CHAPTER I

INTRODUCTION

1.1 Background of the study

This research study is an attempt to discuss risk management and its importance to the fundamental operation of banks in Nepal & whether the basel II accord and NRB risk management guideline is still applied in the current financial situation, and whether it has helped contribute to the severity of the downturn by creating capital uses at banks in the Nepal and in general proposes to examine different type of risk that Nepal's banks are facing. This research also examines different risk management practices and techniques dealt within banks in Nepal.

Banks are the financial institution that accepts funds in the form of deposits repayable on demand or short notice. Banking as industry is very profitable and renowned business. The complexities aroused due to modernization and urbanization is made easy due to establishment of banks and financial institutions. The bank has simplified the complex transaction like money saving, fund transfer, lending etc. Banks in the economy in mainly to fulfill the need like mobilize savings, capital formation, monetization of the economy, permeation of employment, upliftment of poor, promotion of private investment, rapid economic development, safety of wealth, transfer of money and so on. Accepting deposits and mobilization of deposits is major functions of the bank (Thygerson, 1992).

A simple operational definition of a bank is, A bank is an institution whose current operations consist in receiving deposits andgranting loans from the public(Freixas&Rochet,2008).Banking when properly organized, aids and facilitates growth on trade and considered not as dealers in money but as the leader of development. Bank are not just the storehouse of the country's wealth but are the reservoirs of resources necessary for economic development (Radhaswami and Vasudevan, 1991).

Risk management describes the decisions an organization makes and the action it takes in response to risk that have been identified (Lindauer 2017). Risk management is a comprehensive process adopted by an organization that seeks to minimize the adverse effects it is exposed to due to various factors are economic, political or environmental,

some of them inherent to the business, other unforeseen and unexpected (Mark, Croughy and Galai, 2000).Banks have risks and risk taking is their business. If risk taking is not regulated properly, bank may fail and it would have a disastrous effect on the economy. Therefore monetary authorities across the world regulate functioning of the banks(Mishra 2009).

Credit risk is the risk that a change in the credit quality of counterparty will affect the value of a bank's position. Default, whereby counterparty is unwilling or unable to fulfill its contractual obligations, is the extreme case; however, banks are also exposed to the risk that the counterparty might be downgraded by a rating agency. Credit risk is only an issue when the position is an asset, i.e., when it exhibits a positive replacement value. In that instance, if the counterparty defaults, the bank either loses all of the market value of the position or more commonly, the part of the value that it cannot recover following the credit event (Crouhy, Galai and Mark,2000).

Liquidity risk comprises both funding liquidity risk and trading-related liquidity risk, though these two dimensions of liquidity risk are closely related. Funding liquidity risk relates to a financial institution's ability to raise the necessary cash to roll over its debt, to meet the cash, margin, and collateral requirements of counterparties, and in the case of funds to satisfy capital withdrawals(Crouhy, Galai and Mark, 2000).

The baselaccord comprises a definition of regulatory capital, measures of risk exposure, and rules specifying the level of capital to be maintained in relation to these risks (Hasan, 2002). Although basel I was originally meant for banks in G10 countries. Basel I have been adopted by over 100 countries worldwide and a major milestone in the history of banking industry (King & Sinclair, 2003 &Ghosh, 2004).The framework established a structure that was intended to make regulatory capital more sensitive to differences in risk profiles among banking organizations; take off-balance-sheet exposures explicitly into account in assessing capital adequacy; and lower the disincentives to holding liquid, low risk assets (Jackson, 1999). The basel II is different from the first accord in three respects, firstly, the capital formula is being substantially revised, secondly, guidelines on the supervisory review of bank capital adequacy are being added, thirdly, concept of

market discipline is being introduced through improved disclosure rules (Illing&Paulin, 2005).

Indeed, a study by Tschoegl (2003) indicated that many of the financial crises that emerged in the mid 1990's, including the baringsbank, daiwabank and sumitomocorp failures, were management failures, and were not primarily due to misfortune, errors, complexity or environmental factors. This implies that the majority of risks faced by the banking industry is systematic, and is a result of the structure of trading and of human nature. As such, any attempt at risk management needs to consider this, and ensure that the human factor is actively controlled and managed. However, risk management systems also need to ensure that they take account of the various environmental factors and uncertainties which can affect the human decision making process, and ensure that these are acknowledged and addressed in full.

Banks are established with various objectives. These could either be to influence banks' performance, enhancing profitability or increasing shareholders return, and are often accomplished at the cost of increased risk. Risk-taking is an inherent component of banking and achieving either of these objectives is a reward for successfully managing risk. (Soyemi, Ogunleye and Ashogbon, 2014) observed that the greater the risk, the higher the return, hence, the business must strike a trade-off between the two. In addition, risk management in banking impacts significantly on economic growth of the nation and business development. Inefficient management of risk by banks may not only prevent banks from achieving its objectives but can also lead to bankruptcy. Therefore, banking activities are always involved with various kinds of risk. Risks are considered warranted when they are understandable, measurable, and controllable and within a banks capacity to willingly resist its adverse effect (NRBRMF, 2010). Sound risk management enables bank management to take risks knowingly, reduce risks when appropriate, and prepare for the risk that cannot be predicted (NRBRMF, 2010).

Nepal Rastra Bank (NRB) regulates the national banking system and also functions as the government's central bank. As a regulator, NRB controls foreign exchange; supervises, monitors, and governs operations of banking and non -banking financial institutions; determines interest rates for commercial loans and deposits; and also determines

exchange rates of foreign currencies. As the government's bank, NRB maintains all government income and expenditure accounts, issues Nepali bills and treasury notes, as well as loans to the government and determines monetary policy.

As for history of domestic financial sector development, the Nepalese financial system development has a very recent history, starting just from the early twentieth century. The full period, from initiation to the present, can be broken down into three distinct phases. The shifts in these phases are determined by different milestones: the first milestone is the establishment of the Nepal Rastra Bank, the central bank of nepal, in 1956 - this determines the shift from the first to the second phase; similarly the second milestone is the promulgation of the current NRB Act 2002 - this determines the shift from the second phase to the ongoing third phase. The first phase: This phase corresponds with the initiation of formal domestic banking system in Nepal till the establishment of NRB in 1956. Nepal's formal financial system had a late start and began less than one and a half centuries ago. The establishment of tejarathadda in 1880 can be conceived as the beginning of the process of credit mobilization in Nepal. However, this institution, although formally established, was not allowed to take public deposit and provide credit to public the fund had been provided by the government for credit to their staff and landlords only. Therefore, it was not a bank per se. Even the urban people in need of the financial support had to rely on merchants and landlords because of the limited activities of tejarathadda.

It was only with the establishment of Nepal Bank Limited in 1937 that the financial services were made available to the general public. In this regard, the establishment of NBL was the epoch-making since it signified commencement of formal banking system in Nepal. The second phase: This phase commences with the establishment of NRB in 1956 under the NRB Act 1955, and completes with the promulgation of the current NRB act 2002. With the establishment of NRB in 1956, the process was made easier for establishment of banks and financial institutions in the country. However, this phase can be further subdivided into two sub-periods: The first sub-period or second phase A, was a period of restriction where the Nepalese payment system was characterized as predominantly a cash-economybut, this period took a different turn with the establishment of Nepal Arab Bank Limited as the first joint-venture bank in 1984, under

the government's liberalized policy. The first sub-period saw more directed role of NRB in terms of credit control including directed credit programs and control of different categories of interest rates. In this sub-period, three institutions of diverse nature were established under the full ownership of the Government of Nepal. They were Nepal Industrial Development Corporation in 1959, rastriyabanijya bank and agriculture development bank, Nepal in 1968. The second sub-period or second phase B witnessed greater financial liberalization that practically started from 1984 until the enactment of new NRB Act in 2002. This sub-period corresponds with the overall economic liberalization policy of GON after the nation underwent sustained balance of payment crisis in the early 1980s.

This later sub- period saw major shifts in the policy measures such as: from a controlled to a deregulated framework of interest rate; from direct to indirect methods of monetary control, emphasizing open market operations as the main policy tool; and permitting market-determined exchange rate of the Nepalese currency against convertible currencies and full convertibility of the Nepalese currency in the current account. During this sub-period, Nepal Indosuez Bank later named as Nepal Investment Bank and Nepal Grindlays Bank now Standard Chartered Bank Nepal were established in 1986 and 1987 respectively as the second and third joint-venture banks.

However, no fully owned domestic-funded banks were established during this period. The entry of other development banks, finance companies, micro-credit development banks, savings and credit cooperatives and non-government organizations for limited banking transactions started after 1992 under three major acts namely Finance Company Act 1985, Company Act 1964 and Development Bank Act 1996. The third phase: the current NRB Act of 2002 marks the initiation of the currently undergoing third phase. This act replaced the NRB Act 1955 and allowed NRB to be more autonomous in exercising decisions relating to formulation of monetary and foreign exchange policy as well as monitoring and regulating banks and financial institutions across the nation.

However, it was felt that the existing situation of multiple numbers of acts under banking and financial institution sector made the process of regulation and monitoring system very cumbersome. As a result and as a process of financial sector reform program, all

those diversified acts were grouped together under the Bank and Financial Institution Act, 2006. This Act, also known as Umbrella Act, categorized all the banks and financial institutions under four heads on the basis responsibility differences: group A as commercial bank; group B as development bank; group C as finance company; and group D as micro-credit development banks. The other two forms of institutions, namely saving and credit cooperatives and non-government organizations, both allowed by NRB for limited banking transactions, are however not put in any of those groups and are being operated under specific directives and rules (Bhattarai, 2005).

The banking sector in Nepal first started with the establishment of Nepal Bank Limited as a first commercial bank in 1937. This was a joint-venture between the government sector with 51 percent share and the private sector with 49 percent share. The establishment of Nepal Rastra Bank as a central bank of Nepal in 1956 gave new momentum to development and growth of the Nepalese financial system (Gajurel&Pradhan, 2012). Within a decade, the number of major banking institution were established in the public sector such as Agriculture Development Bank, Nepal Industrial Development Corporation, Employees Provident Fund Corporation, RastriyaBanijya Bank, Credit Guarantee Corporation, Nepal Insurance Corporation, and Securities Marketing Centre (Acharya, 2003). The expansion of the sector enabled the start of major financial activities in the country such as issuance of shares, provident fund, insurance etc.

For current status, presently, as of March 1, 2019, the number of banks and financial institutions licensed by NRB are 25 commercial banks under Group A; 33 development banks under Group B; 15 finance companies under Group C; and 47 micro-credit development banks under Group D. Similarly, there are 16 savings and credit co-operatives and 45 non-government organizations, both being allowed by NRB for undertaking limited banking transactions.

Banks mobilize the small savings of the people and make them available for productive purposes. Banks promote the habit of savings among the people thereby offering attractive rates of interests on their deposits. Banks provide safety and security to the surplus money of the depositors and as well provide convenient and economical methods of payment. Banks provide convenient means of transfer of fund from one place to

another. Banks helps in the movement of capital from regions where it is less useful to regions where it can be more useful. Banks advances exposure in trade and commerce, industry and agriculture by knowing their financial requirements and prospects. Bank acts as an intermediary between the depositors and the investors. Bank also acts as mediator between exporter and importer who does foreign trades.

Banks are always faced with different types of risks that may have a potentially negative effect on their business. Risk-taking is an inherent element of banking and, indeed, profits are in part the reward for successful risk taking in business. On the other hand, excessive and poorly managed risk can lead to losses and thus endanger the safety of a bank's depositors. Risks are considered warranted when they are understandable, measurable, controllable and within a bank's capacity to readily withstand adverse results. Sound risk management systems enable managers of banks to take risks knowingly, reduce risks where appropriate and strive to prepare for a future, which by its nature cannot be predicted.

Nepal Rastra Bank laid significant emphasis on the adequacy of a bank's management of risk. NRB puts forward this document for the purpose of providing guidelines to all commercial banks on risk management systems that are expected to be in place. This document sets out minimum standards that shall be expected of a risk management framework. Overall risk management is of utmost importance to banks, and as such, policies and procedures should be endorsed and strictly enforced by the senior management and the board of the bank.

