. But Its positive impact is it strengthens the financial conditions of banks by controlling the credit risk and reduced the risks related to deposits. The low ratio indicates the good quality of assets in total volume of loans and advances. High ratio indicates more risky assets in total volume of loan and advances.

- **Non-Performing Loan to Total Loan and Advances Ratio**

NRB has directed all the commercial banks create loan loss provision against the doubtful and bad debts. But our concerned banks have not provided data on non-performing loan in Balance Sheet and Profit & Loss A/C. To measure the volume of non-performing loan to total loan and advances the main indicator of NABIL and SCBNL has been used. This ratio shows the percentage of non-recovery loans in total loans and advances.

### **Credit Efficiency Ratio**

- **Interest Expenses to Total Deposit Ratio**

This ratio measures the percentage of total interest paid against total deposit. A high ratio indicates higher interest expenses on total deposit. Commercial banks are dependent upon its ability to generate cheaper fund. The cheaper fund has moved the profitability of generating loans and advances and vice versa.

- **Total Loan to Liabilities Ratio**

Banks create credit through loans and advances and multiply their assets much more times than their liability permits. This ratio measures the ability of a bank to multiply its liability into assets. The higher ratio of total assets to total liability ratio is favorable as it increases overall capacity of the organization.

- **Interest Expenses to Total Expenses Ratio**

This ratio measures the percentage of interest paid against total expenses. The high ratio indicates the low operational expenses and vice versa. The ratio indicates the costly sources of funds.

- **Non-Interest Bearing Deposit to Total Deposit Ratio**

This ratio measures the volume of non-interest bearing deposits to total deposit. The volume of interest expenses in total expenses represents a large portion of the total expenses. How efficiently the deposits were managed affectively in the total volume of expenses. The banks need to manage the portfolio of the deposits i.e; it has to maintain certain proportion between interest bearing deposits and non-interest bearing deposits by administering the interest rate structure. The higher ratio is favorable but in practices, interest bearing deposits always plays a significant role in the mix deposit liability.

- **Interest Income to Total Income Ratio**

Income is one of the most important factors of each and every organization. Interest income occupies a greater portion of the total income in a banking business. This ratio measures the volume of interest income in total income. It helps to measures the bank's performance on other fee based activities too. The high ratio indicates the high contribution made by lending and investment whereas low ratio indicates low contribution made by lending and investment and high contribution by other fee based activities in total income.

- **Interest from Loan, Advances and Overdraft to Total Interest Income Ratio**

This ratio measures the contribution made by interest from loan, advances and overdraft. Loan and advances generate the major portion of interest income. Hence this ratio measures how efficiently the banks have employed their fund and loan & advances and overdraft.

- **Interest Suspense to Total Interest Income from Loan & Advances Ratio**

Interest suspense means the interest due but not collected. NRB directives do not allow the commercial banks to book due but unpaid interest into income. The increase in the interest suspense decreases the profit of the company. Such interest is shown in liability side of Balance Sheet under the heading "other liability". This ratio, interest suspense to total interest income from loan & advances, measures the composition of due but uncollected interest in the total interest income from loans &advances. The

high degree of this ratio indicates the low interest turnover and low degree of this ratio indicates high interest turnover. This ratio also helps to analyze the capacity of the bank in collecting the repayments of the loan and advances.

### **2.1.3 Factors Affecting Credit Policy**

Generally, the following factors are to be considered to make effective loan management. It is also called the factors of credit policy. It helps to get effective credit worthiness.

- **Industry Environment**

It determines the nature of the industry structure, its attractiveness and the company's position within the industry, structural weakness of a company, which is disadvantaged, theaters first way out and security value.

- **Financial Condition**

It determines the borrower's capacity to repay through cash flow as the "First way-out". The strength of "second way-out" i.e.; through collateral liquidation is also assessed. Further the possibility to fall back on income of sister concerns in case of financial crunch of the company condition theaters repayment capacity.

- **Management Quality**

It determines the integrity, competence and nature of alliances of borrower's management team. Weakness in replacements needs to be evaluated.

- **Technical Strength**

It determines the strength and quality of the technical support required for sustainable operation of the company in terms of manpower and technology used. Appropriate technical competencies of the manpower, the viability of the technology uses, availability of after sales service, cost of maintenance and replacement need to be evaluated.

## • Security Realization

It determines the control over various securities obtained by bank to secure the loan provided excitability of the security documents and present value of the properties mortgaged with the bank. Weakness in security threatens the bank's second way out.

### 2.1.4 Alternative Structure for Credit Portfolio Management (CPM)

The establishment of credit portfolio management is typically an evolutionary process for each banking institution. At start-up, CPM usually takes a defensive role eliminating concentration risk and culling underperforming relationships from the risk/return point of view. As CPM develops, optimization of the selected portfolio is added to its role, adjusting exposure to take into account the best risk/return structure. The adjustments often use the credit derivatives markets in order to disturb the primary relationship with the customer. In its advances form, CPM adds the bank's credit view to its role, with the intention of improving the portfolio's relative value performance among different asset classed.

The state of CPM along this development curve often dictates whether it is located inside the wall (subject to the possibility of receiving non public information) or outside the wall (not subject to non public information and freer to adjust positions).

### 2.1.5 Functions of Credit Portfolio Management

CPM achieves two principle goals:

- i. To match required hold levels with desires hold levels
- ii. To optimize the portfolio of assets ultimately held by the bank.

To do this effectively, CPM must perform all or some of the following key functions, depending on the state of the developmental curve discussed above:

- Serve as an analytical and advisory group to the line and to the approval authorities, plus serve as an integral part of critical deal teams.
- Prepare the credit approval package and advocate the transaction to the credit approval authorities.
- Closely monitor obligor risks, returns, and concentrations.

- Evaluate, establish, and effectively use advanced modeling techniques to help determine the potential risk inherent in the portfolio and its assets correlations.
- Manage those same risks through the judicious use of loan sales and synthetic instrument such as credit default swaps and CDOs.

**Functionally, Credit is now segmented into four parts**

1. Origination and determination of the required level of customer commitment. The sales/relationship function in credit portfolio management is often separate from the analysis/underwriting function. This allows for an efficient use of resources for client development as well as analytical discipline and consistency. The relationship manager determines the commitment level that will maximize relationship income.
2. Fundamental analysis of the individual credit. The underwriting function in credit portfolio management is charged with the more traditional responsibility of individual credit analysis and monitoring. But this function is being driven more and more toward a specialization based on industry, so that the full benefits of analyzing alternative borrowers within an industry can be achieved. The more specialized structure enables CPM to provide key value-added analysis to relationship and product managers in complex customer support for example, merger and acquisition analysis. It also provides for a centralized, efficient use of analytical resources.
3. Portfolio monitoring. Many more tools and information resources exist today than were available in the past for portfolio monitoring. For example;
  - Institutions now set various portfolio limits to shape the structure of the desired portfolio.
  - Early-warning processes to measure portfolio deterioration have become an integral part of credit risk management.
  - For large corporate portfolios, Merton-based models relate information inherent in the equity markets to a firm's debt levels.
  - Bond spreads and credit derivative premiums provide a forward looking credit view from the market that can be compared with a bank's own credit view.

4. The role of credit approval authorities. The credit approval function determines the desired exposure level for the institution's books within the context of pre-established limits by obligor and industry. As a result, credit approval manages expected loss and allocates capital to desirable transactions. CPM, as separate from credit approval, optimizes the use of capital through alterations to the portfolio's profile.

## **2.2 Review of Related Studies**

Present section deals about concept or findings of earlier scholars on the concerned field of the study. It helps to develop the study as link in a chain of research that is developing and emerging the knowledge about the related field.

The effort has been made in this present section to examine and review some related articles published in different economic journals, bulletins, magazines and newspapers.

### **2.2.1 Review of journal and article**

**Shrestha (2004)**, in his article, "*A Study on Deposit & Credit of Commercial Bank in Nepal*" concluded that the credit deposit ratio would be 51.30% other things remaining same in 2004 A.D. which was the lowest under the period of review. So, it is strongly recommended that the commercial banks should try to give more credit earning field as far as possible. Otherwise, they might not be able to absorb even its total expenses.

**Neupane (2007)**, in an article, "*Challenges of Non-Performing Loan Management in Nepal*", She has mentioned the causes of increasing trend of non-performing loan. She identifies the major causes such as poor loan analysis, guarantee oriented loan system, depreciation of valued assets, misuse of loan, lack of regular supervision of loan. Default risk is one kind of investment risk of nonpayment of loan at the fixed future date. In Nepalese context, when interest rate is increased it causes the decreases in economic activities as well as capacity of borrower. Sometimes debtors knowingly do not pay back the loan, and invest the loan in unproductive sector. Such kind of activities occurs continuously, if there is lack of sound credit

policy, improper credit analysis, lack of information about loan holders and lack of regular supervision. So banks should formulate and implement sound credit policy. Loan approval and disbursement process should be conducted in better way. Proper credit analysis and regular supervision can control the credit risk. Another article entitled “lending operation of commercial banks of Nepal and its impact on GDP.”

**Shrestha (2009)** in her articles, “*Lending Operation of Commercial Banks of Nepal and its Impact on GDP*” has presented with the objectives to make an analysis of contribution of commercial banks“ lending to the GDP of Nepal. She has set hypothesis that there has been positive impact of lending of commercial banks to the GDP. In research methodology, she has considered GDP as the dependent variable and various sectors of lending Viz. agriculture, industrial, commercial service bank gives loan to various sectors. This is necessary for long term survival of the bank. Even if any sector is doing very well, the bank does not put its total money in that sector. If the bank concentrates its lending only in one sector, failure of the sector may cause bankruptcy of the bank. Loan mix is components of established credit policy. It is a kind of strategy in credit management for banks to be success. In context of Nepal, there are different sectors in economy such as priority sector, deprived sector, productive sector, government sector etc. So, there should be diversification in investment of every commercial bank. Making investment or lending to various sectors is necessary for the long term survival of the banks.

**Ghimire (2010).** Has conducted “*Credit sector reform and NRB directives*” highlighted the effects of change or amendment in NRB directives regarding loan classification and loan loss provisioning. Although the circumstances leading to financial problems or crisis in many Nepali banks differ in many respects, what is common area most of the banks is the increased size of non-performing assets (NPAs). To resolve the problem of the losses or likely losses of this nature facing the industry NRB has, as the central bank, amended several old directives and issued many new circulars in the recent years. As opined by the study majority of the loans of most of the commercial banks of the country at present falls under substandard, doubtful and even loss categories, loan loss provisioning now compared to previous arrangement would be dramatically higher. The new classification and provisioning norms are very lent able as they help to strengthen banks financially. The study added

that one must remember that the old system remained in force from 1991 to 2001, which was probably the most volatile decade of the business operation of the country. The study has indicated that loan loss provisioning as a percentage of total credit of April 12, 2001 is 5.2% but as April 13, 2003, it has jumped to 18.39. If only private bank are considered, it is 2.12% of April 2001 whereas it is 6.30% as of April 13, 2003. The total increment in LPP is Rs. 11,328.11 million and the total increment in credit is only Rs. 7,976.70. Tightening provisioning requirements on NPL is essential to ensure that banks remain liquid even during economic downturns.

In the conclusion the study has mentioned that in the recent years NRB has worked for management and reform of the credit of the financial institution more seriously and NRB has adopted reforms aimed not just at dealing with problem banks but also at strengthening banking supervision to reduce the likelihood of future crisis. All prudential directives of NRB in connection of credit sector reform have been made revised on after April 2001. To adopt to such changes there can be some difficulties and for a better and harmonized reform NRB should continue to be supportive, proactive and also participative to take options of bankers for a change in regulation/policy taking place in the future.

**Chhetri (2012)** The study on *“Non-performing Assets: A need for Rationalization”*, has attempted to provide connotation of the term NPA and its potential source, implication of NPA in financial sector in the South East Asian region. The study has also given possible measures to contain NPA. Loans and advances of financial institutions are meant to be serviced either part of principle of the interest of the amount borrowed in stipulated time as agreed by the parties at the time of loan settlement. Since the date becomes past dues, the loan becomes non-performing assets. The book of the account with lending institution should be effectively operative by means of real transaction effected on the part of the debtor in order to remain loan performing.

As stated by the writer, the definition of NPA differs from country to country. In some of the developing countries of Asia Pacific Economic Cooperation (APEC) forum, a loan is classified as non-performing only after it has been arrear for at least 6 months. Similarly, it is after three months, in India. Loan thus defaulted are classified into different categories having their differing implication on the asset management of

financial institution. The study also stated that NPAs are classified according to international practice into 3 categories namely Substandard, Doubtful and Loss depending upon the temporal position of loan default. Thus the degree of NPA assets depends solely on the length of time the asset has been in the form of none obliged by the loaner. The more time it has elapsed the worse condition of asset is being perceived and such assets are treated accordingly. "As per the study, failure of business for which loan was used, defective and below standard credit appraisal system credit program sponsored by Government, slowdown in economy/recession, diversion of fund is some the factors leading to accumulated of NPAs.

### **2.2.2 Review of Previous Thesis**

**Parajuli (2004)** has conducted thesis entitled with "*Credit Management of Commercial Banks in the context of Financial Sector Reform Program*" with the following objectives:

- To find out the relevancy of the financial sector reform programmed.
- To measure the comparative output of credit management in joint venture bank and government bank
- To examine the level of non-performing loan investments that exists within the banking industry.

### **Research Tools**

- Beta coefficient
- Portfolio Return
- Portfolio Standard Deviation
- Mean
- Standard Deviation
- Correlation Coefficient

The major findings of the study are as follow:

- Concept of financial reform emerged since 1980's with theeconomic liberalization; HMG/N NRB published the economic and monitory policy to support such reform.

- As the result of these policies, various joint venture banks, established in the private sector. Moreover, under the structural adjustment program of the IMF, the financial sector was further liberalized in 1987.
- The focus of NRB was placed on indirect monetary control. It has been revealed that there has never been any clear and specific credit policy. There were almost similar procedures and policies while granting the credit but the differences in updating them. In fact the bank is running its business without having any define direction, expect to follow the directives issued by the Rastra Bank from time to time in some specific matters.
- The non-performing credit is low of private commercial banks because they focus mainly on credit in the urban areas and big business houses. Such trend of private banks will not help in providing the banking service in t the remote areas and minority people.
- As recommended given by Parajuli that NRB should tight the supervision and inspection activity towards the commercial banks and financial institution can be avoided. However, NRB should regulate all the deposit accepting financial institutions under the supervision and regulatory activity so that general people can feel the security of their deposit and to make the FSRP relevant.

**Maharjan (2006)** entitled “*Loan Management of Nepalese Commercial Banks*” in which he examined the loan management of the commercial banks in Nepal.

The main objectives of the study were:

- To determine how far the banks are investing in the priority sector and the deprived sector.
- To determine the trend of the deposit and the loan
- To determine the loan loss provision made by banks.

### **Research Tools**

- Expected rate of return on common stock
- Portfolio Return
- Sharpe Index Model
- Mean

- Standard Deviation
- Correlation Coefficient

The major findings of the study are as follow:

- The researcher concluded that loan and advances are the profitable assets for the banks and it is very risky too.
- The loans and advances should be effectively managed and controlled.
- The study suggested that the banks should follow the NRB directives strictly for effectiveness and better financial status of the banks.

**Khadgi (2007)**, conducted the study on “*Investment Policy Analysis of SCBNL Bank Ltd.*” and submitted to Shanker Dev Campus in partial fulfillment of the requirement of Degree of Master in Business Studies. The main objectives of the study were as follows.

- To study the resource mobilization and investment policy of SCBNL Bank.
- To find out the relationship between deposit and investment trends of the bank.
- To evaluate profitability, risk, liquidity and assets management of the bank.
- To find out the current and future investing strategy of SCBNL Bank.
- To provide suggestions to improve investment policy and performance of SCBNL Bank based on the findings of the study.

### **Research Tools**

- Systematic Risk
- Unsystematic Risk
- Portfolio Return
- Portfolio Standard Deviation
- Mean
- Standard Deviation
- Coefficient of Variation
- Covariance
- Correlation Coefficient

The findings of the study were;

- The liquidity position of SCBNL bank is below the normal level. The return on assets ratios has a fluctuating trend with mean ratio an average. The C.V. shows that the ratio seems inconsistent and variable during the study period.
- The return on loan and advances ratios is in increasing trend with the mean value an average. The ratio seems to be less variable and consistent.
- The interest earned to total assets ratios is in decreasing with mean an average. The ratio during the study period seems to be consistent and less variable.
- The interest earned to total outside assets ratio of found to be an average during the study period. The C.V. indicates that the ratios are consistent. The analysis shows that the SCBNL Bank has average income margin from outside assets. If the margin is higher than cost of fund, the bank will be on profit.
- The interest paid to working fund ratios is in decreasing trend an average during the study period. The ratio seems to be consistent and less variable.

**Sanjel (2008)**, has carried out a research work on the topic “*Analysis of Investment Policy of Commercial Bank*”. The main objective of the present study is to analyze the liquidity position as well as the investment policy adopted by NBBL, HBL and SCBNL and comparison of such between themselves. Presently the bankers are facing a huge tension of liquidity and this is not a good signal toward the performance of the banks. The study focuses whether it is backward or forward in investing its fund efficiently in industry average. The specific objectives of the study were given below.

- To evaluate the liquidity, assets management, efficiency and profitability of HBL,NBBL and SCBNL
- To analyze the deposit utilization trend of the HBL, NBBL and SCBNL.
- To analyze the relationship between total investment with other financial variables of HBL, NBBL and SCBNL and comparison between them.
- To recommend the package of workable suggestions and possible guidelines to improve investment policy of HBL, NBBL and SCBNL based on the finding of the study.

## Research Tools

- Systematic Risk
- Mean
- Coefficient of Variation
- Covariance
- Correlation Coefficient

Based on this study, her major findings were;

- The mean ratio & CV of current ratio of SCBNL is satisfactory. Only the SCBNL seems capable of paying current obligations. The ratio of HBL seems improving but the NBBL ' trend is deteriorating.
- The mean ratio & CV of cash and bank balance to total deposit ratio of HBL is higher. Higher ratio of HBL shows that it is able to serve the demand of its customers i.e. it is operating at the lower risk. The mean ratio of SCBNL and NBBL are lower than HBL but seems satisfactory. On the basis of CV it can be conducted that the ratio of SCBNL and NBBL are more consistent than that of HBL.
- The mean ratio and CV of cash and bank balance to current assets ratio of HBL in higher. NBBL takes place after HBL. SCBNL is also satisfactory position and has more consistent on the ratios. The ability of HBL to make the quick payment of its customer deposits on the basis of its most liquid assets i.e. cash & bank balance is higher.
- The mean ratio & CV of investment in government securities to current assets ratio of SCBNL has been found higher and more consistent. SCBNL has better position, HBL has average and NBBL from the point of view of investment in government securities is poor.

**Shrestha (2010)**, has carried out a research work on the topic “*Impact of Investment on Economic Development*”. The main objective of this study attempts to assess the role and impact of investment on economic development of the country.

The main objectives of this study were as follows:

- To analyze the present position of commercial banks regarding investment policy.

- To analyze investment trend and their projection of selected commercial banks.
- To identify investment sector of selected commercial banks.
- To assess the impact of investment policy on performance.
- To make the suggestion, recommendation of the study.

### **Research Tools**

- Beta coefficient
- Systematic Risk
- Unsystematic Risk
- Portfolio Return
- Portfolio Standard Deviation

The major findings of this study were;

- Mean ratio of HBL investment to total commercial banks investment which is extremely higher than that of other banks to total commercial banks.
- NSBL has invested most of their fund in government securities than other banks. Likewise NIBL. HBL, SCBNL and NIBL has started to invest in other sector.
- All the banks has invested fewer funds to share and capital of other company. The commercial banks mostly invest on government securities, NRB bond and share and debentures of other company.
- The mean ratio of Investment of Total deposit of HBL is higher than other banks.
- BOKL has use its more fund on share and debenture of other companies than other banks. SCBNL which is less ratio of investment on share and debenture of other companies than other banks. It means SCBNL less invest its fund on share and debenture.
- Growth ratio of deposits of SCBNL which is higher than that other banks and HBL which is lower growth ratio of deposit. All the banks are increasing their deposit.

**Lamsal (2011)** has carried out a research work on the topic *“Mobilization of Deposit & Investment of Nabil Bank Limited”* The major objective of the study is to analyze

the deposit and investment position of NABIL bank and the other specific objectives were as follows.

- To explore the deposit and investment trend of NABIL.
- To assess the impact of interest rate on deposit collection by the NABIL.
- To examine the relationship between deposit and investment of NABIL.
- To compare the performance of deposit and investment of NABIL.

#### **Research tools**

- Beta coefficient
- Systematic Risk
- Unsystematic Risk
- Portfolio Return
- Portfolio Standard Deviation
- Correlation Coefficient

The major findings of this study were as follows.

- The current deposit, saving deposit, and margin deposit are in fluctuating trend over the study period and the call deposit and fixed deposit are in increasing trend over the study period.
- The total deposit of NABIL is in increasing trend
- Current deposit to total deposit ratio is in fluctuating trend and the saving deposit to total deposit ratio is in decreasing trend.
- The fixed deposit to total deposit ratio is in increasing trend.

**Sedai (2012)** The study on “*An analysis on lending policy and strength of Nepal Investment Bank Ltd*” highlighted that aggregate performance of NIBL is satisfactory and pushing upward.

The main objectives of this study were as follows:

- To analyze the deposit and lending policy of the bank.
- To assess the impact of investment/lending policy on performance.
- To evaluate the credit management policy of the bank.
- To make the suggestion, recommendation of the study.

## **Research Tools**

- Portfolio Return
- Portfolio Standard Deviation
- Correlation coefficient
- Trend analysis

The major findings of this study were as follows.

- Lending strength of NIBL in term of exposure of loan and advances is good and appreciable.
- The contribution made by bank in industrial as well as agriculture sector of the economy is highly appreciable and its bust up towards national prosperity.
- The ratio of loan and advances to total asset, loan and advance to shareholder's equity indicate a good performance of NIBL in its lending activities.
- Looking at the asset management ratio the performance of NIBL seems good in the area of lending, productivity and impact on national economy. The activity ratio also reflects to the soaring performance of NIBL.

**Burlakoti, (2012)** The study on “*Credit Policy Analysis of Commercial Bank with Special Reference to Everest Bank Limited*” has the main objective to find out the credit management position of Everest Bank Limited.

The main objectives of this study were as follows:

- To analyze the credit management practice of the bank.
- To assess the deposit and credit trend of the bank.
- To evaluate the credit management policy of the bank.
- To make the suggestion, recommendation of the study.

## **Research Tools**

- Correlation coefficient
- Trend analysis
- Growth ratio analysis

The major findings of this study were as follows.

- The study has concluded that Cash and bank balance to current deposit of the bank shows the fluctuating trend during the study period.
- Cash and balance to interest sensitive ratio of EBL is also in fluctuating trend. Credit and advance to fixed deposit ratio of EBL is fluctuating trend.
- Non-performing assets to total assets of EBL, is in declining trend. The debt to assets ratio of EBL is excessively high or in other words they have excessively geared capital structure.
- Return on loan and advances of EBL area also in fluctuating trend. This shows the normal earning capacity of EBL.

### **2.3 Research Gap**

Research gap refers to the gap between previous research and this research. Many research studies have been conducted by the different students, experts and researcher about credit management. There have been fund numerous research studies on financial companies and public enterprises regarding credit risk management. The financial and statistical tools used by most of the researchers were ratio analysis, test of hypothesis and regression analysis. This study includes different tools like ratio analysis, correlation analysis and co-efficient of variation, probable error, trend analysis as specific tools. Thus the research study made on "Credit risk management of commercial banks with refrence of HBL and NSBL " will be an effort to analyze on detail about credit management of the two commercial Banks. in present situation with the help of various related financial as well as statistical tools and techniques. The study can be beneficial to all the concerned parties and people as well.

The review of above relevant literature has contributed to enhance fundamental understanding and knowledge, which is required to make this study meaningful and purposive. There has been lots of article published related to investment policy, loan and advances of banks. There are various studies conducted on investment analysis and policy of banks, impact and implementation of NRB guidelines in banks. Thus, the previous studies cannot be ignored because they provide the foundation to the present study. In other words, there has to be continuity in research. This continuity in

studies is ensured by linking the present study with the past research studies. However, no one has done on “credit risk management in these sample Banks”.

The purpose of this study is to develop some expertise in one’s area, to see what new contribution can be made and to receive some ideas, knowledge and suggestions in relation to credit management of selected banks. To complete this study, many books, journals, articles and various published and unpublished dissertation are followed as guideline to make the research easier and smooth. To achieve this main objective, various financial and statistical tools are used. Therefore, this study is useful to the concerned bank as well as different persons, such as shareholders, investors, policy makers, stockbrokers, government etc.

## **CHAPTER- III**

### **RESEARCH METHODOLOGY**

Research methodology is the base for the study or it is a way toward the achievement of the stated objective of the study. Research methodology is the plan, structure and strategy of investigation conceived to answer the research question or test the research hypothesis (*Wolf & panta,1999:243*). Research methodology refers to the various methods of practices applied by the researcher in the entire aspect of the study.