To help the banks to recognize the different kinds of risks and to take adequate steps to overcome the under capitalization of banks assets and lessen the credit and operational risks faced by banks. In 1988, banks of international settlement set up basel committee on banking supervision, which issue guidelines for updating risk management in banks. These guidelines brought about standardization and made universal among the global banking committee for risk management and seek to protect the interest of the depositors and shareholders of the bank. As per the guidelines issued, capital adequacy was considered panacea for risk management and all banks were advised to have capital adequacy ratio at 8% or more. CAR is the ratio of capital to risk weighted assets and it

provides cushion to the depositors in case of bankruptcy. In January 1999, the baselcommittee proposed a new capital accord, known as basel II. A sound framework for measuring and quantifying the risk associated with banking operations put by it. The emphasis of new baselaccord is on flexibility, efficient operations and higher revenues for banks with full acknowledgement of risks. The new accord makes clear distinction between the credit risk, market risk and operational risk stipulating assessment of risk weightage covering all the three types of risks separately. It also provides a range of options to the banks, for determining the capital requirements for credit risk, market risk and operational risk. Banks are required to select approaches that are most appropriate for their operations and financial markets. (Basel Committee on Banking Supervision, 2005) In 2010, NRB issued the first draft guidelines on basel II implementations in which an initial target date forbasel II compliance was set for 2010 for all commercial banks, excluding local area banks and regional rural banks.

The sound practices set out by the basel committee to specifically address the following areas, establishing an appropriate risk environment, operating under a sound banking process, maintaining an appropriate administration, measurement and monitoring process, ensuring adequate controls over risk.

To conclude, the banking industry is characterized with intense competition and rapid changes in the customer's expectation. In all banking industries there are key fundamental economic structure and the technique characters which lead to competitive force. The ultimate objective of this research study is study the risks management practices implemented by commercial banks in Nepal create sustained competitive advantage. The present study utilized the quantitative study design among the Nepalese commercial bank risk position. The risk faced by the bank is not similar for all the banks it will differ and hence each bank follows its own risk management model. Modern risk management methods have further margins to develop and should be seen as complements to and not substitutes for good judgment, experience and technical knowledge. Advanced systems in computers will never replace the earning of physical appearance of loan officer or risk manager.

1.2Statement of the problem

Nepalese commercial banks have faced difficulties over the past years mostly due to relaxed credit standard, liquidity standard and poor portfolio risk management. There are policies put in placements to improve bank performance as well as measures to minimize the negative effect of lending. In order to meet the increased capital requirement set by the central bank of Nepal, there is a tendency among commercial banks to go into mergers which may gradually minimize the level of competition amongst banks. It is envisioned to result in the avoidance of inappropriate credit approval and liquidity maintenance pressure processes blamed to be due to competition among banks.

This study has aimed to find out the following questions:

1. What is the position of credit risk of NIBL and NABIL bank?

2. What is the position of liquidity risk of NIBL and NABIL bank?

1.3Objective of the study

The main objective of the study is to identify the risk management practice in Nepalese commercial bank. The specific objectives of the present study are;

1. To examine and compare the credit risk position in NIBL and NABIL bank.

2. To examine and compare the of liquidity risk position in NIBL and NABIL bank.

1.4Significance of the study

The degree of possible risk in the banking sector is of major concern to the various stakeholders including the top management who operates the banking activities, depositors whose funds are being used and regulatory bodies who are responsible for the protection of banking system. The commercial banks operating in Nepal have faced difficulties over the past years for multiple reasons. The major reasons identified were relaxed credit standards and poor portfolio risk management. In a country where the financial sector is dominated by the commercial banks, any failure in the sector has an immense implication on the economic growth of the country. This is due to the fact that any bankruptcy that could happen in the sector has a contagious effect that can lead to bank runs, crisis and bring overall financial crisis and economic tribulations.

Risk arises due to uncertainties, which in turn arise due to changes taking place in prevailing economic, social and political environment and lack of non-availability of information concerning such changes. Risk is an exposure to a transaction with loss, which occurs with some probability and which can be expected, measured and minimized. In financial institutions risk result from variations and fluctuations in assets or liability or both in incomes from assets or payments on liabilities or in outflows and inflows of cash. Though the performance of the industry has increased, but this has brought in severe competition and several types of risk. Risk is the concept which cannot be eliminated completely from the banking business. The present study is conducted to measure the credit risk and liquidity risk in Nepal Investment Bank Limited (NIBL) and NABIL Bank.

1.5 Organization of chapters

The study is organized into the following five chapters. Chapter 1 is the introductory part of the study. This chapter describes the general background of the study, focus of the study, statement of the problem, objectives of the study, rationale of the study and limitations of the study. Chapter 2 is review of literature, the theoretical framework of risk management and bank performance are first presented followed by the review of the various empirical studies and researches in Nepal or other countries. The succeeding section of this chapter then presents the theoretical literature pertinent to the research to better understand the factors that may influence bank's financial performance. Chapter 3 isResearch Methodology which discusses the models and methods used to ascertain the relationship between bank management and the accounting performance of commercial banks of Nepal. Chapter 4 is Data Presentation and Analysis contains the concept of credit and credit risk, objectives of credit risk management, risk identification, risk measurement, tools of credit risk management, and Basel committee's principles of credit risk management, measuring the magnitude of credit risk in Banks and measuring the magnitude of credit risk in bank.This chapter contains an overview of liquidity and liquidity risk of banks, measuring and managing liquidity risk, Basel committee's principles of liquidity risk management, measuring the magnitude of liquidity risk of banks. This chapter covers comparative study of risk management in NIBL and NABIL

Bank. This chapter presents the empirical findings of the study. The chapter starts with a short introduction, followed by the data and data description are also presented and discussed. The chapter ends with the descriptive statistics of the various variables included in the study. The stationary tests results and then the discussion of the pooled regression analysis and ends with results of the panel data analysis. Chapter 5 issummary, conclusion & recommendations contains major findings of the study, conclusions and suggestions. It starts with a summary of the findings and then provides recommendations as well as areas of further research at the end of the chapter.

CHAPTER II

REVIEW OF LITERATURE

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

2.1Related theories

In one of the publications Price Waterhouse Cooper has interpreted the word risk in two distinct senses viz., risk as hazard and risk as opportunity. The Theories reviewed in this study are over view of credit and liquidity risk of banks according to Basel II Approach and NRB risk management Guidelines.

2.1.1 An overviewofcreditandcreditriskofbanks

Financial institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers and counterparties, poor portfolio risk management, or a lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counterparties. This experience is common in both G-10 and nonG10 countries. Credit risk is one of the great concerns to bank authorities and banking regulators because credit risk can easily and most likely prompts bank failure. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization. Hence in this chapter it is proposed to study in brief credit risk management, instruments and tools of credit risk management, Basel committee's principles,NRB principles measure the magnitude of credit risk in NIBL and NABIL banks.

The aspects covered in this chapter are concept of credit and credit risk, objectives of credit risk management, risk identification,risk measurement, tools of credit risk management, the Basel committee's principles of credit risk management, measuring the magnitude of credit risk in banks.

2.1.1.1 Concept ofcredit andcreditrisk

The word credit is derived from the Latin word credere, meaning trust. When the seller transfer's his wealth to a buyer who has agreed to pay later, there is a clear implication of trust that the payment will be made at the agreed date. The credit period and the amount of credit depend upon the degree of trust. Credit bears a cost, the cost of the seller having to borrow until the customers payment arrives. Ideally, that cost is the price but, as most customers pay later than agreed, the extra unplanned cost erodes the planned net profit. Credit creation involves huge risks to both the lender and the borrower.

According to Basel Committee on Banking Supervision, credit risk is most simply defined as, the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. Credit risk can greatly jeopardize the smooth functioning of a bank's business. On the other hand, a bank with high credit risk has high bankruptcy risk that puts the depositors in jeopardy. The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. In the global scenario, the increased credit risk arises due to two reasons. First, banks have been forced to lend to riskier clients because well-rated corporates have moved away from banks as they have access to low cost funds through disintermediation. The other reason is the lurking fear of global recession. Recession in the economy could lead to low industrial output which may lead to defaults by the industry under recession culminating into credit risk.

2.1.1.2 Objectives of credit risk management

The credit risk management has different objectives at two levels namely transaction level and portfolio level. At transaction level, the objectives of credit risk management are, setting an appropriate credit risk environment, framing a sound credit approval process, maintaining an appropriate credit administration, measurement and monitoring process, employing sophisticated tools or techniques to enable continuous risk evaluation on a scientific basis, ensuring adequate pricing formula to optimize risk return relationship.At portfolio level the objectives of credit risk management are development and monitoring of methodologies and norms to evaluate and mitigate risks arising from concentrating by industry, group and product etc. ensuring adherence to regulatory

guidelines, driving asset growth strategy, the transaction level pursues value creation and the portfolio level pursues value preservation.

The credit risk management in a bank receives the top management's attention and the process encompassesmeasurement of risk through credit rating or scoring, quantifying the risk through estimating expected loan losses and unexpected loan losses, risk pricing on a scientific basis, controlling the risk through effective loan review mechanism and portfolio management.

The credit risk management process is articulated in the bank's loan policy, duly approved by the board. Each bank constitutes a high level credit policy committee, also called credit risk management committee to deal with issues relating to credit policy and procedures. The committee is headed by the chairman and comprise of heads credit department, treasury, credit risk management department (CRMD) and the chief economist.

2.1.1.3Risk identification

Credit risk arises from potential changes in the credit quality of a borrower. Credit risk may be classified into transaction level risk and portfolio risk. Transaction level risks have two components viz., Default risk, and Credit spread risk.

Default risk is driven by the potential failure of a borrower to make promised payments, either partly or wholly. In the event of default, a fraction of the obligations will normally be paid. This is known as the recovery rate. Credit Spread Riskor Downgrade Risk whena borrower does not default, there is still risk due to worsening in credit quality. This result in the possible widening of the credit- spread. This is known as credit spread risk. Credit spread risk may arise from a rating change i.e., an upgrade or a downgrade. Default risk and downgrade risk are transaction level risks.

Risks associated with credit portfolio as a whole is termed as portfolio risk. Portfolio risk has two components viz, Systematic or Intrinsic Risk, Concentration Risk.Systematic or Intrinsic Risk is portfolio risk can be reduced due to diversification. If a portfolio is fully diversified, i.e. diversified across geographies, industries, borrowers, markets, etc. equitably, and then the portfolio risk is reduced to a minimum level. This minimum level

corresponds to the risks in the economy in which it is operating. This is systematic or intrinsic risk. A portfolio is open to the systematic risk i.e., the risks associated with the economy. If economy as a whole does not perform well, the portfolio performance will be affected. Concentration Risk when the portfolio is not diversified that is to say that it has higher weight in respect of a borrower or geography or industry etc., the portfolio is termed as concentration risk.

A variant of credit risk is counterparty risk. The counterparty risk arises from non-performance of the trading partners. The non-performance may arise from counterparty's refusal / inability to perform. The counterparty risk is generally viewed as a transient financial risk associated with trading rather than standard credit risk. 'Country Risk' is also another type of credit risk where non-performance by a borrower or counterparty arises because of restrictions imposed by a sovereign. The restrictions may be in the nature of a sanction or may arise due to economic conditions.

2.1.1.4 Credit risk measurement

Measurement of credit risk consists of measurement of risk through credit rating/scoring and quantifying the risk through estimating expected loan losses i.e. the amount of loan losses that bank would experience over a chosen time horizon through tracking portfolio behavior over 5 or more years and unexpected loan losses i.e. the amount by which actual losses exceed the expected lossthrough standard deviation of losses or the difference between expected loan losses and some selected target credit loss quintile.

Credit Rating of an account is done with primary objective to determine whether the account, after the expiry of a given period, would remain a performing asset. In other words, credit rating exercise seeks to predict whether the borrower would have the capability to honor its financial commitment in future to the rest of the world.

In order to manage the credit portfolio the bank must have in place credit rating model or models for different categories of loans and advances and develop and maintain necessary data on defaults of borrowers rating category wise i.e. Rating Migration.

A credit rating model essentially differentiates borrowers based on degree of stability in terms of top line e.g., sales, bottom-line net profit revenue generation. This is because

where uncertainty in revenue generation in a business is more, chances of failing in keeping financial commitments to the rest of the world is also more. Where revenue generation is stable over a given period, uncertainty or risk associated is zero. For example, cash generation from an investment in govt. Securities is absolutely stable and hence risk associated with such investment is also non-existent. This would also mean that an A rated borrower would have more stable revenue generation than that of a B rated borrower and an A++ rated borrower's revenue generation would be more stable than that of A rated. There is several rating models with various levels of complexities and require data that could be fairly extensive and cover few years. Some of the risk rating methodologies used are as below:

Altman's Z score model: Altman's Z score model involves forecasting the probability of a company entering bankruptcy. It separates defaulting borrower from non-defaulting borrower on the basis of certain financial ratios, which is converted into simple index.

Credit Metrics:Credit Metrics developed by J.P.Morgan, focus on estimating the volatility of asset value caused by the variation in the quality of assets. The model tracks rating migration which is the probability that borrower migrates from one risk rating to another risk rating.

Credit Risk+:Credit Risk + was developed by Credit Suisse First Boston (CSFB). Credit Risk+, is a statistical method based on the insurance industry for measuring credit risk. It is based on actuarial rates and unexpected losses from defaults.

KMV Model:KMV, through its EDF methodology derives the actual probability of default for each obligor based on functions of capital structure, the volatility of asset returns and current asset value.

Mckinsey's credit portfolio: Mckinsey's credit portfolio view is a multi-factor model which is used to stimulate the distribution of default probabilities, as well as migration probabilities conditioned on the value of macro-economic factors like the unemployment rate, GDP growth, forex rates, etc.

Rating migration is change in the rating of a borrower over a period of time when rated on the same standard or model. As in case of rating of borrower, rating migration of a

single account also does not convey much. It becomes useful when migration of a large number of accounts of similar rating is observed. If, there are 100 'A' rated borrowers as on 31st March, 2017. When these accounts are rated again as on 31st March 2018, i.e. after one year, typically there may be new ratings found.

2.1.1.5 Tools ofcreditriskmanagement

A. Credit riskpolicies and guidelinesat transaction level. Credit risk taking policy and guidelines at transaction level should be clearly articulated in the bank's loan policy document approved by the board. Standards and guidelines should be outlined for, delegation of powers, credit appraisals, rating standards and benchmarks derived from the risk rating system, pricing strategy.

Each Bank should have a carefully formulated scheme of delegation of powers. The banks should also evolve multi-tier credit approving system where the loan proposals are approved by an approval grid or a committee. The grid or committee, comprising at least 3 or 4 officers, may approve the credit facilities above a specified limit and invariably one officer should represent the CRMD, who has no volume and profit targets. The spirit of the credit approving system may be that no credit proposals should be approved or recommended to higher authorities, if majority members of the approval grid or committee do not agree on the creditworthiness of the borrower. In case of disagreement the specific views of the dissenting member/s should be recorded.

Credit appraisal guidelines include borrower standards, procedures for analyzing credit requirements and risk factors, policies on standards for presentation of credit proposals, financial covenants, rating standards and benchmarks etc. This brings uniformity of approach in credit risk taking activity across the organization. Credit appraisal guidelines may include risk monitoring and evaluation of assets at transaction level, pricing of loans, regulatory/legal compliance, etc.

Prudential limits serve the purpose of limiting credit risk. There are several aspects for which prudential limits may be specified. They may include prudential limits for financial and profitability ratios such as current ratio, debt equity and return on capital or return on assets etc., and debt service coverage ratio etc.,prudential limits for credit exposure,prudential limits for asset concentration, prudential limits for large exposures,

prudential limit for maturity profile of the loan book. Prudential limits may have flexibility for deviations. The conditions subject to which deviations are permitted and the authority thereof should also be clearly spelt out in the loan policy.

The credit risk assessment exercise should be repeated bi-annually or even at shorter intervals for low quality customers and should be delinked invariably from the regular renewal exercise. The updating of the credit rating should be undertaken normally at quarterly intervals or at least at half-yearly intervals, in order to gauge the asset quality at periodic intervals. Rating changes have implication at portfolio level. Variations in the ratings of borrowers over time indicate changes in credit quality and expected loan losses from the credit portfolio. Thus, if the rating system is to be meaningful, the credit quality reports should signal changes in expected loan losses. The banks should undertake comprehensive study on migration upward-lower to higher and downward-higher to lower of borrowers in the ratings to add accuracy in expected loan loss calculations. The pricing strategy for credit products should more towards risk based pricing to generate adequate risk adjusted returns on capital. The credit spread should have a bearing on expected loss rates and charges on capital.

Risk-return pricing is a fundamental tenet of risk management. In a risk-return setting, borrowers with weak financial position are high credit risk stake and should be priced high. Pricing of credit risk should have a bearing on the probability of default. Since probability of default is linked to risk rating, pricing of loans normally should be linked to rating. However, value of collateral, value of accounts, future business potential, portfolio/industry exposure and strategic reasons may also play important role in pricing.

There is, however, a need for comparing the prices quoted by competitors for borrowers perched on the same rating/quality. Thus, any attempt at price-cutting for market share would result in wrong pricing of risk.

In credit control and monitoring at portfolio level credit control and monitoring at portfolio level deals with the risk of a given portfolio, expected losses, requirement of risk capital, impact of changing the portfolio mix on risk, expected losses and capital. It also deals with the marginal and absolute risk contribution of a new position and

diversification benefits that come out of changing the mix. It also analyses factors that affect the portfolio's risk profile.

Identification of portfolio credit weakness in advance-through credit quality migrations move from measuring obligor specific risk associated with individual credit exposures to measuring concentration effects on the portfolio as a whole, evaluate exposure distribution over rating categories and stipulate quantitative ceilings on aggregate exposure in specified rating categories evaluate rating wise distribution in various industries and set corresponding exposure limits to contain concentration risk move towards credit portfolio value at risk models.

The existing framework of tracking the non-performing loans around the balance sheet data does not signal the quality of the entire loan book. A system for identification of credit weaknesses well in advance could be realized by tracking the migration upward or downward of borrowers from one rating scale to another. This process would be meaningful only if the borrower wise ratings are updated at quarterly/half-yearly intervals. Data on movements within grading categories provide a useful insight into the nature and composition of portfolio.

Some measures to maintain the portfolio quality are quantitative ceiling on aggregate exposure in specified rating categories. Evaluation of rating wise distribution of borrowers in various industries, business segments, etc. Industries wise and sector wise monitoring of exposure of risk performance. Where portfolio exposure to a single industry is badly performing, the banks may increase the quality standards for that specific industry. Targets for probable defaults and provisioning requirements as a prudent planning exercise. For any deviation/s from the expected parameters, an exercise for restructuring of the portfolio should immediately be undertaken and if necessary, the entry-level criteria could be enhanced to insulate the portfolio from further deterioration. Introduce discriminatory time schedules for review of borrowers.

The credit risk of a bank's portfolio depends on both external and internal factors. The external factor are the state of the economy, wide swings in commodity/equity prices, foreign exchange rates and interest rates, trade restrictions, economic sanctions, Government policies etc. The internal factors are deficiencies in loan

policies/administration, absence of prudential credit concentration limit, inadequately defined lending limits, deficiencies in appraisal of borrowers financial position, excessive dependence on collaterals inadequate risk pricing, absence of loan review mechanism and post sanction surveillance, etc. Portfolio performance may be analyzed to identify the causes and necessary remedial action.

Controlling credit risk though loan review mechanism (LRM):LRM is an effective tool for constantly evaluating the quality of loan book and to bring about qualitative improvements in credit administration. Loan Review Mechanism is used for large value accounts with responsibilities assigned in various areas such as, evaluating effectiveness of loan administration, maintaining the integrity of credit grading process, assessing portfolio quality, etc.

2.1.1.6 The Basel committee and NRB risk management guideline's principles of credit risk management

Principle 1: The board of directors should have responsibility for approving and periodically at least annually internal risk rating system reviewing the credit risk strategy and significant credit risk policies of the bank. The strategy should reflect the bank's tolerance for risk and the level of profitability the bank expects to achieve for incurring various credit risks.

Principle 2: Senior management should have the responsibility for implementing the credit risk strategy approved by the board of directors and for developing policies and procedures for identifying, measuring, monitoring and controlling credit risk. Such policies and procedures should address credit risk in all of the bank's activities and at both the individual credit and portfolio levels.

Principle 3: Banks should identify and manage credit risk inherent in all products and activities. Bank should ensure that the risks of products and activities new to them are subject to adequate risk management procedures and controls before being introduced or undertaken, and approved in advance by the board of directors or its appropriate committee.

Principle 4: Banks must operate within sound, well-defined credit-granting criteria. These criteria should include a clear indication of the bank's target market and a thorough understanding of the borrower or counterparty, as well as the purpose and structure of the credit, and its source of repayment.

Principle 5: Banks should establish overall credit limits at the level of individual borrowers and counter parties, and groups of connected counterparties that aggregate in a comparable and meaningful manner different types of exposures, both in the banking and trading book and on-and off-balance sheet.

Principle 6: Banks should have a clearly established process in place for approving new credits as well as the amendment, renewal and re-financing of existing credits.

Principle 7: All extensions of credit must be made on an arm's length basis. In particular, credits to related companies and individuals must be authorized on an exception basis, monitored with particular care and other appropriate steps taken to control or mitigate the risks of non-arm's length lending.

Principle 8: Banks should have in place a system for the ongoing administration of their various credit risk-bearing portfolios.

Principle 9: Banks must have in place a system for monitoring the condition of individual credits, including determining the adequacy of provisions and reserves.

Principle 10: Banks are encouraged to develop and utilize and in managing credit risk. The rating system should be consistent with the nature, size and complexity of a bank's activities.

Principle 11: Banks must have information systems and analytical techniques that enable management to measure the credit risk inherent in all on-and off-balance sheet activities. The management information system should provide adequate information on the composition of the credit portfolio, including identification of any concentrations of risk.

Principle 12: Banks must have in place a system for monitoring the overall composition and quality of the credit portfolio.

Principle 13: Banks should take into consideration potential future changes in economic conditions when assessing individual credits and their credit portfolios, and should assess their credit risk exposures under stressful conditions.

Principle 14: Banks must establish a system of independent, ongoing assessment of the bank's credit risk management processes and the results of such reviews should be communicated directly to the board of directors and senior management.

Principle 15: Banks must ensure that the credit-granting function is being properly managed and that credit exposures are within levels consistent with prudential standards and internal limits. Banks should establish and enforce internal controls and other practices to ensure that exceptions to policies, procedures and limits are reported in a timely manner to the appropriate level of management for action.

Principle 16: Banks must have a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations.

Principle 17: Supervisors should require that banks have an effective system in place to identify measure, monitor and control credit risk as part of an overall approach to risk management. Supervisors should conduct an independent evaluation of a bank's strategies, policies, procedures and practices related to the granting of credit and the ongoing management of the portfolio. Supervisors should consider setting prudential limits to restrict bank exposures to single borrowers or groups of connected counterparties.

The following are the sound practices set out by the Basel committee to specifically address the areas of establishing an appropriate credit risk environment;operating under a sound credit granting process; maintaining an appropriate credit administration, measurement and monitoring process; and ensuring adequate controls over credit risk.

Although specific credit risk management practices may differ among banks depending upon the nature and complexity of their credit activities, a comprehensive credit risk management program should address these four areas. These practices should also be applied in conjunction with sound practices related to the assessment of asset quality, the adequacy of provisions and reserves and the disclosure of credit risk.

2.1.1.7 Measurement the magnitude of credit risk in banks

The following ratios are used to analyze the credit risk in Bank:

1. Ratio of non- performing assets (NPA) to total loans (TL)

2. Ratio of risk adjusted margin (RAM)

3. Ratio of total loan loss provision (LLP) to total loans (TL)

4. Ratio of total loans (TL) to total assets (TA)

5. Ratio of total loans (TL) to total deposits (TD)

6. Ratio of total equity (TE) to total assets (TA)

7. Ratio of total loans (TL) to total equity (TE)

8. Ratio of total assets (TA) to fross domestic product (GDP)

9. Ratio of provisions for loan loss (PFLL) to non-performing assets (NPA)

10. Ratio of non-performing assets (NPA) to NPA and total equity (NPA + TE)

Traditionally, credit risk management was the primary challenge for banks. With progressive deregulation, market risk arising from adverse changes in market variables, such as interest rate, foreign exchange rate, equity price and commodity price has become relatively more important. Even a small change in market variables causes substantial changes in income and economic value of banks. Market risk takes the form of liquidity risk, interest rate risk, foreign exchange rate risk, commodity price risk and equity price risk.