Research methodology adopted in this chapter is the set of various instrumental approaches used in achieving the predetermined objectives as stated in the earlier chapter. It counts on the resources and techniques available and to the extent of their reliability and validity in this research. The research methodology adopted in this chapter follows some limited but crucial steps aimed to achieve the objective of research.

The main objective of this study is to make the comparative analysis of credit management of commercial banks with Nepal bank limited. In order to reach and accomplish the objectives of the study, different activities are carried out and different stages are crossed during the study period. For this purpose, the chapter aims to present and reflect the methods and techniques those are carried out and followed during the study period. The research methodology adapted for the present study is mentioned in this chapter which deals with research design, population and samples, 'mane and sources of data, procedure of data collection, processing and tabulation procedure and methodology.

#### **3.1 Research Design**

A research design is the arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. For the analysis of credit management of selected joint venture banks, analytical as well as descriptive designs applied to achieve the objective of the research.

Thus, a research design is a plan for the collection and analysis of data. It presents a series of guideposts for the researcher to progress in the right direction in order to achieve the goal. The design may be a specific presentation of the various steps in the problems, formulation of hypothesis, conceptual clarity, methodology, survey of literature and documentation, bibliography, data collection, testing of the hypothesis, interpretation, presentation and report writing. Generally, a common research design possesses the five basic elements viz. (i) selection of problem (ii) methodology (iii) data gathering (iv) data analysis and (v) report writing.

The research design asks, what approach to the problem should be taken, what methods will be used, what strategies will be used, what strategies will be effective etc. Identification, selection and formulation of a research problem may be considered as planning stage of a research and the remaining activities refer to the design, operation and completion of the research study.

A research design is the specification of methods and procedures of acquiring the information needed. It is the overall operational pattern of framework, of the project that stipulates what information is to be collected from which sources and what procedure. If it is a good design, it will ensure that the information obtained is relevant to the research questions and that it was collected objective and economical procedures. The research design adopted in this study is of descriptive type.

### **3.2 Sources of Data**

The researcher used two types of data collection techniques. One is primary data collection and other is secondary data collection.

#### **i. Primary Data**

Primary data are those collected by the researcher on the concerned topic, which are original in nature. While studying about the credit management, we came across primary data from different sources like: direct in-depth interviews with staffs of different Nepalese banks.

## **ii. Secondary Data**

Secondary data are those collected by the researcher on the concerned topic, which are not original in nature or are originally collected for some other purposes. The main sources of secondary data were: statistical publication of Nepal Rastra Bank, websites, annual reports of sample banks.

In some cases primary data are also taken as personal interview, face to face and telephone interview but the study is mainly based on secondary data. So, the major sources of secondary data for this study are as follows:

- Annual reports of the banks
- Published and unpublished bulletins, reports of the banks
- Published and unpublished bulletins, reports of the Nepal Stock Exchange
- Previous studies and reports
- Unpublished official records
- "Banking and Financial Statistics" report of Nepal Rastra Bank Magazines
- Journals and other published and unpublished related documents and reports for Central Library of T. U. and Library of Nepal Rastra Bank
- Various Internet Websites
- Other published materials etc.

### **3.3 Data Collection Procedure**

As the study will also be based on primary data, information will be collected developing a scheduled questionnaire and distributing these to employees of the banks and clients. Question of both, open-end and close-end will be included in questionnaire. Besides this, junior employees and clients are also being observed and responses have been drawn from them about relevant questionnaires.

### **3.4 Data Analysis Tools**

Mainly financial methods are applied for the purpose of this study. Appropriate statistical tools are also used. Among them correlation analysis regarded as major one is used for this research. To make the study more specific and reliable, the researcher uses two types of tool for analysis:

- i) Financial Tools and
- ii) Statistical Tools.

### 3.4.1 Statistical Tools

#### Arithmetic Mean

An arithmetic mean of a gain given set of observations is the sum of the observation divided by the number by the number of observations. In such a case all the items are equally important. Simple arithmetic mean is used in this study as per necessary for analysis.

We have,

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

Where,

$\sum X$  = Sum of all values of the observations.

n = Number of observations.

X = Values of variables.

#### Standard Deviation

The standard deviation is usually denoted by the letter sigma ( $\sigma$ ). It is a widely used measure of dispersion and is defined as the deviation of the observation from their arithmetic mean of a set of value. It is also known as root mean square deviation. Standard deviation in this study has been used to measure the degree of fluctuation of interest rate and that of other variables as per the necessity of the analysis.

We have,

$$\text{Standard Deviation}(\sigma) = \sqrt{\frac{\sum X^2}{N} - \left(\frac{\sum X}{N}\right)^2}$$

#### Coefficient of Variation (C.V)

The relative measure of dispersion based on standard deviation is called coefficient of standard deviation and 100 times coefficient of standard deviation is called coefficient of variation. It is denoted by C.V. Thus,

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

Where,

$\sigma$  = Standard deviation

$\bar{X}$  = Mean value of variables

Coefficient of variation being a pure number is independent of the units of measurement and thus is suitable for comparing the variability or uniformity of two or more distribution. The distribution having less C.V. is said to be less variable or more consistent or more stable. A distribution having greater C.V. is said to be more variable or less consistent or less stable. C.V. is used in this research for comparing the uniformity of variables of sample banks.

### **Correlation coefficient (r):**

Correlation may be defined as the degree of linear relationship existing between two or more variables. These variable are said to be correlated when the change in the value of one results change in another variable. Correlation is of three types. They are simple, partial and multiple correlations. Correlation may be positive, negative or zero. Correlation can be classified as linear or non-linear. Here, we study simple correlation only. In simple correlation, the effect of others is not included; rather these are taken as constant considering them to have no serious effect on the dependent variables.

The popular method of statistical tool, Karl Pearson's co-efficient of correlation has been adopted to measure the significance of the relation between the deposit and the investment, loan and advance of the four Joint Venture Banks. The formula for computing the correlation coefficient(r) using direct method is as follows:

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

Where,

N = Number of pairs of X and Y observed

X = Values of Investment, Loan and Advance

Y = Values of Total Deposit

r = co-efficient of correlation

### **Coefficient of Determination:**

The coefficient of determination is the measure of the degree of linear association or correlation between two or more independent variables. It measures the percentage total variation in dependent variables explained by independent variables. If  $R^2$  has a zero value then, it indicates that there is no correlation which means all the data points in scatter diagram fall exactly on the regression line. If it has the value equal to one then it indicates that there is perfect correlation and as such the regression line is the perfect estimator. But in most of the cases the value of  $R^2$  will lie somewhere between these two extremes of 1 and 0. One should remember that  $R^2$  close to one indicates a strong correlation between two variables and  $R^2$  near to zero means there is little correlation.

$$\text{Coefficient of Determination } (R^2) = \frac{\text{Explained variation}}{\text{Total Variation}}$$

$$\text{or, } R^2 = 1 - \frac{\text{Unexplained variation}}{\text{Total Variation}}$$

### **Probable Error**

The Probable Error (PE) of correlation coefficient is an old measure of testing of reliability of an observed correlation coefficient. The Probable Error of the correlation coefficient is the basis for the interpretation of its value.

PE is used in interpretation whether the calculated value of  $r$  is significant or not.

- If  $r < PE$  then it is insignificant or there is no evidence of correlation.
- If  $r > 6PE$  then, it is significant.
- If  $PE < r < 6PE$  then, nothing can be concluded.

### **3.4.2 Financial Tools**

#### **Ratio Analysis**

Ratio analysis is a powerful and the most widely used tool of financial analysis. A ratio defined as "The indicated quotient of two mathematical expression" and as the relationship between two or more things (*Webster's New Collection Dictionary, 1975: 958*).

A ratio is a figure or a percentage representing the comparison of one-dollar amount with some other dollar amount as a base (*Roy, 1974: 97*). Ratio analysis is a widely used tool of financial analysis. It is defined as the systematic use of ratio to interpret the financial statements so that the strength and weakness of a firm as well as its historical performance and current financial condition can be determined. In financial analysis a ratio is used as an index or yardstick for evaluating the financial position and performance of a firm. Ratio helps to summarize the large quantities of financial data and to make qualitative judgment about the firm's financial performance (*Pandey, 1979: 97*).

A large number of ratios can be generated from the components of profit and loss account and balance sheet. They are sound reasons for selecting different kinds of ratios for different types of situations. For this study, ratios are categorized into the following major headings:

**ii. Loans and Advances to Total Deposit Ratio**

$$= \frac{\text{Loan and advanced}}{\text{Total deposit}}$$

**iii. Non-performing Loan to Total Loans and advances Ratio**

$$= \frac{\text{Non-performing loan}}{\text{Total loans and advances}}$$

**iv. Loan Loss Provision to Non Performing Loan Ratio**

$$= \frac{\text{Loan loss provision}}{\text{Non performing loan}}$$

**V. Return on loan and advances ratio**

$$= \frac{\text{Return on loan}}{\text{Loan and advance}}$$

## **CHAPTER –IV**

### **DATA PRESENTATION AND ANALYSIS**

This chapter deals with the analysis and interpretation of data according to the research methodology to attain of the study. During analysis, data gathered from various sources have been inserted in tabular form. Using financial and statistical tools the data have been analyzed and they are used to evaluate the credit risk management of commercial banks.

With the help of analysis of ratio, credit risk has been analyzed and interpreted. So that, the strength and weakness of this organization and historical performance and present financial condition can be determined by this analysis. The financial tools included graphical presentation as well as trend analysis or regression analysis between some variables. The major variables like assets, liability, sales, debt, and equity are taken for the analysis. Moreover, the variables affecting to the financial performance is also considered in the study. The analysis is made through the data presentations and various financial tools reflecting the relationship among variables affecting credit risk.

#### **4.1 Financial analysis**

##### **4.1.1 Analysis of total deposit and investment**

The commercial banks may function when they have adequate deposits. Higher the volume of deposit, higher will be the volume of profit. So, a commercial bank first of all tries to collect the scattered deposits as much as possible. One of the main objectives of commercial bank is to safeguard the amount deposited by the general depositors and its mobilization in an effective manner.

Deposits are the main sources of resources to meet growing demands of financial existence. The existence of commercial banks basically depends upon the mobilization of deposits. It is important that commercial bank's deposit policy is the essential policy for its existence. The growth of bank depends primarily upon the growth of its deposit. The commercial banks may function well when they have

enough deposit. Higher the volume of deposit, higher will be the volume of lending and investment which again creates higher volume of profit.

$$\text{Investment deposit ratio} = \frac{\text{Total investment}}{\text{Total Deposit}}$$

**Table: 4.1**

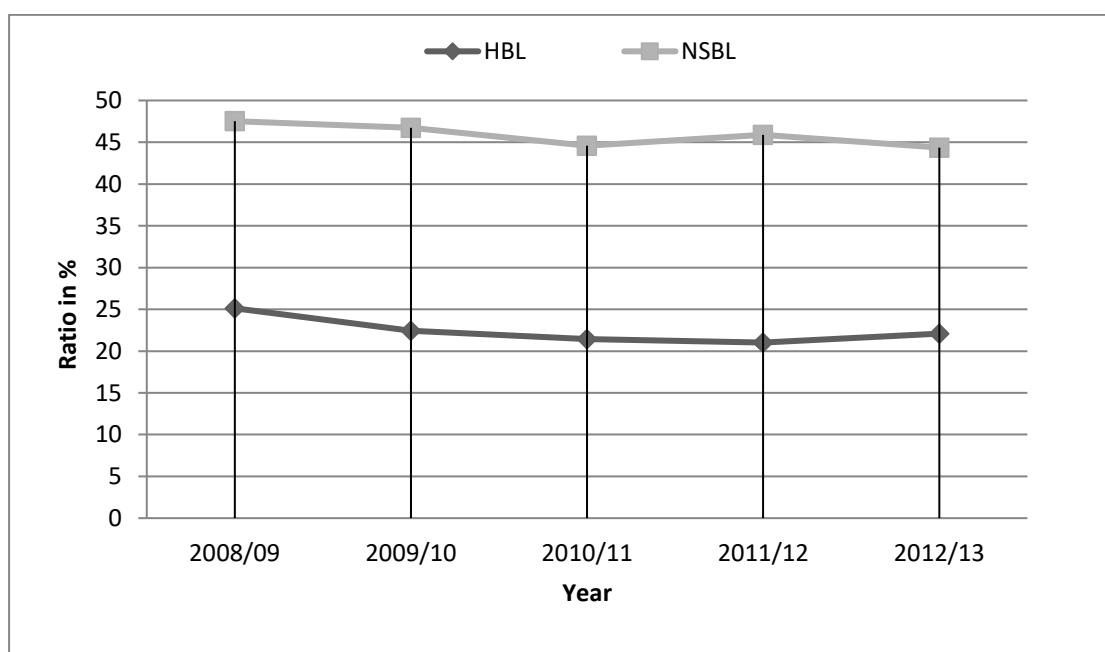
**Analysis of Total Deposit and Investment (Rs. In million)**

Year	HBL			NSBL		
	Investment	Total deposit	Ratio %	Investment	Total deposit	Ratio %
2008/09	8710.69	34681.35	25.12	13286.18	27957.22	47.52
2009/10	8444.91	37611.20	22.45	16305.63	34896.42	46.73
2010/11	8769.94	40920.63	21.43	18911.02	42415.44	44.58
2011/12	10031.58	47730.99	21.02	24463.45	53337.26	45.87
2012/13	11342.17	51320.02	22.10	27157.23	61217.53	44.36

(Source: Annual Report of HBL & NSBL)

**Figure: 4.1**

**Trend analysis of deposit and investment ratio**



(Source: Table No.4.1)

Table No. 4.1 and Figure 4.1 shows the deposit and investment position of HBL & NSBL. The total deposit of HBL in 2008/09 is Rs.34681.35 million. During the next five year the total deposit of HBL is increasing trend. Same while the deposit position of NSBL in fiscal year 2008/09 is Rs 27957.22 the trend of deposit of NSBL is increasing every year and it reaches Rs 61217.53 In the fiscal year 2012/013. Same while the total investment of HBL in fiscal year 2008/09 is Rs 8710.69 million and it is decrease in next year and again it is increase every year. The total investment of NSBL in fiscal year 2008/09 is Rs 13286.18 million and it is increasing every year. Investment deposit ratio of HBL is 25.12%, 22.45%, 21.43%, 21.02% and 22.10% in the five year period. It shows that 25.12% of total deposit is investment of HBL. And 47.52%, 46.73%, 44.585, 45.87%, and 44.36% of total deposit is investment of NSBL. From above figure comparison investment deposit ratio is high in NSBL.