2.1.2 An overview of liquidity and liquidity risk of banks:

Liquidity is a bank's ability to generate cash quickly and at a reasonable cost. Bank needs liquidity to meet its routine expenses, such as interest payments and overhead costs. More importantly, as financial intermediaries, they need liquidity to meet unexpected liquidity shocks, such as large deposit withdrawals or heavy loan demand. The most extreme consequence of a liquidity shock is a bank run. If all depositors attempt to withdraw their money at once, almost any bank will be unable to cover their claims and will fail-even though it might otherwise be in sound financial condition. However, individual

institutions are rarely allowed to fail, because of the safety net existing in most countries in the form of deposit insurance, the central bank's role as lender of last resort, and stringent capital requirements. However, if a bank does not plan carefully, it may be forced to turn to high-cost sources of funding to cover liquidity shocks thus cutting into profitability, and ultimately, into its very existence.

Hence in this Chapter it is proposed to study an overview picture of liquidity risk management in commercial banks, Basel committee's principles, measure the magnitude of liquidity risk in NIBL and NABIL banks and finally the hypothesis is tested to analyze the relationship between CAR as per Basel I and Basel II norms with liquidity risk ratios using regression model. The aspects covered in this chapter are an overview of liquidity and liquidity risk of banks, measuring and managing liquidity risk, the basel committee's principles of liquidity risk management, measuring the magnitude of liquidity risk in banks.

2.1.2.1 Liquidity risk

Liquidity risk arises when the bank may not be able to fund increases in assets or meet liability obligations as they fall due without incurring unacceptable losses. The problem may lie in the bank's inability to liquidate assets or obtain funding to meet its obligations. The problem could also arise due to uncontrollable factors such as market disruption or liquidity squeeze. Liquidity problems can have an adverse impact on the bank's earnings and capital, and in extreme circumstances, may even lead to the collapse of thebank itself, through the bank may otherwise be solvent. Liquidity problems can also affect the proper functioning of payment systems and other financial markets.

Recent trends in the liability profiles of banks pose further challenges to the industry and bring in liquidity risk to the banks. This is basically due to reasons of increasing proportion in bank liabilities of wholesale and capital market funding, which are more sensitive to credit and market risks; increase in off-balance sheet activities such as derivatives and securitization that have compounded the challenge of cash flow management; and speed with which funds can be transmitted and withdrawn, thanks to advanced technology and systems.

Symptoms ofpotential liquidity problems areinternal and market indicators could be useful to assess whether a potential liquidity problem is developing.

Internal indicators areAsset quality is deteriorating as evident by growing proportion of impaired assets, excessive concentrations on certain assets and funding sources, declining spreads, interest margins and earnings,increasing cost of borrowings, rapid asset growth funded by volatile liabilities.Market indicators arecredit rating downgrades, gradual but persistent fall in the share prices of the bank, widened spread on the bank's senior and subordinated debt, reduction in available credit lines from correspondent banks, increasing trend of deposit withdrawals.

Liquidity exposure can stem from both internally institution specific and externally generated factors. External liquidity risks can be geographic, systemic or instrument specific. Internal liquidity risk relates largely to perceptions of an institution in its various markets: local, regional, national or international. Other categories of liquidity risk are, Funding risk: Need to replace net outflows due to unanticipated withdrawal/non-renewal of deposits wholesale and retail.Time risk isneed to compensate for non-receipt of expected inflows of funds.Call risk is crystallization of contingent liabilities are inability to undertake profitable business opportunities when desirable.

2.1.2.2 Measuring and managing liquidity

Measuring and managing liquidity are among the most vital activities of commercial banks. Liquidity management can reduce the probability of an irreversible adverse situation developing. When crises develops, because of a problem elsewhere at a bank, such as a severe deterioration in asset quality or the uncovering of fraud, or where a crisis reflects a generalized loss of confidence in financial institutions, the time available to a bank to address the problem will be determined by its liquidity. Indeed, the importance of liquidity transcends the individual institution, since a liquidity shortfall at a single institution can have system-wide repercussions. For this reason, the analysis of liquidity requires bank managements to measure not only the liquidity positions of banks on an ongoing basis but also to examine how funding requirements are likely to evolve under crisis scenarios.

In particular, good management information systems, central liquidity control analysis of net funding requirements under alternative scenarios, diversification of funding sources, and contingency crucial elements of strong liquidity management at a bank of any size or scope of operations. Following steps are necessary for managing liquidity risk in banks.

Developing a structure for managing liquidity risk: Sound liquidity risk management involves setting a strategy for the bank ensuring effective board and senior management oversight as well as operating under a sound process for measuring, monitoring and controlling liquidity risk. Virtually every financial transactions or commitment has implications for a bank's liquidity. Moreover, the transformation of illiquid into more liquid ones is a key activity of banks. Thus, a bank's liquidity policies and liquidity management approach should form the key elements of a bank's general business strategy.

Understanding the context of liquidity management involves examining a bank's managerial approach to funding and liquidity operations and its liquidity planning under alternative scenarios as liquidity strategy should set out the general approach the bank will have to liquidity including various quantitative and qualitative targets, strategy should also address the bank's goal of protecting financial strategy and the ability to withstand stressful events in the market place, liquidity should enunciate specific policies on particular aspects of liquidity management like composition of assets and liabilities maintain cumulative gaps over certain period and approach to managing liquidity in different currencies and from one country to another, strategy of managing liquidity risk should be communicated throughout the organization. All business units within the bank that conduct activities having an impact on liquidity should be fully aware of the liquidity strategy and operate under the approved policies and procedures. The Board should monitor the performance and liquidity risk profile of the bank and periodically review information that is timely and sufficiently detailed to allow them to understand and asses the liquidity risk facing the bank's key portfolios and the bank as a whole.

Setting tolerance level and limit for liquidity risk: Bank's management should set limits to ensure liquidity and these limits should be reviewed by supervisors. Alternatively supervisors may set the limits. Limits could be set on the cumulative cash flow

mismatches i.e. the cumulative net funding requirement as a percentage of total liabilities over particular periods-next day, next week, next fortnight, next month, and next year. These mismatches should be calculated by taking a conservative view of marketability of liquid assets, with a discount to cover price volatility and any drop in price in the event of a forced sale, and should include likely outflows as a result of draw-down of commitments, etc., liquid assets as a percentage of short-term liabilities. The assets included in this category should be those which are highly liquid, i.e. only those which are judged to be having a ready market even in periods of stress. Also limit on loan to deposit ratio.Also limit on loan to capital ratio. A general limit on the relationship between anticipated funding needs and available sources for meeting those needs. Primary sources for meeting funding needs should be quantified. Flexible limits on the percentage reliance on a particular liability category. E.g. certificates of deposits should not account for more than certain per cent of total liabilities.Set limits on the dependence on individual customers or market segments for funds in liquidity position calculations. Flexible limits on the minimum/maximum average maturity of different categories of liabilities. Minimum liquidity provision to be maintained to sustain operations.

Measuring and managing funding requirement can be done through two approaches i.e. stock approach, flow approach.

Stock approach is based on the level of assets and liabilities as well as off balance sheet exposures on a particular date. The following ratios are calculated to assess the liquidity position of a bank.

Ratio of core deposit to total assets: More the ratio better it is because core deposits are treated to be the stable source of liquidity. Core deposit will constitute deposits from the public in the normal course of business.

Net loans to totals deposits ratio: It reflects the ratio of loans to public deposits or core deposits. Total loans in this ratio represent net advances after deduction of provision for loan losses and interest suspense account. Loan is treated to be less liquid asset and therefore lower the ratio better it is.

Ratio of time deposit to total deposits: Time deposits provide stable level of liquidity and negligible volatility. Therefore, higher the ratio better it is.

Ratio of volatile liabilities to total assets: Volatile liabilities like market borrowings are to be assessed and compared with the total assets. Higher portion of volatile assets will paused higher problems of liquidity. Therefore, lower the ratio better it is.

Ratio of short-term liabilities to liquid assets: Short-term liabilities are required to be redeemed at the earliest. Therefore, they will require ready liquid assets to meet the liability. It is expected to be lower in the interest of liquidity.

Ratio of liquid assets to total assets: Higher level of liquid assets in total assets will ensure better liquidity. Therefore, higher the ratio better it is. Liquid assets may include bank balances, money at call and short notice, interbank placements due within one month, securities held for trading and available for sale having ready market.

Ratio of short-term liabilities to total assets: Short-term liabilities may include balances in current account, volatile portion of savings accounts leaving behind core portion of saving which is constantly maintained. Maturing deposits within a short period of one month. A lower ratio is desirable.

Ratio of prime asset to total asset: Prime assets may include cash balances with the bank and balances with banks including central bank which can be withdrawn at any time without any notice. More or higher the ratio better it is.

Ratio of market liabilities to total assets: market liabilities may include money market borrowings, interbank liabilities repayable within a short period. Lower the ratio better it is.

Flow Approach to Measuring and Managing Liquidity is the basic approach being followed by Nepalese banks.It is called gap method of measuring and managing liquidity. It requires the preparation of structural liquidity gap report. The framework for assessing and managing bank liquidity through flow approach has three major dimensions that are measuring and managing net funding requirements, managing market access, and contingency planning.

In the method of measuring and managing net funding requirements the net funding requirement is calculated on the basis of residual maturities of assets and liabilities. Flow and inflow of cash in the future time buckets. These calculations are based on the part

behavior pattern of assets and liabilities as well as off balance sheet exposures. Cumulative gap is calculated at various time buckets. It shows that at a particular time after week/fortnight/month/quarter/half year/year cash outflow and inflow difference will be represented by gap. In case the gap is negative, the bank will have to manage the short fall through various sources according to the liquidity policy and strategy of the bank.

The analysis of net funding requirements involves the construction of a maturity ladder and the calculation of a cumulative net excess or deficit of funds at selected maturity dates. A bank's net funding requirements are determined by analyzing its future cash flows based on assumptions of the future behavior of assets, liabilities and off-balance-sheet items, and then calculating the cumulative net excess over the time frame for the liquidity assessment. These aspects will be elaborated under,the maturity ladder:A maturity ladder should be used to compare a bank's future cash inflows to its future cash outflows over a series of specified time periods. Cash inflows arise from maturing assets, saleable non-maturing assets and established credit lines that can be trapped. Cash outflows include liabilities falling due and contingent liabilities, especially committed lines of credit that can be drawn down.

In alternative Scenarios which involves evaluating whether a bank has sufficient liquidity depends in large measure on the behavior of cash flows under the different conditions. Analyzing liquidity thus entail slaying out what if scenarios.

Measuring liquidity over the chosen time frame is the evolution of a bank's liquidity profile under one or more scenarios can be tabulated or portrayed graphically, by cumulating the balance of expected cash inflows and cash outflows at several time points. A stylized liquidity graph can be constructed enabling the evolution of the cumulative net excess or deficit of funds to be compared under the three scenarios in order to provide further insights into a bank's liquidity and to check how consistent and realistic the assumptions are for the individual bank.

Assumptions used in determining cash flows isdone for the future scenarios and therefore, it is not always possible to predict with certainty as to what will happen in future. It all depends upon certain assumptions which require to be reviewed frequently to determine their continuing validity for making predictions for liquidity risk management.

Thus, it is important for a bank to review periodically its efforts to maintain the diversification of liabilities, to establish relationships with liability holders and to develop asset-sales markets.

In the contingency Planning a bank's ability to withstand a net funding requirement in a bank specific or general market liquidity crisis also depend on the caliber of its formal contingency plans. Effective contingency plans should address two major questions: Does the management have a strategy for handling a crisis? And does the management have procedures in place for accessing cash in emergency? The degree, to which a bank has addressed these questions realistically, provides management with additional insight as to how a bank may fare in a crisis.

Strategy for handling a crisis: A game plan for dealing with a crisis should consist of several components. Most important are those that involve managerial coordination. A contingency plan needs to spell out procedures to ensure that information flows timely and uninterrupted, and that the information flows provide the senior management with the precise information it needs in order to make quick decisions. A clear division of responsibility is set out so that all personnel understand what is expected of them during a crisis. Confusion in this area can waste resources on certain issues and omit coverage on others.

Another major element in the plan should be a strategy for taking certain actions to alter asset and liability behaviors. For example, a bank may conclude that it will suffer a liquidity deficit in a crisis based on its assumptions regarding the amount of future cash inflows from saleable assets and outflows from deposit run-offs. During such a crisis however, a bank may be able to market assets more aggressively, or sell assets that it would not have sold under normal conditions and thus augment its cash inflows from asset sales. Alternatively, it may try to reduce cash outflows by raising its deposit rates to retain deposits that might otherwise have moved elsewhere.

Back up liquidity for emergency situations ie contingency plans also include procedures for making up cash flow shortfalls in emergency situations. Banks have several sources of such funds, including previously unused credit facilities and the domestic central bank. Depending on the severity of a crisis, a bank may choose or be forced to use one or more

of these sources. The plan should spell out as clearly as possible the amount of funds a bank has available from these sources, and under what scenarios a bank could use them.

2.1.2.3The basel committee and NRB risk management guideline's principles of liquidity risk management

Fundamental principles for the management and supervision of liquidity risk.

Principle 1: A bank is responsible for the sound management of liquidity risk. A bank should establish a robust liquidity risk management framework that ensures it maintains sufficient liquidity, including a cushion of unencumbered, high quality liquid assets, to withstand a range of stress events, including those involving the loss or impairment of both unsecured and secured funding sources. Supervisors should assess the adequacy of both a bank's liquidity risk management frame-work and its liquidity position and should take prompt action if a bank is deficient in either area in order to protect depositors and to limit potential damage to the financial system.

Principle 2: A bank should clearly articulate a liquidity risk tolerance that is appropriate for its business strategy and its role in the financial system.

Principle 3: Senior management should develop a strategy, policies and practices to manage liquidity risk in accordance with the risk tolerance and to ensure that the bank maintains sufficient liquidity. Senior management should continuously review information on the bank's liquidity developments and report to the board of directors on a regular basis. A bank's board of directors should review and approve the strategy; policies and practices related to the management of liquidity at least annually and ensure that senior management manages liquidity risk effectively.

Principle 4: A bank should incorporate liquidity costs, benefits and risks in the internal pricing, performance measurement and new product approval process for all significant business activities (both on-and off-balance sheet), thereby aligning the risk-taking incentives of individual business lines with the liquidity risk exposures their activities create for the bank as a whole.

Principle 5: A bank should have a sound process for identifying, measuring, monitoring and controlling liquidity risk. This process should include a robust framework for

comprehensively projecting cash flows arising from assets, liabilities and off-balance sheet items over an appropriate set of time horizons.

Principle 6: A bank should actively monitor and control liquidity risk exposures and funding needs within and across legal entities, business lines and currencies, taking into account legal, regulatory and operational limitations to the transferability of liquidity.

Principle 7: A bank should establish a funding strategy that provides effective diversification in the sources and tenor of funding. It should maintain an ongoing presence in its chosen funding markets and strong relationships with funds providers to promote effective diversification of funding sources. A bank should regularly gauge its capacity to raise funds quickly from each source. It should identify the main factors that affect its ability to raise funds and monitor those factors closely to ensure that estimates of fund raising capacity remain valid.

Principle 8: A bank should actively manage its intraday liquidity positions and risks to meet payment and settlement obligations on a timely basis under both normal and stressed conditions and thus contribute to the smooth functioning of payment and settlement systems.

Principle 9: A bank should actively manage its collateral positions, differentiating between encumbered and unencumbered assets. A bank should monitor the legal entity and physical location where collateral is held and how it may be mobilized in a timely manner.

Principle 10: A bank should conduct stress tests on a regular basis for a variety of short-term and protracted institution-specific and market-wide stress scenarios individually and in combination to identify sources of potential liquidity strain and to ensure that current exposures remain in accordance with a bank's established liquidity risk tolerance. A bank should use stress test outcomes to adjust its liquidity risk management strategies, policies, and positions and to develop effective contingency plans.

Principle 11: A bank should have a formal contingency funding plan (CFP) that clearly sets out the strategies for addressing liquidity shortfalls in emergency situations. A CFP should outline policies to manage a range of stressenvironments, establish clear lines of

responsibility, include clear invocation and escalation procedures and be regularly tested and updated to ensure that it is operationally robust.

Principle 12: A bank should maintain a cushion of unencumbered, high quality liquid assets to be held as insurance against a range of liquidity stress scenarios, including those that involve the loss or impairment of unsecured and typically available secured funding sources. There should be no legal, regulatory or operational impediment to using these assets to obtain funding.

2.1.2.4 Measuringthe magnitude of liquidity risk in bank

The liquidity risk ratios analyzed in this study are

1. Ratio of core deposit to total assets
2. Ratio of total loans to total deposits
3. Ratio of time deposit to total deposits
4. Ratio of liquid assets to total assets
5. Ratio of prime asset to total assets
6. Ratio of short-term liabilities to liquid assets
7. Ratio of market liabilities to total assets
8. Ratio of short-term liabilities to total assets

2.2 Reviews of empirical literature

The study is carried out to examine and compare the credit risk and liquidity risk position holds by two banks and their magnitude according to Basel II accords and NRB regulation. The aim of this paper is to finding the risk management position of commercial bank of Nepal. The summary of major article on this subject matter is in the table below

Table 2.1

Review of empirical literature

Study	Major Findings
Pandya&Prajapati(2013)	➢ Identify the need of better technology for the better risk management. ➢ Determine the employee need in understanding the Basel II accord to have better knowledge of Risk and their effort for betterment in risk management.
Ravikant& Jain(2013)	➢ Observe the recoup of capital conservation buffer, would be difficult once it gets depleted. ➢ Observe how banks would find it attractive to further boost up the credit growth in order to reduce the impact of additional capitalrequirements.
Chandak(2013)	➢ Described credit and liquidity are the life blood of the economic activities. ➢ Noted that economic downturn in terms of poor performance of industry.
Murthy(2013)	➢ Opines that NPA is drain on profitability as much as it does not add anything to the profit ➢ Concluded that provisions are to be made ranging from 20% to 100% depending upon the categorization of assets
Srilatha(2011)	➢ Examined the trends of mergers and acquisitions of the banking sector in India. ➢ Analyzed the impact of merger on financial performance of the merged banks and the perception of TBI.
Satish(2011)	➢ The study focused on the overall riskiness of banks using the insolvency risk measure.
Kumari and Bhagyshree (2010)	➢ Focused on theoretical overview of credit risk management in banking sector. ➢ Explained in brief the components of credit risk, tools of credit risk management.
Sisodiya and Pemmaraju(2009)	➢ Banks have been classified into three categories based on their ownership group. ➢ Remarkable resilience even amidst the worst ever financial catastrophe that hit the global economy caused the collapse of several financial giants. ➢ Concluded that banks are ranked on the basis of CAMEL rating.
Safakli(2007)	➢ Extensive study of credit risk associated with the banking sector and found that the credit risk ratios were indicative and correlated the risk ratios with key macroeconomic indicators.
Bandi (2006)	➢ Observe that private sector banks in India using CAMEL model for effective credit risk management. ➢ Finding a difference between the public sector banks and private sector banks in implementing the parameters to manage credit risk and the performance.
Tondon (2006)	➢ impact of globalization on Nepalese banking. The study focused on the challenges in the banking sector and the roadmap ahead
Satishetal (2005)	➢ Study adopted CAMEL model to assess the performance of Indian banks ➢ Concluded be hitting the market to increase their capital and gearing up for the Basel-II norms.
Louberge and Schlesinger(2005)	➢ Propose a new method for credit risk allocation among economic agents. ➢ Shows how financial contracts might be redesigned to allow banks to manage

	the idiosyncratic component.
Pandey (2002)	➢ Study with the objectives to find out the impact of changes in NRB directives on the performance of the commercial banks, made his research on the impact on changes in new directive. ➢ Study on the organizational structure or management techniques applied for the proper implementation.
Regmi (2004)	➢ Study on credit practices of joint venture commercial bank, further study on the risk involved in creating credit can be made.
Muninarayanappa and Nirmala(2004)	➢ Study outlined the concept of credit risk management in banks determine the direction of bank's policies on credit risk management ➢ Ultimate aim should be to protect and improve the loan quality.
Bagchi(2003)	➢ Examined the credit risk management in banks, proper credit risk approach contributes in success of credit risk management system.
Ferguson(2001)	➢ Analyzed the models and judgments related to credit risk management
Bratanovic and Greuning(2000),	➢ Recommended that credit risk ratios can be used as a measure of the credit risk associated with the banking sector
Eichengreen and Arteta(2000	➢ Concluded that unsustainable boom in domestic credit is a robust cause of financial distress, macro-economic policies leading to rapid lending growth
Duffee and Zhou(1999)	➢ Studied the impact on banks due to the introduction of a market for credit derivatives; particularly, credit-default swaps.
Rao and Datta(1998)	➢ Study made an attempt to derive rating based on CAMEL Model, study concluded that Corporation Bank has the best rating
Froot and Stein(1998)	➢ Found that credit risk management through active loan purchase and sales activity affects banks investments in risky loans.
Rajagopal(1996)	➢ Attempt to study an overview of the bank's risk management and suggested a model for pricing the products based on credit risk assessment of the borrowers

Pandya&Prajapati(2013), in their research article concluded that the Indian Banking Industry requires a combination of new technologies, better processes of credit and risk appraisal, treasury management, product diversification, internal control and external regulations. There is a need for bank employees to have sufficient understanding of the Basel II accord in order to guide the banking growth rate in the positive direction and lack of understanding affects the banks negatively as these are the basis for any banking sector. The objective of the study is to find out the awareness level, as well as the perception among bank employees about the Basel-II norms, and also examines the efforts made by them for implementing it in their banks.

Ravikant&Jain(2013), in their article concluded that the capital conservation buffer (2.5%) stipulated by Basel III is simply a top up, over and above the stipulated capital levels of 8%. The study observed that on one hand, the recoup of capital conservation buffer, would be difficult once it gets depleted and on the other, the banks would find it

attractive to further boost up the credit growth in order to reduce the impact of additional capital requirements. The other adverse impacts of discretionary buffers would be upsetting the growth plans of the industry, caution among investors and effect on banks asset quality. On the contrary, the release of discretionary buffers is only leverage enhancing enabling factor and by itself does not amount to increase in cash flows and liquidity for credit growth. And, it would not positively impact the banking profitability either.

Chandak(2013), in the article described credit and liquidity are the life blood of the economic activities. Liquidity and Credit market imbalances can create crisis even when the economic fundamentals are strong. They trigger uncertainty which undermines the confidence in trade and industry. It is also noted that economic downturn in terms of poor performance of industry, export and rising NPAs are basically due to systematic imbalances in liquidity and credit environment.

Murthy(2013), carried out a study on "Non-performing assets" and opines that NPA is drain on profitability as much as it does not add anything to the profit but additionally bank had to incur expenses on account of follow-up, legal action and concessionary facilities in interest and charges and capital cost as long as the asset is on bank's books. Finally he concluded that provisions are to be made ranging from 20% to 100% depending upon the categorization of assets as sub-standard, doubtful or loss.

Srilatha(2011), in her M.Phil study examined the trends of mergers and acquisitions of the banking sector in India, analyzed the impact of merger on financial performance of the merged banks and the perception of TBI (Times Bank Limited) customers towards merger. It was concluded that the merger between TBL and HDFC has turned out to be heading towards achieving the objectives of the merger and the merger has been extremely beneficial to the customers.

Satish(2011), in his Doctoral thesis, made a comparative study of Risks in Public Sector Banks, Private sector Banks and Foreign Banks operating in India. The study focused on the overall riskiness of banks using the insolvency risk measure, Risk Index (Z). A comparison is made between each of the banking groups for each of the risks by applying inferential statistical tests like t-test, Kruskal-Wallis test. The size of the study is 80

Banks viz. SBI and its associates (7), Nationalized Banks (20), Private Banks (22) and Foreign Banks (31).

Kumari and Bhagyshree(2010), the article is a theoretical overview of credit risk management in banking sector. The study explained in brief the components of credit risk, tools of credit risk management, some of the risk rating models used worldwide and concluded that the principal difficulty with credit risk management models are, availability of sufficient data and that credit systems are only, as good as the quality of data behind them.

Sisodiya and Pemmaraju(2009), in their article concluded that the Indian banking has shown remarkable resilience even amidst the worst ever financial catastrophe that hit the global economy about a year ago and caused the collapse of several financial giants. The banks are ranked on the basis of CAMEL rating. For the purpose of the study, banks have been classified into three categories based on their ownership group; viz. public sector banks (PSBs), private sector banks and foreign banks. They analyzed 66 banks for the year 2008-09.

Safakli(2007),did an extensive study of credit risk associated with the banking sector of Northern Cypress and found that the credit risk ratios were indicative of the credit risks associated with the banking sector and correlated the risk ratios with key macroeconomic indicators.

Bandi(2006), in her Doctoral study examined the extent to which the select public and private sector banks implemented the guidelines given by the RBI on credit risk management, based on select parameters. The study also analyzed the performance of select public sector banks and private sector banks in India using CAMEL model for effective credit risk management. The study concluded that there is a difference between the public sector banks and private sector banks in implementing the parameters to manage credit risk and the performance of public sector banks is better than the private sector bank.