#### 4.1.2 Analysis of Credit position

The total credit is the loan and advance and investment. Loan is the sum of the money that will be repay by the borrower. Investment is defined simply to be the sacrifice of current consumption for future consumption whose future objective is to increase future wealth. The general public gets attracted to take loan and advances from the bank if the interest rate is lower. The bank provides loan to the general public for different purposes like industry, trade, commerce etc.

**Table: 4.2**

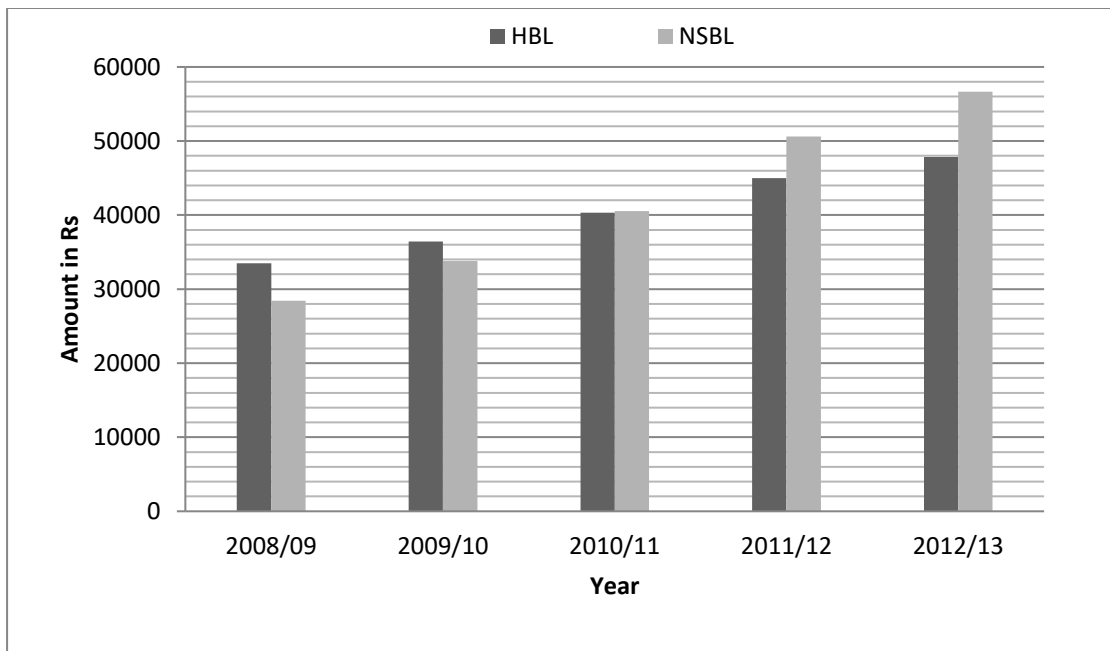
#### **Credit Position of HBL & NSBL**

Year	HBL			NSBL		
	Loan & Advance (a)	Investment (b)	Total Credit (a+b)	Loan & Advance (a)	Investment (b)	Total Credit (a+b)
2008/09	24793.16	8710.69	33503.85	15131.75	13286.18	28417.93
2009/10	27980.63	8444.91	36425.54	17480.55	16305.63	33786.18
2010/11	31566.98	8769.94	40336.92	21635.77	18911.02	40543.79
2011/12	34965.43	10031.58	44997.01	26142.09	24463.45	50605.54
2012/13	36512.57	11342.17	47854.74	29510.15	27157.23	56667.38

Source: Annual report of HBL & NSBL

**Figure: 4.2**

**Graphical presentation of Total credit**



**(Source: Table No. 4.2)**

Table No. 4.2 and figure No. 4.2 shows the overall loan & advance, investment and credit position of HBL and NSBL. The components of loan and advance, investment, and total credit is in increasing trend in during the five year period. In the year 2008/09 the loan and advance of HBL is Rs 24793.16 million and total credit is Rs 33503.85 million. Same while loan and advance, investment and total credit of NSBL is also increasing trend.

**4.2 Ratio Analysis**

Financial statements reports both on firms position at a point in time and on its operations over some past period. However, the real value of financial statements lies in the fact that can be used to help predict future earnings and dividends. From an investor`s standpoint, predicting is what financial statement analysis is useful is all about, while from management`s standpoint, financial statement analysis is useful both to help anticipative future conditions and, more important, as a starting point for planning actions that will improve the firm`s future performance.

#### 4.2.1 Loans and advances to Total deposit Ratio

Loan and advance consists of loans, advance, bills purchase and bills discounted. These are the major area of fund mobilization. The first part, Loans and Advances is more crucial and also bears more risk than Investments but also gives the higher return. Whereas, the second half, Investments has lesser risk and gives lower return in compare to Loans and Advances. Loans and Advances and Investment to Total deposit ratio indicate the firm's fund mobilizing power in gross. It is in calculated by following formula:

$$\text{Loan and advanced to total deposit ratio} = \frac{\text{Loan and advanced}}{\text{Total deposit}}$$

**Table: 4.3**

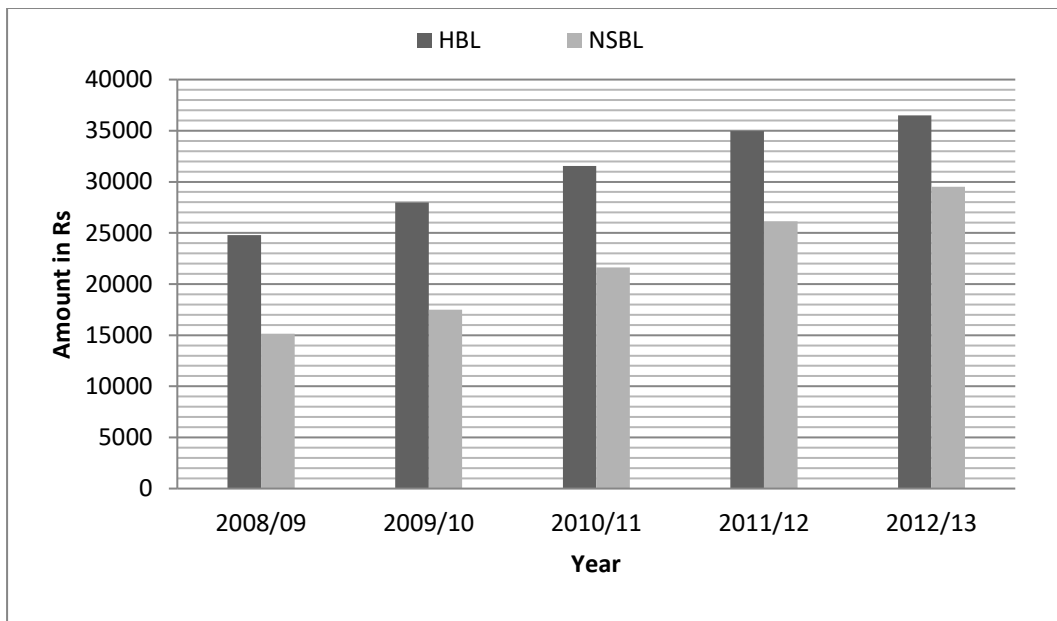
#### **Loan and advanced to total deposit ratio (Rs. In million)**

Year	HBL			NSBL		
	Loan and advances	Total deposit	%	Loan and advances	Total deposit	%
2008/09	24793.16	34681.35	71.49	15131.75	27957.22	54.12
2009/10	27980.63	37611.20	74.39	17480.55	34896.42	50.09
2010/11	31566.98	40920.63	77.14	21635.77	42415.44	51.01
2011/12	34965.43	47730.99	73.25	26142.09	53337.26	49.01
2012/13	36512.57	51320.02	71.15	29510.15	61217.53	48.21

Source: Annual report of HBL & NSBL

**Figure: 4.3**

**Graphical presentation of Loan and advances**



(Source: Table No. 4.3)

Table 4.3 and figure 4.3 shows the ratios of Loan and Advances to total deposit of HBL and NSBL. The ratios are ranged from 71.49%, 74.39%, 77.14%, 73.25% and 71.15% of fiscal year 2008/09 to 2012/13 of HBL. And the Loan and advanced to total deposit ratio of NSBL is 54.12%, 50.09%, 51.01%, 49.01% and 48.21% in the five year period. Analyzing the 5-year data of the two commercial banks, it is noted that the ratio of loan and advance to total deposit ratio is high degree of HBL bank.

**4.2.2 Non-performing Loan to Total Loan and advances Ratio**

Non-performing loan is one of the growing problems of the loan granting institution in Nepal. Due to unfair intention of the borrower and the frequently arising political and economic crises, non-performing loan has become major drawback of financial sector since a couple of years. Non-Performing Loan consists of Loans and Advances except for good loans. It is that part of Loans and Advances that should be looked upon carefully for the timely recollection of the repayments.

Non-performing Loan to Total Loan and advances Ratio:

$$= \frac{\text{Non-performing Loan}}{\text{Total loan and advances}}$$

**Table: 4.4**

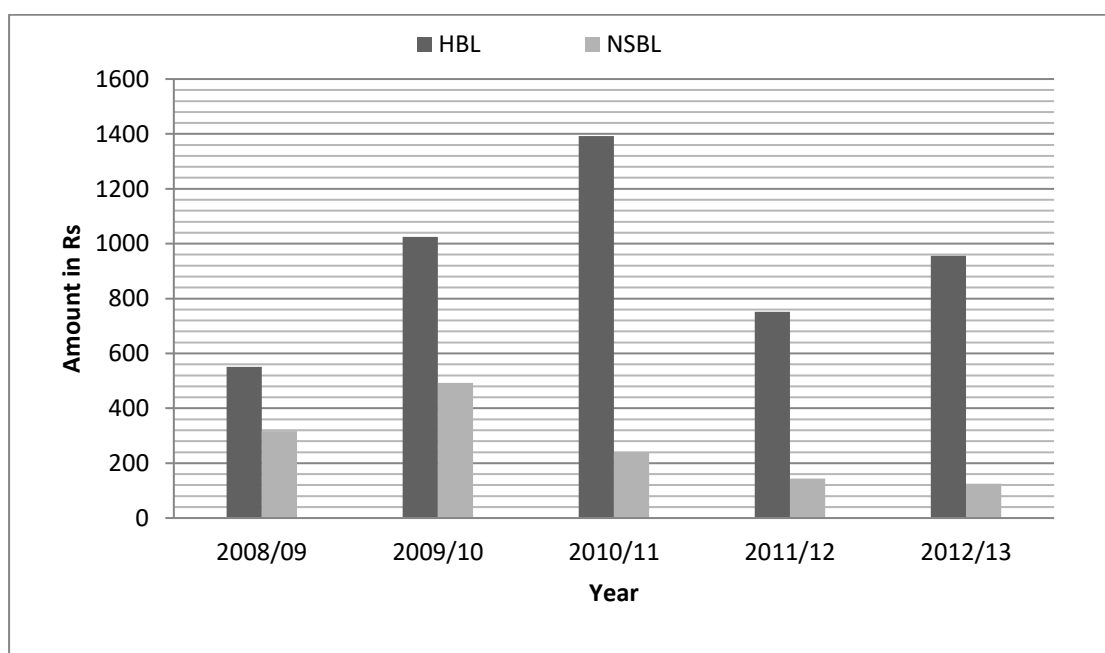
**Non-performing Loan to Total Loan and advances Ratio (Rs. In million)**

Year	HBL			NSBL		
	Non-performing loan	Total loan and advance	%	Non-performing loan	Total loan and advance	%
2008/09	551.31	24793.16	2.22	315.95	15131.75	2.01
2009/10	1024.83	27980.63	3.66	492.58	17480.55	2.82
2010/11	1391.75	31566.98	4.41	239.30	21635.77	1.11
2011/12	751.16	34965.43	2.15	143.85	26142.09	0.55
2012/13	956.23	36512.57	2.62	125.26	29510.15	0.42

Source: Annual report of HBL & NSBL

**Figure: 4.4**

**Graphical presentation of Non-performing loan**



(Source: Table No. 4.4)

Table 4.4 and figure 4.4 shows the ratios of non-performing loan to Loan and Advances of HBL and NSBL. Non-Performing Loan consists of Loans and Advances except for good loans. It is that part of Loans and Advances that should be looked upon carefully for the timely recollection of the repayments. The ratios are ranged

from 2.22%, 3.66%, 4.41%, 2.15% and 2.62% of fiscal year 2008/09 to 2012/13 of HBL. And the ratio of NSBL is 2.01%, 2.82%, 1.11%, .055% and 0.42% in the five year period. Analyzing the 5-year data of the two commercial banks, it is noted that the ratio of non-performing loan to total loan is high degree of HBL bank than NSBL. It shows that non performing loan is not so good for the banking performance.