Tondon(2006), in his article, studied the impact of globalization on Nepalese banking. The study focused on the challenges in the banking sector and the roadmap ahead. He made comparisons of Nepalese banking system with China and rest of the world, in terms

of size, return on assets and non-performing assets. The study concluded that the growing international influence offers Nepalese banks three-fold benefit viz., the opportunity to render services to the cross border needs of Nepalese companies, serving the multinational for their banking needs and create its footprints globally.

Satishetal(2005), in their study adopted CAMEL model to assess the performance of Indian banks. The authors analyzed the performance of 55 banks for the year 2004-05, using CAMEL Model. They concluded that the Indian banking system looks sound and information Technology will help the banking system grow in strength while going into future. Banks Initial Public Offers (IPOs) will be hitting the market to increase their capital and gearing up for the Basel-II norms.

Louberge and Schlesinger(2005), aim to propose a new method for credit risk allocation among economic agents in their study. Their paper considers a pool of bank loans subject to credit risk and develops a method for decomposing the credit risk into idiosyncratic and systematic components. The paper shows how financial contracts might be redesigned to allow banks to manage the idiosyncratic component for their own account, while allowing systematic component to be retained, passed off to capital market or shared with borrower.

Pandey (2002) has carried out study with the objectives to find out the impact of changes in NRB directives on the performance of the commercial banks and to find out whether the directives were implemented or not. According to his findings the directives if not properly addressed have potential to wreck the financial system of the country. The directives in themselves are not that important unless properly implemented. The implementation part depends upon the commercial banks. In case commercial banks are making such huge profit with full compliance of NRB directives, then the commercial banks would deserve votes of praise because they would then be instrumental in the economic development of the country. Pandey has made his research on the impact on changes in new directives. In his study, he has studied only the provision related to loan provisioning and capital adequacy. However, besides Loan Loss Provision and capital adequacy, the other factors like concentration risk, sector-wise lending risk can further be discussed. A study on the organizational structure or management techniques applied for

the proper implementation of NRB directives and for management of credit risk can also be made.

Regmi (2004) conducted a thesis A study on credit practices of joint venture commercial banks with reference to Nepal SBI Bank Ltd. and Nepal Bangladesh Bank Ltd.To determine impact of deposit in liquidity and its effect on lending practices. This study is mainly focused on the lending practices and the volume of credit in comparison to the deposits. Therefore, the major gap in this research is study of the risk involved in the lending practices or the study of credit risk. Therefore, further study on the risk involved in creating credit can be made.

Muninarayanappa and Nirmala(2004), in their study outlined the concept of credit risk management in banks, the objectives and factors that determine the direction of bank's policies on credit risk management. The challenges related to internal and external factors in credit risk management are also highlighted. They concluded that success of credit risk management require maintenance of proper credit risk environment, credit strategy and policies. Thus the ultimate aim should be to protect and improve the loan quality.

Bagchi(2003), in his article examined the credit risk management in banks. He examined risk identification, risk measurement, risk monitoring, risk control and risk audit as basic considerations for credit risk management. The study concluded that proper credit risk architecture, policies and framework of credit risk management, credit rating system, monitoring and control contributes in success of credit risk management system.

Ferguson(2001), in his article analyzed the models and judgments related to credit risk management. The study concluded that proper risk modeling provides a formal systematic and disciplined way for firms to measure changes in the riskiness of their portfolio and help them in designing proper strategic framework for managing changes in their risk.

Bratanovic and Greuning(2000),recommended that credit risk ratios can be used as a measure of the credit risk associated with the banking sector and highlighted the usefulness of such ratios for banks to internally lower the ratio and avert any catastrophic failures.

Eichengreen and Arteta(2000), study concluded that unsustainable boom in domestic credit is a robust cause of financial distress, macro-economic policies leading to rapid lending growth and financial overheating generally set the stage for future problems. Domestic interest-rate liberalization is often accompanied by excessive lending activities. The study also concluded that there is little evidence of any particular relationship between exchange-rate regimes and banking crises; the role of the legal and regulatory framework is also uncertain.

Duffee and Zhou(1999), in their article studied the impact on banks due to the introduction of a market for credit derivatives; particularly, credit-default swaps. Their study examined that a bank can use swaps to temporarily transfer credit risks of their loans to others, reducing the likelihood that the defaulting loans trigger the bank's financial distress. They concluded that the introduction of a credit derivatives market is not desirable because it can cause other markets for loan risk-sharing to break down.

Rao and Datta(1998), in their study made an attempt to derive rating based on CAMEL Model. In their study, based on these five groups (C-A-M-E-L), 21 parameters in all were developed.

Froot and Stein(1998), in their article found that credit risk management through active loan purchase and sales activity affects banks' investments in risky loans. The study concluded that banks that purchase and sell loans hold more risky loans credit Risk and Loss loans and commercial real estate loans as a percentage of the balance sheet than other banks. Again, these findings are especially striking because banks that manage their credit risk by buying and selling loans hold more risky loans than banks that merely sell loans but don't buy them or banks that merely buy loans (but don't sell them).

Rajagopal(1996), in his article made an attempt to study an overview of the bank's risk management and suggested a model for pricing the products based on credit risk assessment of the borrowers. He concluded that good risk management is good banking, which ultimately leads to profitable survival of the institution. A proper approach to risk identification, measurement and control will safeguard the interests of banking institution in long run

2.3 Theoretical framework

The theoretical framework was used to help focus on the variable in the study. Banks uses the credit risk and liquidity risk measurement of magnitude to analysis of favorable and unfavorable position.

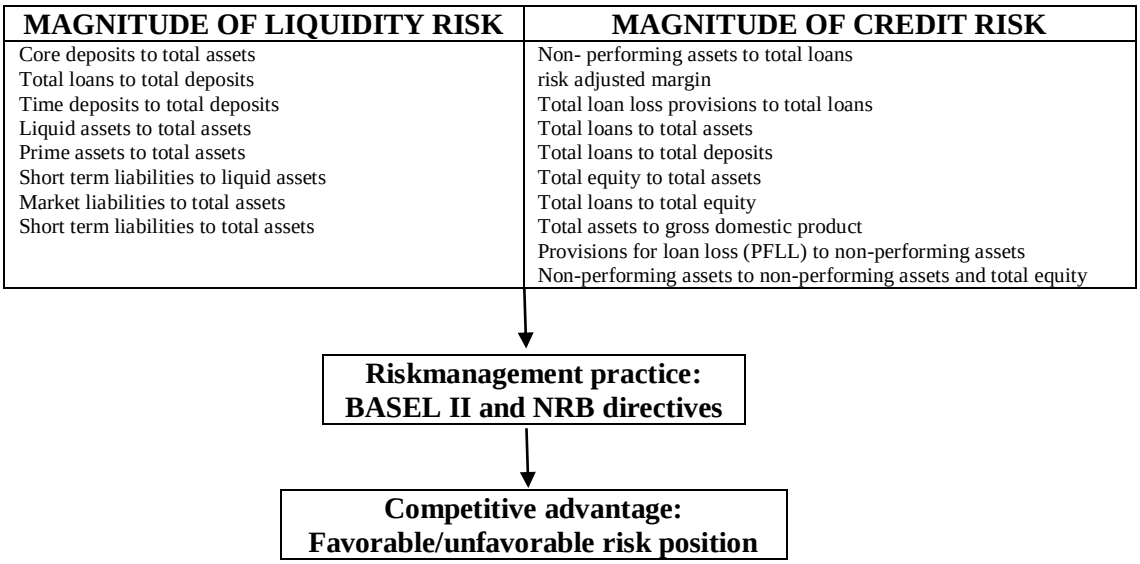

FIG 2.1 Theoretical framework of the study

2.4 Hypothesis

Against this backdrop, the study examined the following hypotheses

1. H_1: There is no significant difference between the ratio of non- performing assets to total loans of NIBL and NABIL bank.
2. H_2: There is no significant difference between the ratio of risk adjusted margin of NIBL and NABIL bank.
3. H_3: There is no significant difference between the ratio of total loan loss provisions to total loans of NIBL and NABIL bank.
4. H_4: There is no significant difference between the ratio of total loans to total assets of NIBL and NABIL bank.
5. H_5: There is no significant difference between the ratio of total loans to total deposits of NIBL and NABIL bank.

6. H_6: There is no significant difference between the ratio of total equity to total assets of NIBL and NABIL bank.

7. H_7: There is no significant difference between the ratio of Total loans to Total equity of NIBL and NABIL bank.

8. H_8: There is no significant difference between the ratio of total assets to gross domestic product of NIBL and NABIL bank.

9. H_9: There is no significant difference between the ratio of provisions for loan loss (PFLL) to Non-performing assets of NIBL and NABIL bank.

10. $H1_0$: There is no significant difference between the ratio of non-performing assets to Non-performing assets and total equity of NIBL and NABIL bank.

11. H_{11}: There is no significant difference between the ratio of core deposits to Total assets of NIBL and NABIL bank.

12. H_{12}: There is no significant difference between the ratio of total loans to total deposits of NIBL and NABIL bank.

13. H_{13}: There is no significant difference between the ratio of time deposits to total deposits of NIBL and NABIL bank.

14. H_{14}: There is no significant difference between the ratio of liquid assets to total assets of NIBL and NABIL bank.

15. H_{15}: There is no significant difference between the ratio of prime assets to total assets of NIBL and NABIL bank.

16. H_{16}: There is no significant difference between the ratio of short term liabilities to liquid assets of NIBL and NABIL bank.

17. H_{17}: There is no significant difference between the ratio of Market Liabilities to Total assets of NIBL and NABIL Bank.

18. H_{18}: There is no significant difference between the ratio of Short term liabilities to Total assets of NIBL and NABIL Bank.

CHAPTER III

RESEARCH METHODOLOGY

The research methodology is considered as blueprint of a research study which encompasses several research activities, description of procedures, formulations to access the growth and development and various other success-related factors. This enables to evaluate and assess the collected data, research methodology acts as a reference outline in order to make sure that the collection and evaluation of the collected information is appropriate to achieve the objective of the present study (Sekaran, 2003). The ultimate objective of the study is to scrutinize and validate the risk management methodologies in the commercial banks. The present study has adopted quantitative research techniques which help to determine whether risk management approaches would enable in fulfilling their objectives.Research Methodology in which we discuss the models and methods used to ascertain the relationship between bank management and the accounting performance of commercial banks of Nepal.

3.1 Research design

The present study is empirical and exploratory in nature. In order to study the risk management in banking sector, the aspects like; equity position, reserve position, deposit position, advance position, net profit position and branch position of banks in Nepal are taken into consideration. For the purpose of the study two banks are selected from private sector bank. This research follows research philosophy. The word research philosophy indicates the method adopted to gather, analyze and use the data. There are three types of research philosophy they are: Positivism, Interpretivism and Realism.

This study is the combination of descriptive and analytical type of research. Historical data are used to identify and analyze the risks of a bank in the past period. Similarly, management system, organizational structure and policies for mitigating the credit risk and the credit risk management procedures have been presented in descriptive form so as to identify the current status from which pitfalls can be identified. From collection of past data and information from key informants, the credit and liquidity risk management system has been analyzed and recommendations have been made for improving the risk

management of banks. Since only two banks have been selected for the study, this study is a comparative study between these two banks in credit and liquidity risk.

For the purpose of the study two banks are selected. To study the risk management in banking sector, CAR of selected banks operating in Nepal as per basel norm II is analyzed during the period 2010 to 2017. In the light of the NRB and basel norms, various credit risk ratios and liquidity risk ratios for the NIBL and NABIL banks have been studied and analyzed. A comparative study is also made between NIBL and NABIL bank.

3.2 Population and sample of study

The period of study covers a seven period i.e., from 2011 to 2017, NABIL AND NIBL banks annual reports for measuring the risk. In 2010 the NRB, banking supervision department issued the first draft guidelines on risk management guidelines with Basel II implementation in which an initial target date for basel II compliance was for all commercial banks. I use secondary sampling technique using annual report of banks. The main reason for choosing NIBL and NABIL Bank for this thesis propose are because these banks are Nepal's top commercial bank with comparatively similar competitor, in EPS and market value.