#### 4.2.3 Non-Performing Loan to Loan Loss Provision Ratio

Loan Loss Provision shows the figure that is the summation of provision made against all types of loans as per the NRB directives. Provision include Pass loans, sub-standard loans, doubtful loans, and loss loans provision presented in the Profit & Loss Account and definitely, decreases the profit of the company. The more the Loan Loss Provision, it suggests two definite things, more of total loan and or more of loss loan. Since, according to the NRB directives, 1% provision is to be provided for all good loans too, it does acquire a huge portion of the total Loan Loss Provision. Thus, just by looking at mere Loan Loss Provision it cannot be said if the company has all good loans or voluminous bad loans.

Loan Loss Provision to Non Performing Loan Ratio:

$$= \frac{\text{Non performing loan}}{\text{loan loss ratio}}$$

**Table: 4.5**

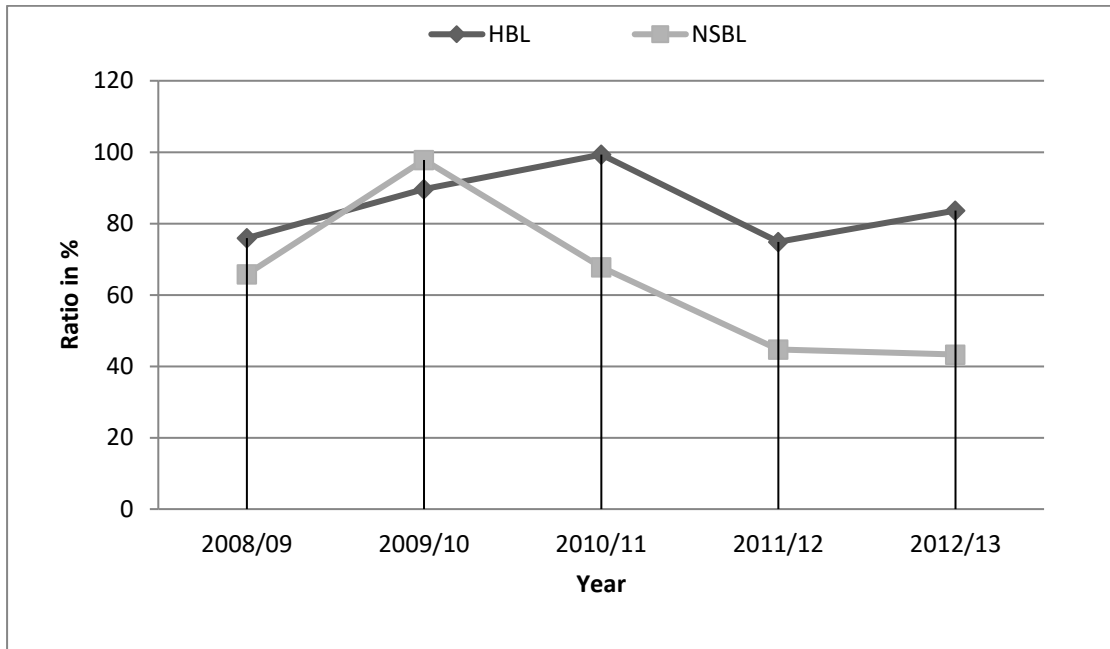
#### **Loan Loss Provision to Non Performing Loan Ratio (Rs. In million)**

Year	HBL			NSBL		
	Loan loss provision	Non-performing loan	Ratio %	Loan loss provision	Non-performing loan	Ratio %
2008/09	726.36	551.31	75.90	480.30	315.95	65.78
2009/10	1143.13	1024.83	89.65	483.09	472.58	97.82
2010/11	1401.29	1391.75	99.32	353.01	239.30	67.79
2011/12	1003.04	751.16	74.88	321.58	143.85	44.73
2012/13	1143.56	956.23	83.62	289.17	125.26	43.32

Source: Annual report of HBL & NSBL

Figure: 4.5

**Trend analysis of loss provision to Non-performing loan ratio**



(Source: Table No. 4.5)

Table 4.5 and figure 4.5 shows the ratios of non-performing loan to Loan loss provision of HBL and NSBL. Provision include Pass loans, sub-standard loans, doubtful loans, and loss loans provision presented in the Profit & Loss Account and definitely, decreases the profit of the company. The more the Loan Loss Provision, it suggests two definite things, more of total loan and or more of loss loan. The ratios are ranged from 75.90%, 89.65%, 99.32%, 74.88% and 83.62% of fiscal year 2008/09 to 2012/13 of HBL. And the ratio of NSBL is 65.78%, 97.82%, 67.79%, 44.73% and 43.32% in the five year period. Analyzing the 5-year data of the two commercial banks, it is noted that the ratio of loan loss provision to non-performing loan is high degree of HBL bank than NSBL.

**4.2.4 Interest Income to Interest Expenses Ratio**

The ratio of interest income to Interest Expenses measured the gap between interest rates offered and interest rate charged. The spread between the interest income and interest expenses is the main foundation for the profit of the bank. NRB had

restrictions on the interest rate spread of the commercial banks. The interest offered and the interest charged should not be more than 5 percent. The commercial banks are free to fixed interest rate on deposit and loans. Interest rate on all types of deposit and loans should be published in the local newspapers and communicated to NRB quarterly and immediately when revised. Deviation of 0.5 percent from the published rate is allowed on all types of loans and deposit. However with the new Financial Ordinance 2068 it has again empowered NRB to intervene in rate fixation but it does not specify the conditions that would oblige NRB to do so.

Interest income to interest expenses Ratio =

$$\frac{\text{Interest income}}{\text{Interest expenses}}$$

**Table: 4.6**

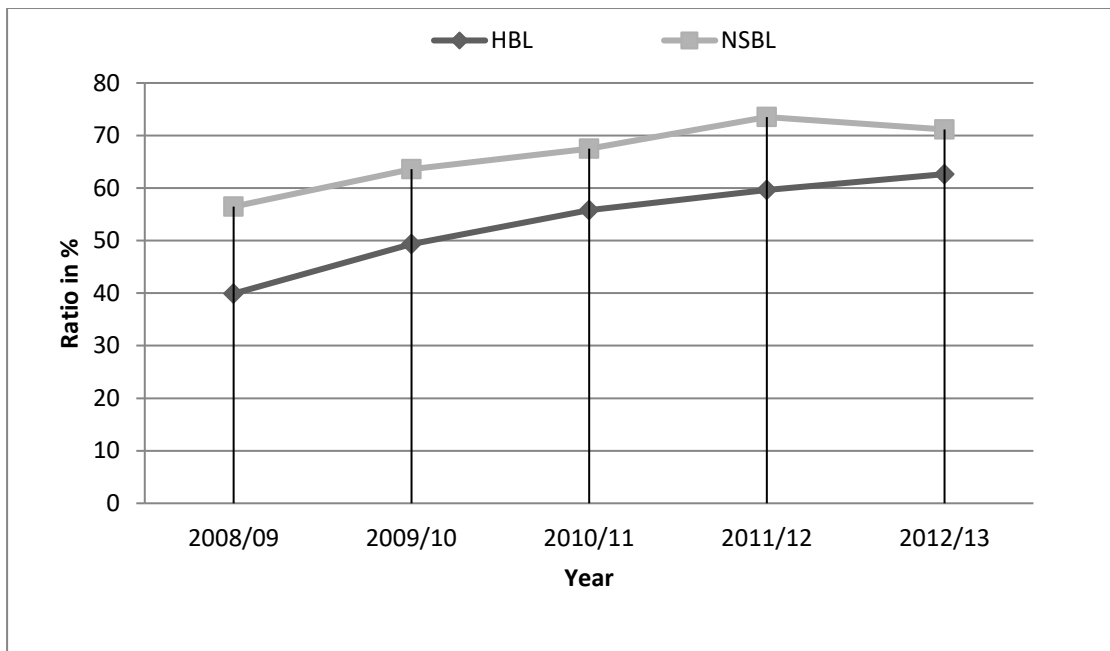
**Interest income to interest expenses Ratio (Rs. In million)**

Year	HBL			NSBL		
	Interest expenses	Interest income	Ratio %	Interest expenses	Interest income	Ratio %
2008/09	934.78	2342.20	39.91	824.70	1460.45	56.47
2009/10	1553.53	3148.61	49.34	1443.69	2269.70	63.61
2010/11	2414.81	4326.14	55.82	2096.04	3104.23	67.52
2011/12	2816.44	4724.89	59.61	2770.80	3769.48	73.51
2012/13	3217.56	5136.18	62.65	2957.34	4157.24	71.14

Source: Annual report of HBL & NSBL

**Figure: 4.6**

**Trend of interest income to interest expenses ratio**



**(Source: Table No. 4.6)**

The table 4.6 and figure 4.6 shows the interest expenses to interest income ratio of HBL and NSBL, the ratio of interest expenses to interest income rate of HBL is 39.91%, 49.34%, 55.82%, 59.61% and 62.65%. Same as interest income to interest expenses ratio of NSBL is 56.47%, 63.61%, 67.52, 73.51, 71.14%. from above table ratio shows that the interest income to expenses ratio is increasing trend of two sampled bank. It is shows that interest income is increasing both bank.

**4.2.5 Credit Deposit Ratio**

The total credit is the loan and advance and investment. Loan is the sum of the money that will be repay by the borrower. Investment is defined simply to be the sacrifice of current consumption for future consumption whose future objective is to increase future wealth.

$$\text{Credit deposit ratio (CD Ratio)} = \frac{\text{Total Credit}}{\text{Total Deposit}}$$

**Table: 4.7**

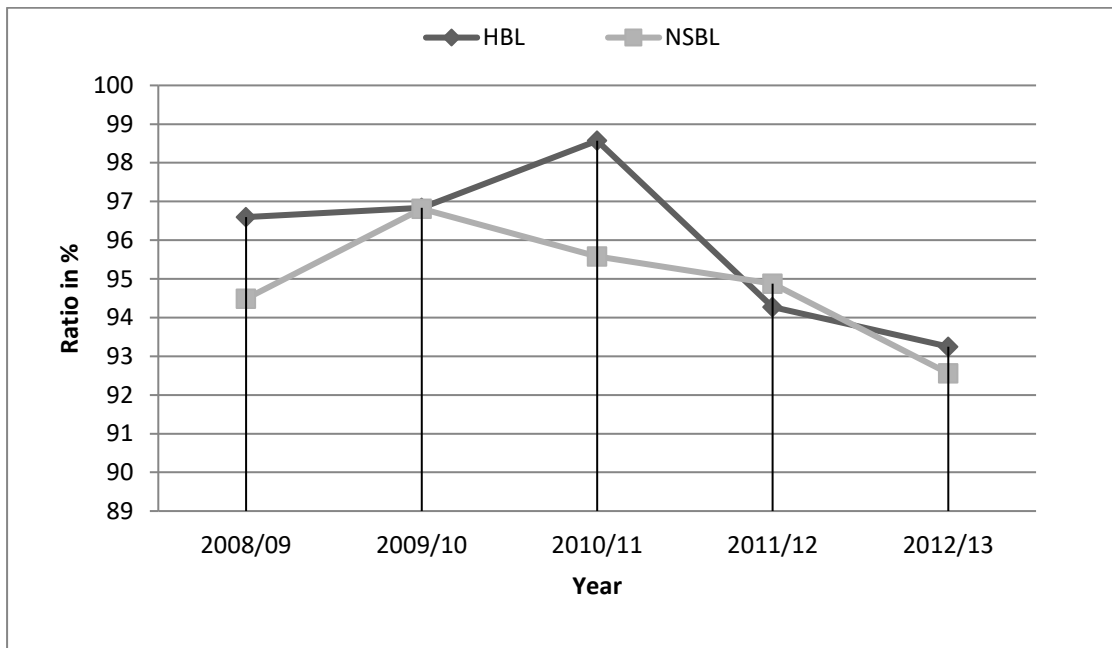
**Calculation of CD Ratio (Rs. In million)**

Year	HBL			NSBL		
	Total Credit	Total Deposit	Ratio %	Total Credit	Total Deposit	Ratio %
2008/09	33503.85	34681.35	96.60	26417.93	27957.22	94.49
2009/10	36425.54	37611.20	96.84	33786.18	34896.42	96.81
2010/11	40336.92	40920.63	98.57	40543.79	42415.44	95.58
2011/12	44997.01	47730.99	94.27	50605.54	53337.26	94.88
2012/13	47854.74	51320.02	93.25	56667.38	61217.53	92.56

Source: Annual report of HBL & NSBL

**Figure: 4.7**

**Trend of Credit deposit ratio**



(Source: Table No. 4.7)

Table 4.7 and figure 4.7 shows that the ratio of total deposit and total credit of HBL and NSBL, it can be said that there is a greater relationship between deposits and credit. Increase in deposits leads to increase in the loan and advance, but immense increase in the deposits leads to a little bit increase in loan and advance. The above

analysis shows that more than 96.60% of the deposited amount has been succeeded to mobilize the resources of HBL and 94.49 of deposit has been succeeded to mobilized of NSBL. Its satisfactory of the investment position of the bank.

### 4.3 Correlation Analysis

To find out the correlation between two continuous variables, Karl Pearson's coefficient of correlation ( $r$ ) is used. One of the very convenient and useful way of interpreting the value of coefficient of correlation ( $r$ ) between the two variables is coefficient of determination, which is denoted by  $r^2$ . It explains the total variation in dependent variable is explained by independent variable.

The significance of coefficient of correlation ( $r$ ) is tested with the help of 't' test. If calculated 't' is less than or equal to tabulated value of 't' it falls in the accepted region and null hypothesis is accepted or 'r' is not significant, if calculated 't' is greater than tabulated 't' null hypothesis is rejected or 'r' is significant of correlation in the population.

#### 4.3.1 Correlation between Deposit and Investment

Coefficient of correlation measures the degree of relationship between two variables, Total Deposit & Investment is independent variable ( $X_1$ ) and P is dependent variable ( $X_2$ ). The purpose of computing is to find out the relationship between Total deposit and investment is going to same direction or opposite direction.

**Table: 4.8**

#### **Relation between Deposit & Investment**

<b>Factor</b>	<b>Value</b>
Correlation ( $r$ )	0.9314
Coefficient of Determination ( $r^2$ )	0.8675
Calculated 't' Value	4.43
Tabulated 't' Value	2.201
Remarks	Significant

*Source: Appendix I*

The table 4.8 describes the relationship between total deposit and investment of HBL, during the period of the study the coefficient of correlation ( $r$ ) between total deposit and investment is 0.9314. This figure shows the positive association between total deposit and investment. It means total deposit and investment both move towards same direction. The coefficient of determination ( $r^2$ ) is 0.8675. It shows that 86.75% of the variation in the dependent variable (i.e. deposit) is explained by the independent variable (i.e. investment). The calculated value of 't' is more than the tabulated value of 't' (i.e.  $4.43 > 2.201$ ) therefore true value of 'r' is significant. It reveals that there is significant relationship between the total deposit and investment.

### 4.3.2 Correlation between loan & advances and deposit

Coefficient of correlation measures the degree of relationship between two variables, loan & advances and deposit. Total deposit is independent variable ( $X_1$ ) and loan and advances is dependent variable ( $X_2$ ). The purpose of computing is to find out the relationship between loan & advances and deposit.

**Table: 4.9**

#### **Relation between loan & advances and deposit**

<b>Factor</b>	<b>Value</b>
Correlation ( $r$ )	0.9796
Coefficient of Determination ( $r^2$ )	0.9597
Calculated 't' Value	8.45
Tabulated 't' Value	2.201
Remarks	Significant

*Source: Appendix II*

Table 4.9 describes the relationship between total deposit and loan and advances of HBL, during the period of the study the coefficient of correlation ( $r$ ) between total deposit and loan and advances is 0.9796. This figure shows the positive association between total deposit and loan and advances. It means total deposit and loan and advances both move towards same direction. The coefficient of determination ( $r^2$ ) is 0.9597 It shows that 95.97% of the variation in the dependent variable (i.e. deposit) is explained by the independent variable (i.e. loan and advances). The calculated value

of 't' is more than the tabulated value of 't' (i.e.  $8.45 > 2.201$ ) therefore true value of 'r' is significant. It reveals that there is significant relationship between the total deposit and loan and advances.

### 4.3.3 Correlation between loan loss provision and non performing loan

Coefficient of correlation measures the degree of relationship between two variables, loan loss provision & non performing loan.

**Table: 4.10**

**Relation between loan loss provision and non performing loan**

<b>Factor</b>	<b>Value</b>
Correlation (r)	0.9777
Coefficient of Determination ( $r^2$ )	0.559
Calculated 't' Value	8.07
Tabulated 't' Value	2.201
Remarks	Significant

*Source: Appendix III*

Table 4.10 describes the relationship between loan loss provision and non performing loan of HBL, during the period of the study the coefficient of correlation (r) between loan loss provision and non performing loan is 0.9777. This figure shows the positive association between loan loss provision and non performing loan. It means loan loss provision and non performing loan both move towards same direction. The coefficient of determination ( $r^2$ ) is 0.559. It shows that 55.9% of the variation in the dependent variable (i.e. loan loss provision) is explained by the independent variable (i.e. non performing loan). The calculated value of 't' is more than the tabulated value of 't' (i.e.  $8.07 > 2.201$ ) therefore true value of 'r' is significant. It reveals that there is significant relationship between the loan loss provision and non performing loan.

## 4.4 Trend Analysis

### 4.4.1 Trend Analysis of credit of HBL

The trend analysis of total credit shows the trend value and actual value of credit of HBL for the fiscal year 2008 to 2013 and forecast the sales for next 5 years are given in the following table.

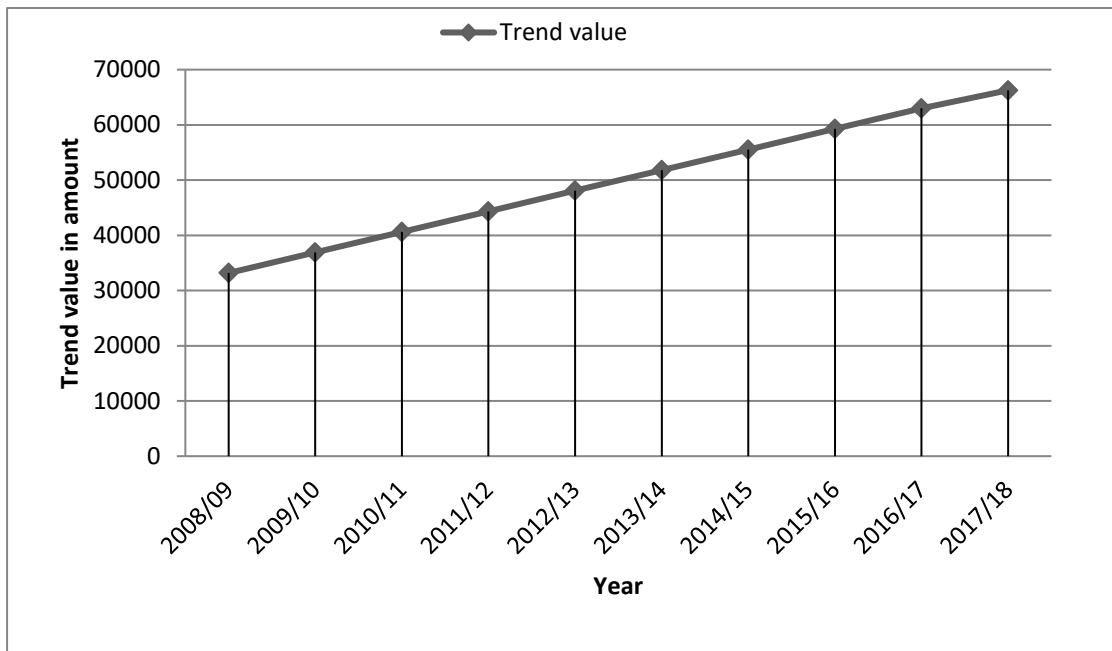
**Table: 4.11**  
**Trend Volume & Actual Volume of Credit**

<b>Fiscal year</b>	<b>Actual value</b>	<b>Trend value</b>
2008/09	33503.85	33168.95
2009/10	36425.54	36896.28
2010/11	40336.92	40623.61
2011/12	44997.01	44350.94
2012/13	47854.74	48078.27
2013/14	-	51805.60
2014/15	-	55532.93
2015/16	-	59260.26
2016/17	-	62987.59
2017/18	-	66259.92
Mean (a)	40623.61	
Rate of Change (b)	3727.33	
Trend Line (y)	$Y = 40623.61 + 3727.33X$	

*Source: Appendix-IV*

**Figure: 4.8**

**Trend of line of credit of HBL**



(Source: Table No. 4.11)

The table 4.11 and figure 4.8 shows that the increasing trend of Credit. Since, the calculated value of 'b' is positive it is found that the HBL total credit is increasing with time.

**4.4.2 Trend Analysis of credit of NSBL**

The trend analysis of total credit shows the trend value and actual value of credit of NSBL for the fiscal year 2008 to 2013 and forecast the sales for next 5 years are given in the following table.

**Table: 4.12**

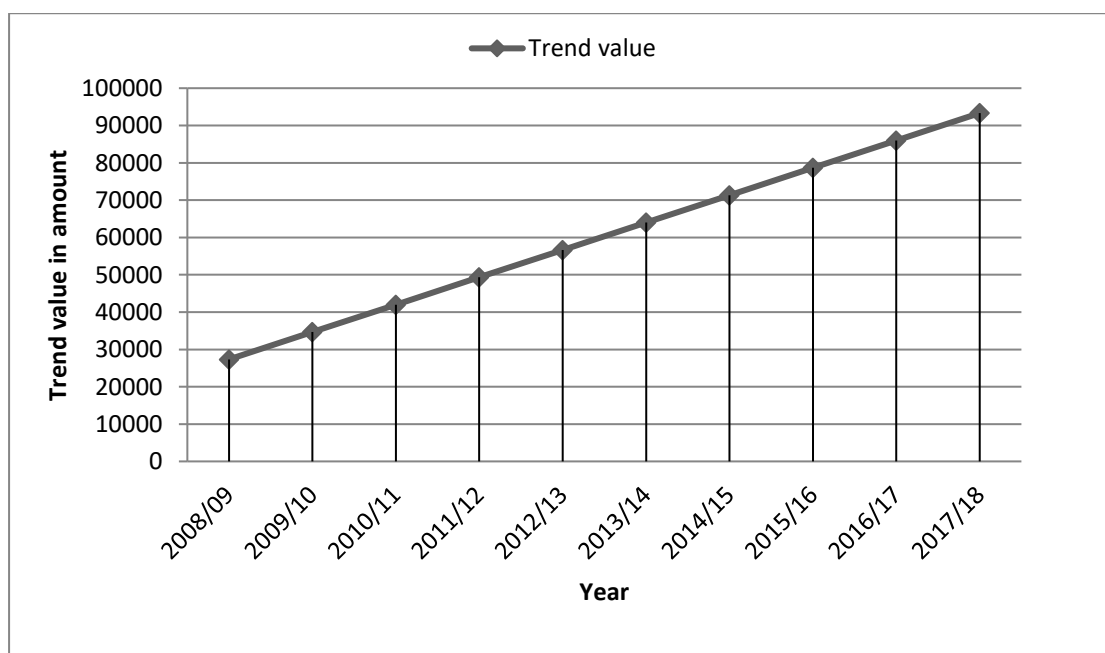
**Trend Volume & Actual Volume of Credit**

Fiscal year	Actual value	Trend value
2008/09	28417.93	27340.5
2009/10	33786.18	34672.33
2010/11	40543.79	42004.16
2011/12	50605.54	49335.99
2012/13	56667.38	56667.82
2013/14		63999.65
2014/15		71331.48
2015/16		78663.31
2016/17		85995.14
2017/18		93326.97
Mean (a)	42004.16	
Rate of Change (b)	7331.83	
Trend Line (y)	$Y = 42004.16 + 7331.83X$	

Source: Appendix-V

**Figure: 4.9**

**Trend of line of credit of NSBL**



(Source: Table No. 4.12)

The table 4.12 and figure 4.9 shows that the increasing trend of total credit of NSBL. Since, the calculated value of 'b' is positive it is found that the NSBL Credit is increasing with time.