3.3Nature and sources of data

The study is based on secondary data. Secondary data are collected mainly from published sources like annual reports, prospectus, Internet and other sources. Secondary data published in the annual reports of concerned organizations are collected through personal visit in respective organization as well as from their web sites. All the annual report published is verified and approved through AGM of respective banks and also approved by NRB Since these annual reports were approved by concerned body the reports were considered authentic to be present in this research.

3.4 Methods of data analysis

The statistical tools such as percentages, averages, compound annual growth rate, annual growth rate, t-test and multiple regression analysis have been used to analyze the collected data. Data analysis is conducted by collected data registered into the excel

sheet. Descriptive analysis was conducted through evaluating the percentages, CAGR, mean, SD and the relationship between the definite variables were determined using the T test analysis and P Value Error testing.

3.4.1 Arithmetic mean

Arithmetic Mean has been widely used in this study. It has been used tocalculate the average for 9 years data in some cases for 7 and 6 years due tounavailability of complete data. This tool has been used to calculate the singlefigure that can represent the whole data for the period. The Arithmetic Mean ofloan, deposits, non-performing loan, loan loss provision etc. have beencalculated in this study. It is computed by using following formula:

$$Mean\ (X) = \in X/n$$

Where,

X = Mean, $\in X$ = Sum of all the Variable, n = Variables involved

3.4.2 Standard deviation

Standard Deviation is a tool to measure the risk. Standard Deviation has been used wherever the mean is calculated to study the deviation of the data from the mean. It has also been used as a measure to identify the risk. Higher the deviation greater the risk and vice versa. Mathematically, it is defined as the positive square root of their arithmetic mean of squares of the deviation of the given observations from their arithmetic mean of a set of value. Here, it is denoted by the letter sigma S.D. and (δ).

It can be computed by using following formula

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

Greater the magnitude of standard deviation, higher will be the fluctuation and vice versa.

3.4.3 Compound annual growth rate – CAGR

Compound annual growth rate is the rate of return that would be required for an investment to grow from its beginning balance to its ending balance, assuming the profits were reinvested at the end of each year of the investment's lifespan.

Formula and calculation of CAGR

$CAGR = [(EB / BB)^{1/n} - 1]$

where:

EB=Ending balance

BB=Beginning balance

n=Number of years

3.4.4 Hypothesis test

In this study, hypothesis test has been used as one of the important aspects of decision-making. It consists of decision rules required for drawing probabilistic inferences about the population parameter. Hypothesis is a quantitative statement about the population parameter, whereas hypothesis test is the act of verification of such statement. While testing a hypothesis, two complementary hypotheses are set up at one time. If one of the hypotheses is accepted, then the other hypothesis is rejected.

The two types of hypotheses include,

a. Null hypothesis: Null hypothesis is a statistical hypothesis made about the population parameter to test its validity for the purpose of possible acceptance. It is usually denoted by Ho or "H_0".

b. Alternative hypothesis:A complementary hypothesis to null hypothesis is called alternative hypothesis. In other words, a hypothesis test, which is set up against the null hypothesis, is called an alternative hypothesis. It is indicated by H_1.

3.4.5 T-test

A t-test is a type of inferential statistic used to determine if there is a significant difference between the means of two groups, which may be related in certain features. It is mostly used when the data sets, like the data set recorded as the outcome from flipping a coin 100 times, would follow a normal distribution and may have unknown variances. A t-test is used as a hypothesis testing tool, which allows testing of an assumption applicable to a population.

A t-test looks at the t-statistic, the t-distribution values, and the degrees of freedom to determine the probability of difference between two sets of data. To conduct a test with three or more variables, one must use an analysis of variance.

Equal variance (or pooled) T-test

The equal variance t-test is used when the number of samples in each group is the same, or the variance of the two data sets is similar. The following formula is used for calculating t-value and degrees of freedom for equal variance t-test:

$$\text{T-value} = \frac{mean1 - mean2}{\sqrt{\frac{(n1-1)\times var1^2+(n2-1)\times var2^2}{n1+n2-2}} \times \sqrt{\frac{1}{n1}+\frac{1}{n2}}}$$

where:

mean1 and mean2=Average values of eachof the sample sets

var1 and var2=Variance of each of the sample sets

n1 and n2=Number of records in each sample setand,

Degrees of Freedom=n1+n2−2

Where:n1 and n2=Number of records in each sample set

3.4.6 P-value

In statistics, the p-value is the probability of obtaining the observed results of a test, assuming that the null hypothesis is correct. It is the level of marginal significance within a statistical hypothesis test representing the probability of the occurrence of a given event. The p-value is used as an alternative to rejection points to provide the smallest level of significance at which the null hypothesis would be rejected. A smaller p-value means that there is stronger evidence in favor of the alternative hypothesis.

P-value approach to hypothesis testing

The p-value approach to hypothesis testing uses the calculated probability to determine whether there is evidence to reject the null hypothesis. The null hypothesis, also known as the conjecture, is the initial claim about a population of statistics.

Type I error

A type I error is the false rejection of the null hypothesis. The probability of a type I error occurring or rejecting the null hypothesis when it is true is equivalent to the critical value used. Conversely, the probability of accepting the null hypothesis when it is true is equivalent to 1 minus the critical value.

3.5 Limitation of the study

The following are the major limitations of the study.

1. The present study is confined to two banks, findings cannot be generalized.

2. The present study is confined to only credit risk management and liquidity risk management, though there are other risks associated with management of banks viz, operational risk management, interest rate risk management, exchange rate risk management etc.,

3. The present study period is limited to seven years only.

4. There are no universally accepted standards for measuring credit risk and liquidity risk of the banking institution. Benchmarks are not available for all credit risk ratios and liquidity risk ratios.

CHAPTER IV

DATA PRESENTATION AND ANALYSIS

4.1 Data presentation and analysis

This is the section where, the filtered data are presented and analyzed. This is one of the major chapters of this study because it includes detail analysis and interpretation of data from which concrete result can be obtained. This chapter consists of various calculation made for the analysis of credit risks and liquidity risk of the sample banks. To make our study effective, precise and easily understandable, this chapter is categorized in three parts; presentation, analysis and interpretation. The analysis is fully based on secondary data. Data are presented in terms of tables and comparative analysis using hypothetical testing. The presented data are then analyzed using different statistical tools mentioned in chapter three. At last the results of analysis are interpreted.

4.1.1 Ratio of non- performing assets (NPA) to total loans (TL)

This ratio indicates the percentage of NPA's to the total loans advanced and helps to identify the quality of assets that a bank possesses. And how much of the loan portfolio is non-performing. Non- performing assets are those assets that cease to generate income. Accumulation of NPA's affects the profitability and solvency of banks. Gross NPA to Gross Advances ratio is used to ascertain whether NPA's of the banks are increasing i.e. whether the bank is adding a fresh stock of bad debts. If the ratio tends to increase, it means that the bank is either offering loans without verifying the financial capability of the borrowers or not exercising adequate recovery measures. The lower this ratio better it is, because high NPA's bring in credit risk for the bank. This ratio is calculated using the following formula

Non-performing assets (NPA) / Total loans

An Asset, including a leased asset, becomes non-performing when it ceases to generate income for the bank. NPA are those assets for which interest is overdue for more than 90 days or 3 months.

NPA is Gross NPA's of bank and total loans means loans and advances outstanding as on the date of balance sheet. The international standard for the ratio of non-performing assets to total loans is 2 percent to 3 percent.

The details of non-performing assets, total loans and the ratio of non-performing assets to total loans (NPA to TL) of NIBL and NABIL Bank the period of study 2010-11 to 2016-17 are presented in table 4.1.

Table 4.1

Ratio of non- performing assets (NPA) to total loans (TL)

YEAR	NON-PERFORMING ASSETS				TOTAL LOANS				NPA/TL (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	39.53		68.99		4188.77		3890.55		0.94	1.77
2011/12	14.25	-63.94	100.01	44.97	4290.67	2.43	4286.78	10.18	0.33	2.33
2012/13	91.31	540.59	101.52	1.51	4640.01	8.14	4636.98	8.17	1.97	2.19
2013/14	94.71	3.73	125.61	23.73	5345.85	15.21	5469.16	17.95	1.77	2.30
2014/15	84.41	-10.87	122.08	-2.81	6769.02	26.62	6716.17	22.80	1.25	1.82
2015/16	59.30	-29.75	88.90	-27.18	8700.98	28.54	7773.04	15.74	0.68	1.14
2016/17	88.82	49.78	72.81	-18.11	10668.39	22.61	9149.13	17.70	0.83	0.80
CAGR		69.93		3.16		14.79		13.22	1.11	1.76

It can be observed from the table 4.1 that, the value of non-performing assets of NIBL Bank increased from Rs.39.53crores to Rs.88.82crores, while the total loans increased from Rs.4188.77crores to Rs.10668.39crores during the study period 2010-11 to 2016-17.Alongside the value of non-performing assets of NABIL Bank increased from Rs.68.99crores to Rs.72.81crores, while the total loans increased from Rs.3890.55crores to Rs.9149.13crores during the study period 2010-11 to 2016-17.

It is also observed that the ratio of non-performing assets to total loans of NIBL Bank decreased from 0.94 percent 2010-11 to 0.83 percent 2016-17 meanwhile NABIL bank ratio from 1.77 percent 2010-11 to 0.80 percent 2016-17. This indicates that the credit risk of of both NIBL and NABIL bank decreased during the study period. Although both bankshave significantly increased the ration up to period 2013-14 and gradually decrease

their ration. It shows that the quality of assets that a bank possesses is increasing every year. The ratio of non-performing assets to total loans of both bank shows increasing trend up to year 2013-14 thendecreasingtrend during the study period. The increase in the ratio is due to increase in NPA's and vice-versa. This implies that the bank is either offering loans without verifying the financial capability of the borrowers or not exercising adequate recovery measuresupto 2013-14.

The ratio of Non- performing assets to total loans of both NIBL and NABIL banks is below the international standard, 2 percent to 3 percent during the study period.

4.1.2 Ratio of risk adjusted margin (RAM)

Risk adjusted margin is a measure which shows the impact of credit risk on the profitability of the bank. Specifically, it is calculated as net interest income plus other income minus provisions made during the year for loan losses divided by assets. When compared with the net interest margin (NIM) figure RAM shows the impact of loan losses on the bank. RAM rather than NIM is a true reflection of the risk management abilities of the bank, because it shows the spread (or margin) net of loan loss provisions. Further it shows the risk faced by the bank in the process of managing its credit portfolio. If one were to measure a bank's management abilities only using NIM it would show only the interest income generation net of interest expense but it would not show the attendant risks. A bank can increase its NIM by giving high interest loans, but if the high interest loans carry a higher risk this would not get reflected in NIM. On the other hand RAM reflects this risk to the extent higher risk results in higher provisions. Therefore, higher this ratio better it is.

(Net interest income + other income – provision for credit losses) / Total assets

RAM indicates the risk faced by the Bank in the process of managing its credit portfolio.

The details of net interest income, other income, and provision for non-performing assets, total asset, and the ratio of risk adjusted margin of NIBL and NABILBank for the period of study 2010-11 to 2016-17 are presented in table 4.2.

Table 4.2

Ratio of risk adjusted margin (RAM)

YEAR	NIBL				NABIL				RAM	
	NET INTEREST INCOME	OTHER INCOME	PROVISION FOR NPA	TOTAL ASSETS	NET INTEREST INCOME	OTHER INCOME	PROVISION FOR NPA	TOTAL ASSETS	NIBL	NABIL
2010/11	580.34	65.05	37.13	5835.68	525.40	75.04	53.60	5814.14	10.42	9.41
2011/12	598.26	74.16	85.36	6575.62	613.37	101.22	87.72	6320.03	8.93	9.92
2012/13	587.83	90.00	88.43	7315.22	570.21	109.20	85.53	7324.13	8.06	8.11
2013/14	581.63	115.02	94.71	8617.39	563.62	125.70	104.41	8727.46	6.99	6.70
2014/15	578.62	119.00	82.11	10434.54	576.23	123.32	110.93	11598.57	5.90	5.07
2015/16	677.68	144.00	92.80	12978.27	615.57	140.37	98.89	12730.02	5.62	5.16
2016/17	924.87	182.14	123.02	15081.80	806.56	160.92	86.42	14033.21	6.52	6.28
CAGR	564.13	103.47	80.92	8714.69	535.08	108.68	81.98	8676.20	7.49	7.24

It can be observed from the table 4.2 that, the value of net interest income of NIBL bank recorded an increasing trend and almost doubleandNABIL bank recorded an increasing trend and 1.5 times(approximately) during the study period 2010-11 to 2016-17. The net interest income (NII) of NIBL bank increased from Rs.580.34crores in 2010-11 to Rs.924.87crores in 2016-17 while of NABIL bank increase form Rs.525.40crores in 2010-11 to Rs.806.5crores in 2016-17. The value of other income earned by the NIBLBank increased during the study period, the other income earned by the bank is Rs.65.05crores in 2010-11 and in 2016-17 it is Rs.182.14croreswhile NABIL bank also increases the other income earned to Rs. 75.04 crores to Rs. 160.92 crores in study period. The value of net interest income of both bank increased due to higher growth in the advances and investment portfolios.