#### 4.5 Major findings

- Table 4.1 and Figure 4.1 shows the deposit and investment position of HBL & NSBL. The total deposit of HBL in 2008/09 is Rs.34681.35 million. During the next five year the total deposit of HBL is increasing trend. Same while the deposit position of NSBL in fiscal year 2008/09 is Rs 27957.22 the trend of deposit of NSBL is increasing every year and it reaches Rs 61217.53 In the fiscal year 2012/013. Same while the total investment of HBL in fiscal year 2008/09 is Rs 8710.69 million and it is decrease in next year and again it is increase every year.
- The total investment of NSBL in fiscal year 2008/09 is Rs 13286.18 million and it is increasing every year. Investment deposit ratio of HBL is 25.12%, 22.45%, 21.43%, 21.02% and 22.10% in the five year period. It shows that 25.12% of total deposit is investment of HBL. And 47.52%, 46.73%, 44.585, 45.87%, and 44.36% of total deposit is investment of NSBL. From above figure comparison investment deposit ratio is high in NSBL.
- Table 4.2 and figure 4.2 shows the overall loan & advance, investment and credit position of HBL and NSBL. The components of loan and advance, investment, and total credit is in increasing trend in during the five year period. In the year 2008/09 the loan and advance of HBL is Rs 24793.16 million and total credit is Rs 33503.85 million. Same while loan and advance, investment and total credit of NSBL is also increasing trend.
- Table 4.3 and figure 4.3 shows the ratios of Loan and Advances to total deposit of HBL and NSBL. The ratios are ranged from 71.49%, 74.39%, 77.14%, 73.25% and 71.15% of fiscal year 2008/09 to 2012/13 of HBL.
- And the Loan and advanced to total deposit ratio of NSBL is 54.12%, 50.09%, 51.01%, 49.01% and 48.21% in the five year period. Analyzing the 5-year data of the two commercial banks, it is noted that the ratio of loan and advance to total deposit ratio is high degree of HBL bank.

- Table 4.4 and figure 4.4 shows the ratios of non-performing loan to Loan and Advances of HBL and NSBL. Non-Performing Loan consists of Loans and Advances except for good loans. It is that part of Loans and Advances that should be looked upon carefully for the timely recollection of the repayments.
- The ratios are ranged from 2.22%, 3.66%, 4.41%, 2.15% and 2.62% of fiscal year 2008/09 to 2012/13 of HBL. And the ratio of NSBL is 2.01%, 2.82%, 1.11%, .055% and 0.42% in the five year period. Analyzing the 5-year data of the two commercial banks, it is noted that the ratio of non-performing loan to total loan is high degree of HBL bank than NSBL. It shows that non performing loan is not so good for the banking performance.
- Table 4.5 and figure 4.5 shows the ratios of non-performing loan to Loan loss provision of HBL and NSBL. Provision include Pass loans, sub-standard loans, doubtful loans, and loss loans provision presented in the Profit & Loss Account and definitely, decreases the profit of the company.
- The more the Loan Loss Provision, it suggests two definite things, more of total loan and or more of loss loan. The ratios are ranged from 75.90%, 89.65%, 99.32%, 74.88% and 83.62% of fiscal year 2008/09 to 2012/13 of HBL. And the ratio of NSBL is 65.78%, 97.82%, 67.79%, 44.73% and 43.32% in the five year period. Analyzing the 5-year data of the two commercial banks, it is noted that the ratio of loan loss provision to non-performing loan is high degree of HBL bank than NSBL.
- Table 4.6 and Figure 4.6 shows the interest expenses to interest income ratio of HBL and NSBL, the ratio of interest expenses to interest income rate of HBL is 39.91%, 49.34%, 55.82%, 59.61% and 62.65%. Same as interest income to interest expenses ratio of NSBL is 56.47%, 63.61%, 67.52, 73.51, 71.14%. From table 4.6 ratio shows that the interest income to expenses ratio is increasing trend of two sampled bank. It is shows that interest income is increasing both bank.
- Table 4.7 and figure 4.7 shows that the ratio of total deposit and total credit of HBL and NSBL, it can be said that there is a greater relationship between deposits and credit. Increase in deposits leads to increase in the loan and advance, but immense increase in the deposits leads to a little bit increase in loan and advance. The above analysis shows that more than 96.60% of the

deposited amount has been succeeded to mobilize the resources of HBL and 94.49 of deposit has been succeeded to mobilized of NSBL. Its satisfactory of the investment position of the bank.

- Table 4.8 describes the relationship between total deposit and investment of HBL, during the period of the study the coefficient of correlation ( $r$ ) between total deposit and investment is 0.9314. This figure shows the positive association between total deposit and investment. It means total deposit and investment both move towards same direction.
- The coefficient of determination ( $r^2$ ) is 0.8675. It shows that 86.75% of the variation in the dependent variable (i.e. deposit) is explained by the independent variable (i.e. investment). The calculated value of 't' is more than the tabulated value of 't' (i.e.  $4.43 > 2.201$ ) therefore true value of 'r' is significant. It reveals that there is significant relationship between the total deposit and investment.
- Table 4.9 describes the relationship between total deposit and loan and advances of HBL, during the period of the study the coefficient of correlation ( $r$ ) between total deposit and loan and advances is 0.9796. This figure shows the positive association between total deposit and loan and advances. It means total deposit and loan and advances both move towards same direction.
- The coefficient of determination ( $r^2$ ) is 0.9597 It shows that 95.97% of the variation in the dependent variable (i.e. deposit) is explained by the independent variable (i.e. loan and advances). The calculated value of 't' is more than the tabulated value of 't' (i.e.  $8.45 > 2.201$ ) therefore true value of 'r' is significant. It reveals that there is significant relationship between the total deposit and loan and advances.
- Table 4.10 describes the relationship between loan loss provision and non performing loan of HBL, during the period of the study the coefficient of correlation ( $r$ ) between loan loss provision and non performing loan is 0.9777. This figure shows the positive association between loan loss provision and non performing loan. It means loan loss provision and non performing loan both move towards same direction.

- The coefficient of determination ( $r^2$ ) is 0.559. It shows that 55.9% of the variation in the dependent variable (i.e. loan loss provision) is explained by the independent variable (i.e. non performing loan). The calculated value of 't' is more than the tabulated value of 't' (i.e.  $8.07 > 2.201$ ) therefore true value of 'r' is significant. It reveals that there is significant relationship between the loan loss provision and non performing loan.
- Table 4.11 and figure 4.8 shows that the increasing trend of Credit. Since, the calculated value of 'b' is positive it is found that the HBL total credit is increasing with time.
- Table 4.12 and figure 4.9 shows that the increasing trend of total credit of NSBL. Since, the calculated value of 'b' is positive it is found that the NSBL Credit is increasing with time.

## **CHAPTER – V**

### **SUMMARY, CONCLUSION & RECOMMENDATION**

In this chapter, summary and conclusion of the research as well as recommendations are presented separately. After summarizing and concluding the research, recommendations are suggested for the credit risk management of Nepalese Commercial Banks. The researcher has tried to give suggestions and recommendations to the commercial banks based on this research.

#### **5.1 Summary**

The problem of economic development of a developing country is a problem of real growth. Only considering real factor can't solve this problem, because, nowadays financial and monitoring factors have a tremendous effect on the growth process. For the development of the country's economy, sound and co-ordinate fiscal and monetary policy plays an important role even in underdeveloped country like Nepal. For this, the role of commercial banks becomes crucial in the task of capital formation, which is, no doubt, a key variable in the economic development of a country. Scattered resources hold no meaning unless and until they are mobilize and utilize efficiently in some productive sectors.

The development and expansion of financial institution is essential for economic growth of the country. JVBs are such financial institutions which collect funds from depositors and mobilize its fund as loan and advances according to the need of client. A term credit plays a vital role in the economy. Better management of the credit is essential to make high return for every JVBs. JVBs want to maximize return and minimize credit risk. Credit management strongly recommends analyzing and managing the credit risk. When borrower will fail to meet its obligation in accordance with the agreed terms and conditions, then credit risk problem is arises. So, to minimize such risk, all JVBs should have to establish and use standards in making credit decisions. Loans are risky assets though a bank invests most of its resources in granting loan and advances. The loan provided by JVBs in different sector contributes to the society and whole economy, because credit function is the demand of economy but sometimes credit becomes dangerous tool if it is properly managed and controlled. Too much and too little credit is harmful. Too much credit leads to inflation which

causes direct and immediate damage to creditors and customers and too little credit lead to deflation which brings down the level of output, employment and income. So, the directives stipulated by NRB for JVBs become essential to manage credit in proper way and playing great role of the comparative analysis of credit management of JVBs. The researcher has identified the research problem of two JVBs. The objectives which are determined on the basis of research problem. In order to carry out this study, the secondary sources of data have been used. The analysis is performed with the help of financial and statistical tools. The presentation and analysis of data provides the clear picture in terms of financial strength and weakness of these JVBs. The analysis is associated with comparison and interpretation. Various financial ratios of two commercial banks.

The findings were drawn analysis the five years data of above mentioned commercial banks. Different ratios were calculated to get the results for conclusions. Since the topic of the study revolves around the lending practices, the distribution of loans and advances, their recovery, and the ratios of those items that are related to the distribution and recovery of loans and advances are calculated.

## **5.2 Conclusion**

The measurement of Lending strength in relative terms has revealed that NSBL has the highest Investment to Loans and Advances and Investment ratio. This ratio gives the portion of risk free investment out of total Loans and Advances and Investment. HBL has the highest Loans and Advances and Investment to Total Deposit ratio referring that it has the maximum mobilization of deposits than others.

The measurement of efficiency in Lending has revealed that Loan Loss Provision to Total Loan & Advances Ratio is pretty satisfactory since according to NRB directives Loan Loss Provision indicates provision against both Performing and Non-Performing Loans. Thus, even the increase in good loan increases the Loan Loss Provision.

There is no uniformity in correlation of two variables in different commercial banks. High degree of positive correlation indicates good performance. One of the banks has negative correlation between investments and Loans and Advances probably because unavailability of good lending opportunities results in increase in Investment and vice versa.

Qualitative analysis of Recovery of Loan has revealed the practical problems in collection of mobilized loans and Advances. Once the loan is given, it's more like the company has to, literally chase the borrower to recover its investment. It's probably is the lack of government support, from the regulations it makes, that the borrower normally dominates the bank, provided that the borrower is a known of the regulations such that he can manipulate it to his benefit. Liquidation of collateral, as regarded as security against the loan advanced, is one very tedious job. Realization of default loan via the liquidation of collateral does not turn out to be as simple as it sounds. The most distributing part is that there is no such directive regarding recovery of loans. It was said that the directives regarding recovery of loans were made but is not circulated till date.

### **5.3 Recommendation**

Based on the conclusions, the following recommendations have been forwarded: -

- Investment to Loans and Advances mean ratio of HBL and NSBL are below the combined mean. Investment in risk-free assets is also important. Though flows of loans in riskier assets are quite profit some default of those loans will make the company hard to sustain for a longer period of time.
- Investment in risk-free and riskier asset should go hand in hand. Thus, HBL and NSBL should increase in their risk free assets at least to the combined mean.
- In overall, Loans and Advances of sample banks are increasing and so are Non-Performing Loans and Loan Loss Provision. HBL however is working over this but it still is not sufficient. Similarly, HBL and NSBL also need to control these variables.

- All the commercial banks have increasing Loan Loss Provision; it may be because there is provision of maintaining 1% Loan loss provision for the “Pass” loan too. According to NRB Directives the loans which exceed the due period of more than three months is considered as non-performing loan.
- The new loans are likely to be categorized as non-performing loans in short span of time of mere three months. All the banks should take extra care for not increasing the non-performing loans. They should be in high alert and should be well known about the due period of the loans so they can inform their clients through different medium (letters, phone calls, personal meeting etc.) in advance.
- This helps a lot in maintaining the sound position of the institution. Moreover, every bank should try to collect its new as well as old loans. Collection of more of the non-performing loans helps the institution to reduce the amount of loan loss provision.
- HBL has the highest loans and advances and investment to Total Deposit referring that it has the highest mobilization of deposits whereas NSBL has the least ratio. Every bank is required to maintain certain percentage of liquidity as per the directives given by the NRB. They should not forget the level of liquidity required to be maintained before flowing of loans. There is punishment by NRB for violating the rules directed by NRB.
- The banks are suggested that they keep track of their authorized quota to invest in specific loan category else there is provision of punishment according to the NRB Directives. According to the directives of NRB, bank can invest only 40% of total loan in hire purchase else they have to make provision of 25% of the excess volume. Considering the most years data of all the selected banks all are in line with the directives provided. Commercial banks have been mending the over investment but still in previous years.
- The ratio of Interest expenses to Total Interest Income from loans and Advances mean ratio is highest of NSBL. So, this figure is not so bad however, all banks especially NSBL should try to control it. High Interest Suspense decreases the profits of the company. All three banks are also

recommended on concentrating in collecting their installment payments timely.

- Increase in loan loss provision decreases the profit result. If high loan loss is expected, greater loan loss provision is made in income statement and this will lead to low profit and possible losses .If loan are not distributed properly and cautiously then it may be main cause of the failure of the banks. So these banks are recommended to adopt sound credit collection policy. It helps them to decrease loan loss provision and non performing loan. So these banks must be careful in strengthen credit collection policy.

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[www.hbl.com.np](http://www.hbl.com.np)

[www.nrb.org.np](http://www.nrb.org.np)

## Appendix I

### Calculation of Correlation between Total deposit & investment

Year	Investment (X <sub>1</sub> )	Deposit (X <sub>2</sub> )	x <sub>1</sub> =X <sub>1</sub> - $\bar{x}_1$	x <sub>2</sub> =X <sub>2</sub> - $\bar{x}_2$	x <sub>1</sub> · x <sub>2</sub>	x <sub>1</sub> <sup>2</sup>	x <sub>2</sub> <sup>2</sup>
2008/09	8710.69	34681.35	-749.17	-7,771.5	5,822,150.12	561,252.69	60,396,025.7
2009/10	8444.91	37611.2	-1,014.95	-4,841.6	4,914,010.80	1,030,119.44	23,441,458.5
2010/11	8,769.94	40920.63	-689.92	-1,532.2	1,057,097.88	475,986.85	2,347,661.4
2011/12	10,031.58	47,730.99	571.72	5,278.15	3,017,635.62	326,866.05	27,858,888.5
2012/13	11,342.17	51,320.02	1,882.31	8,867.18	16,690,803.08	3,543,098.47	78,626,916.6
<b>N<sub>1</sub> = 5,</b>	<b>∑ X<sub>1</sub> =</b>	<b>∑ X<sub>2</sub> =</b>			<b>∑ x<sub>1</sub>·x<sub>2</sub> =</b>	<b>∑ x<sub>1</sub><sup>2</sup>=</b>	<b>∑ x<sub>2</sub><sup>2</sup></b>
<b>N<sub>2</sub> = 5</b>	<b>47299.29</b>	<b>212264.19</b>			<b>31501697.51</b>	<b>5937323.49</b>	<b>192670950.7</b>

Correlation between Investment and deposit,

$$(r_{12}) = \frac{\sum x_1 x_2}{\sqrt{\sum x_1^2 \sum x_2^2}}$$

$$= \frac{31501697.51}{\sqrt{5937323.49 \times 192670950.7}} = 0.9314$$

$$r^2 = 0.8675$$

T-value,

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

$$= \frac{0.9314}{\sqrt{1-0.8675}} \times \sqrt{5-2} = 4.43$$

## Appendix II

### Calculation of Correlation between Total deposit & Loan & advances of HBL & NSBL

Year	Loan & adv (X <sub>1</sub> )	Deposit (X <sub>2</sub> )	x <sub>1</sub> =X <sub>1</sub> - $\bar{x}_1$	x <sub>2</sub> =X <sub>2</sub> - $\bar{x}_2$	x <sub>1</sub> . x <sub>2</sub>	x <sub>1</sub> <sup>2</sup>	x <sub>2</sub> <sup>2</sup>
2008/09	24793.16	34681.35	-6,370.6	-7,771.5	49,508,994.82	40,584,467.91	60,396,025.73
2009/10	27980.63	37611.2	-3,183.1	-4,841.6	15,411,534.12	10,132,278.40	23,441,458.52
2010/11	31,566.98	40920.63	403.23	-1,532.2	-617,826.10	162,591.21	2,347,661.36
2011/12	34,965.43	47,730.99	3,801.68	5,278.15	20,065,823.78	14,452,740.41	27,858,888.54
2012/13	36,512.57	51,320.02	5,348.82	8,867.18	47,428,924.96	28,609,832.60	78,626,916.62
<b>N<sub>1</sub> = 5,</b>	<b>∑ X<sub>1</sub> =</b>	<b>∑ X<sub>2</sub> =</b>			<b>∑ x<sub>1</sub>.x<sub>2</sub> =</b>	<b>∑ x<sub>1</sub><sup>2</sup>=</b>	<b>∑ x<sub>2</sub><sup>2</sup></b>
<b>N<sub>2</sub> = 5</b>	<b>155818.77</b>	<b>212264.19</b>			<b>131797451.58</b>	<b>93941910.53</b>	<b>192670950.77</b>

Correlation between loan & advances and deposit,

$$\begin{aligned}
 (r_{12}) &= \frac{\sum x_1 x_2}{\sqrt{\sum x_1^2 \sum x_2^2}} \\
 &= \frac{131797451.58}{\sqrt{93941910.53 \times 192670950.77}} = 0.9796 \\
 r^2 &= 0.9597
 \end{aligned}$$

T-value,

$$\begin{aligned}
 t &= \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2} \\
 &= \frac{0.9796}{\sqrt{1-0.9597}} \times \sqrt{5-2} = 8.45
 \end{aligned}$$

### Appendix III

#### Calculation of Correlation between loan loss provision and non performing loan

Year	Loan loss (X <sub>1</sub> )	NP Loan (X <sub>2</sub> )	x <sub>1</sub> =X <sub>1</sub> - $\bar{X}_1$	x <sub>2</sub> =X <sub>2</sub> - $\bar{X}_2$	x <sub>1</sub> · x <sub>2</sub>	x <sub>1</sub> <sup>2</sup>	x <sub>2</sub> <sup>2</sup>
2008/09	726.36	551.31	-357.12	-383.75	137,041.84	127,531.84	147,260.99
2009/10	1143.13	1024.83	59.65	89.77	5,355.38	3,558.60	8,059.37
2010/11	1,401.29	1391.75	317.81	456.69	145,143.75	101,005.74	208,569.41
2011/12	1,003.04	751.16	-80.44	-183.90	14,791.86	6,469.95	33,817.74
2012/13	1,143.56	956.23	60.08	21.17	1,272.22	3,610.09	448.34
<b>N<sub>1</sub> = 5,</b>	<b>∑ X<sub>1</sub> =</b>	<b>∑ X<sub>2</sub> =</b>			<b>∑ x<sub>1</sub>·x<sub>2</sub> =</b>	<b>∑ x<sub>1</sub><sup>2</sup>=</b>	<b>∑ x<sub>2</sub><sup>2</sup></b>
<b>N<sub>2</sub> = 5</b>	<b>5417.38</b>	<b>4675.28</b>			<b>303605.04</b>	<b>242176.21</b>	<b>398155.85</b>

Correlation between loan loss provision and NPL,

$$(r_{12}) = \frac{\sum x_1 x_2}{\sqrt{\sum x_1^2 \sum x_2^2}}$$

$$= \frac{303605.04}{\sqrt{242176.21 \times 398155.85}} = 0.9777$$

$$r^2 = 0.9559$$

T-value,

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

$$= \frac{0.9777}{\sqrt{1-0.9559}} \times \sqrt{5-2} = 8.07$$

### Appendix IV

#### Calculation of Trend Value of total credit of HBL

The trend line  $Y = a + bX$  ----- (A)

Let's assume that middle year be 3, then  $X = t - 3$

Year	t	Credit (Y)	X= t-3	XY	X <sup>2</sup>
2008/09	1	33503.85	-2	-67007.7	4
2009/10	2	36425.54	-1	-36425.54	1
2010/11	3	40336.92	0	0	0
2011/12	4	44997.01	1	44997.01	1
2012/13	5	47854.74	2	95709.48	4
<b>Total</b>		<b>∑y = 203118.06</b>	<b>∑X = 0</b>	<b>∑xy = 37273.25</b>	<b>∑x<sup>2</sup> = 10</b>

Since,  $\sum X = 0$

The two normal equations obtained from the above equations will be

$$\sum Y = na \quad \text{----- (i)}$$

$$\sum XY = b\sum X^2 \quad \text{----- (ii)}$$

Since, n = number of years under study = 5, the value of 'a' and 'b' can be calculated by solving equation (i) and (ii).

From equation (i)

$$\sum Y = na$$

$$\text{Or, } 203118.06 = 5 \times a$$

$$\text{Or, } a = 40623.61$$

Again, from equation (ii)

$$\sum XY = b\sum X^2$$

$$\text{Or, } 37273.25 = b \times 10$$

$$\text{Or, } b = 3727.33$$

Now, putting the value of 'a' and 'b' in the equation of trend line (A),

$$Y = a + bX$$

$$\text{Or, } Y = 40623.61 + 3727.33X$$

### Calculation of Trend Values

<b>Year</b>	<b>X</b>	<b>Credit</b>	<b>Credit (Y) = 40623.61 + 3727.33X</b>
2008/09	-2	33503.85	$40623.61 + 3727.33 \times (-2) = 33168.95$
2009/10	-1	36425.54	$40623.61 + 3727.33 \times (-1) = 36896.28$
2010/11	0	40336.92	$40623.61 + 3727.33 \times 0 = 40623.61$
2011/12	1	44997.01	$40623.61 + 3727.33 \times 1 = 44350.94$
2012/13	2	47854.74	$40623.61 + 3727.33 \times 2 = 48078.27$
2013/14	3	-	$40623.61 + 3727.33 \times 3 = 51805.60$
2014/15	4	-	$40623.61 + 3727.33 \times 4 = 55532.93$
2015/16	5	-	$40623.61 + 3727.33 \times 5 = 59260.26$
2016/17	6	-	$40623.61 + 3727.33 \times 6 = 62987.59$
2017/18	7	-	$40623.61 + 3727.33 \times 7 = 66259.92$

## Appendix V

### Calculation of Trend Value of total credit of NSBL

The trend line  $Y = a + bX$  ----- (A)

Let's assume that middle year be 3, then  $X = t - 3$

Year	t	Credit (Y)	X= t-3	XY	X <sup>2</sup>
2008/09	1	28417.93	-2	-11021.26	4
2009/10	2	33786.18	-1	-4770.74	1
2010/11	3	40543.79	0	0	0
2011/12	4	50605.54	1	5322.84	1
2012/13	5	56667.38	2	11259.28	4
<b>Total</b>		<b>∑y = 210020.82</b>	<b>∑X = 0</b>	<b>∑xy = 73318.26</b>	<b>∑x<sup>2</sup> = 10</b>

Since,  $\sum X = 0$

The two normal equations obtained from the above equations will be

$$\sum Y = na \quad \text{----- (i)}$$

$$\sum XY = b\sum X^2 \quad \text{----- (ii)}$$

Since, n = number of years under study = 5, the value of 'a' and 'b' can be calculated by solving equation (i) and (ii).

From equation (i)

$$\sum Y = na$$

$$\text{Or, } 210020.82 = 5 \times a$$

$$\text{Or, } a = 42004.16$$

Again, from equation (ii)

$$\sum XY = b\sum X^2$$

$$\text{Or, } 73318.26 = b \times 10$$

$$\text{Or, } b = 7331.83$$

Now, putting the value of 'a' and 'b' in the equation of trend line (A),

$$Y = a + bX$$

$$\text{Or, } Y = 42004.16 + 7331.83X$$

### Calculation of Trend Values

<b>Year</b>	<b>X</b>	<b>Credit</b>	<b>Credit (Y) = 42004.16+7331.83X</b>
2008/09	-2	5510.63	$42004.16+7331.83 \times (-2) = 27340.5$
2009/10	-1	4770.74	$42004.16+7331.83 \times (-1) = 34672.33$
2010/11	0	4689.36	$42004.16+7331.83 \times 0 = 42004.16$
2011/12	1	5322.84	$42004.16+7331.83 \times 1 = 49335.99$
2012/13	2	5629.64	$42004.16+7331.83 \times 2 = 56667.82$
2013/14	3	-	$42004.16+7331.83 \times 3 = 63999.65$
2014/15	4	-	$42004.16+7331.83 \times 4 = 71331.48$
2015/16	5	-	$42004.16+7331.83 \times 5 = 78663.31$
2016/17	6	-	$42004.16+7331.83 \times 6 = 85995.14$
2017/18	7	-	$42004.16+7331.83 \times 7 = 93326.97$