The value of provision for NPA's of NIBL bank increased from Rs. 37.13 crores(2010-11) to Rs. 123.2 crores(2016-17) and NABIL bank increases its NPA's from RS. 53.6 crores(2010-11) to Rs. 110.93 crores(2014-15) then decreases to Rs. 86.42 crores(2016-17). The value of total assets of the NIBL increased from Rs. 5835.68 crores to Rs. 15081.80 crores alongside NABIL bank increased Total assets from Rs. 5814.14 crores to Rs. 14033.21 crores during the study period 20010-11 to 2016-17. The percentage increase in the value of total assets of both bank are gradually increased in the study

period. Total assets increased mainly due to increase in loan portfolio and investments and both bank reputation on market management.

It can also be observed from table 4.2 that, the ratio of risk adjusted margin ofbothNIBL and NABIL bank recorded a decreasing trend during the study period. In NIBL bank during the period 2010-11 to 2015-16the ratio decreased from 10.42 percent to 5.62 percent and increase to 6.52 percent in 2016-17. While in NABIL bank during the period 2010-11 to 2015-16the ratio decreased from 9.41 percent to 5.16 percent and increase to 6.28 percent in 2016-17. The ratio is decreasing during the study period, which is a due to significant increase in total assets of both banks while the income and provision are not increased in same ratio which is not good sign.

4.1.3 Ratio of total loan loss provision (LLP) to total loans (TL)

This ratio shows the percentage of total loan loss provision of the bank to its total loans. The lower the ratio the better for the bank risk minimization. It is calculated as under:

Total loan loss provision / Total loans

The details of total loan loss provision, total loans and the ratio of total loan loss provision to total loans of NIBL and NABIL bank for the study period 2010-11 to 2016-17 are presented in table 4.3.

Table 4.3

Ratio of total loan loss provision (LLP) to total loans (TL)

YEAR	TOTAL LOAN LOSS PROVISIONS				TOTAL LOANS				TLLP/TL (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	79.2		87.1		4188.8		3890.5		1.89	2.24
2011/12	127.0	60.3	126.2	44.8	4290.7	2.4	4286.8	10.2	2.96	2.94
2012/13	130.1	2.4	127.6	1.1	4640.0	8.1	4637.0	8.2	2.80	2.74
2013/14	143.9	10.6	151.1	18.5	5345.8	15.2	5469.2	17.9	2.69	2.75
2014/15	147.1	2.2	166.0	9.8	6769.0	26.6	6716.2	22.8	2.17	2.76
2015/16	154.9	5.3	162.4	-2.1	8701.0	28.5	7773.0	15.7	1.78	2.09
2016/17	205.9	33.0	161.4	-0.6	10668.4	22.6	9149.1	17.7	1.93	1.76
CAGR		16.25889		10.2063		14.794		13.22	2.32	2.43

It is evident from table 4.3 that, the value of total loan loss provision of NIBL bank increased from Rs. 79.2 crores to Rs. 205.9 crores with CAGR 16.25 percent and total loans from Rs. 4188.8 crores to Rs. 10668.4 crores with CAGR 14.79 percent while NABIL bank increased from Rs. 87.1 crores to Rs. 161.4 crores with CAGR 10.2 percent and total loans from Rs. 3890.5 crores to Rs. 9149.1 crores with CAGR 13.22 percent during the study period 2010-11 to 2016-17.

The ratio of total loan loss provision to total loans of NIBLbank mix trend of (1.89,2.96,2.8,2.69,2.17,1.78,1.93)percent in 2010-11 to 2016- 17 with CAGR 2.32 percent and NABIL Bank of (2.24,2.94,2.74,2.75,2.76,2.09,1.76)percent in 2010-11 to 2016- 17 with CAGR 2.43percentduring the study period. This ratio when combined with the ratio of non-performing assets to total loans indicates that the credit risk position of the bank increased during the study period because higher ratio indicates higher risk.

4.1.4 Ratio of total loans (TL) to total assets (TA)

The loans to assets ratio measure the total loans outstanding as a percentage of total assets. A high ratio of advances to assets would mean that the chances of non-performing assets formation are also high, which is not a good scenario for a bank. This would mean the credibility of its assets would go down. The higher the ratio is, the more risky.The ideal ratio for total loans (TL) to total assets (TA) as per the NRB is 60 to 65 percent. This ratio is determined as follows:

Total loans to total assets = Total loans / Total assets

The ratio of Total Loan to Total assets Ratio represents the financial position of the bank and the bank's ability to meet all its financial requirements. It shows the percentage of a bank's assets that are financed with loans and other financial obligations that last over a year. As this ratio is calculated yearly, decrease in the ratio would denote that the bank is faring well, and is less dependent on debts for their business needs.

The details of total loans, total assets and the ratio of total loans to total assets of NIBL and NABIL bank for the period of study 2010-11 to 2016-17 are presented in table 4.4.

Table 4.4

Ratio of total loans (TL) to total assets (TA)

YEAR	TOTAL LOANS				TOTAL ASSETS				TLLP/TL (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	4188.77		3890.55		5835.68		5814.14		71.78	66.92
2011/12	4290.67	2.43	4286.78	10.18	6575.62	12.68	6320.03	8.70	65.25	67.83
2012/13	4640.01	8.14	4636.98	8.17	7315.22	11.25	7324.13	15.89	63.43	63.31
2013/14	5345.85	15.21	5469.16	17.95	8617.39	17.80	8727.46	19.16	62.04	62.67
2014/15	6769.02	26.62	6716.17	22.80	10434.54	21.09	11598.57	32.90	64.87	57.91
2015/16	8700.98	28.54	7773.04	15.74	12978.27	24.38	12730.02	9.76	67.04	61.06
2016/17	10668.39	22.61	9149.13	17.70	15081.80	16.21	14033.21	10.24	70.74	65.20
CAGR		14.79		13.22		14.77		13.81	66.45	63.55

It can be observed from the table 4.4that, the value of total loans of NIBL increased from Rs. 4188.77 crores to Rs. 10668.39 crores with CAGR 14.79 percent, while total assets increased from Rs. 5835.68 crores to Rs. 15081.80 crores with CAGR 14.77 percent while the value of total loans of NABIL increased from Rs. 3890.55 crores to Rs. 9149.13 crores with CAGR 13.22 percent, while total assets increased from Rs. 5814.14 crores to Rs. 14033.21 crores with CAGR 13.81percentduring the study period 2010-11 to 2016-17. The growth in advances was due to growth in every segment in advances portfolio and total assets increased mainly due to increase in loan portfolio and investments.

It can also be observed from the above table that, the ratio of the both bankshadmix trend.In Case of NIBL Bank the trend is (71.78,65.25,63.43,62.04,64.87,67.04,70.74) and for NABIL Bank (66.92,67.83,63.31,62.67,57.91,61.06,65.02) in the period of study. This indicates that the credit risk position of both bankdecreased because a high ratio of Total loans to Total assets would mean that the chances of non-performing assets formation are also high.In case of NIBL bank FY 2016-17 the ratio had increased to 70.74 percent. It shows that the quality of assets that a bank possesses is diminishing. total loans to total assets (TL/TA) ratio of NIBL bank is below the desired level 60 to 65 percent during 2010-11 to 2009-10 and above the desired level in 2016-17. It is only in 2012-13 to 2014-15 the ratio is as desired by the NRB in NIBL bank and for NABIL

bank 2012-13, 2013-14 and 2015-16. Hence, the bank is required to take utmost care while giving loans.

4.1.5 Ratio of total loans (TL) to total deposits (TD)

This ratio is also known as the LTD ratio, is a ratio between the banks total loans and Total deposits. It is the ratio of how much a bank lends out of the deposits it has mobilized. A higher ratio indicates more reliance on deposits for lending and vice-versa. If the ratio is lower than one, the bank relied on its own deposits to make loans to its customers, without any outside borrowing. On the other hand, the ratio is greater than one, the bank borrowed money which it re-loaned at higher rates, rather than relying entirely on its own deposits. Banks may not be earning an optimal return if the ratio is too low. If the ratio is too high, the banks might not have enough liquidity to cover any unforeseen funding requirements.

The higher the ratio, the higher the loan-assets created from deposits. Deposits would be in the form of current and saving account as well as term deposits. The outcome of this ratio reflects the ability of the bank to make optimal use of the available resources**.**The ideal ratio of TL/TD is 65 to 75 percent.

The details of total loans, total deposit and the ratio of total loans to total deposit (TL/TD) of NIBL and NABIL bank for the period of study 2010-11 to 2016-17 are presented in table 4.5.

Table 4.5

Ratio of total loans (TL) to total deposits (TD)

YEAR	TOTAL LOANS				TOTAL DEPOSIT				TLLP/TL (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	4188.77		3890.55		5013.81		4969.61		83.54	78.29
2011/12	4290.67	2.43	4286.78	10.18	5701.06	13.71	5502.37	10.72	75.26	77.91
2012/13	4640.01	8.14	4636.98	8.17	6242.88	9.50	6360.98	15.60	74.32	72.90
2013/14	5345.85	15.21	5469.16	17.95	7383.14	18.26	7538.88	18.52	72.41	72.55
2014/15	6769.02	26.62	6716.17	22.80	9063.15	22.75	10423.79	38.27	74.69	64.43
2015/16	8700.98	28.54	7773.04	15.74	10862.66	19.86	11026.73	5.78	80.10	70.49
2016/17	10668.39	22.61	9149.13	17.70	12566.94	15.69	11889.62	7.83	84.89	76.95
CAGR		14.79		13.22		14.25		13.82	77.9	73.36

It is observed from table 4.5 that, the total loans and total deposits of NIBL increased from Rs. 4188.77 crores to Rs. 10668.39 crores with 14.79 percent CAGR and from Rs. 5013.81 crores to Rs. 12566.94 crores with CAGR 14.25 percent respectively alongside NABIL increased from Rs. 3890.55 crores to Rs. 9149.13 crores with 13.22 percent CAGR and from Rs. 4969.61 crores to Rs. 11899.62 crores with CAGR 13.82 percent respectively during the study period 2010-11 to 2016-17. In 2016-17, the deposits of the bank increased with an annual growth of 22.61 percent and 17.70 percent respectively and this could be achieved due to wide reach covering all strata of society and the trust of the people.

It can be observed from the table that, the ratio of total loans to total deposits (TL/TD) In case of NIBL bank risk had been higher to the ideal ratio in 83.54 percent in year 2010-11, 80.10 percent in 2015-16, 84.89 percent in 2016-17 while NABIL bank has maintain credit risk position in near ideal ratio during the study period. Since the ratio is lower than one, the bank relied on its own deposits to make loans to its customers, without any outside borrowing. Banks may not be earning an optimal return if the ratio is too low. The ratio reflects that the bank made optimal use of the available resources and the bank created more loan assets from its deposits.

From credit risk point of view it is not favorable as the ratio is above the Ideal ratio65 to 75 percent. For both banks as its ideal ratio in 2011-12 to 2012-13 which is best period.

4.1.6 Ratio of total equity (TE) to total assets (TA)

This ratio is used to help determine how much shareholders would receive in the event of a bank-wide liquidation. The ratio expressed in percentage, is calculated by dividing total shareholders' equity by total assets of the bank, and it represents the amount of assets on which shareholders have a residual claim. The figures used to calculate the ratio are taken from the bank’s balance sheet.

Shareholder equity ratio = Total shareholder equity / Total assets

Maintaining a high ratio of equity to total assets provides a degree of protection against the risk that interest payments will exceed earnings, particularly, for banks that generate their earnings from interest on loans. The equity to assets ratio indicates the finance and

profitability of the bank. It shows what proportion of total assets is financed by equity, and hence, what proportion is financed by loans and non-equity shares. A low equity to assets ratio means much of the business is financed by loans, or non-equity shares, whereas a high equity to assets ratio means that most or all of the long-term capital is equity. Under the same conditions, the more higher, the better, it shows the good finance and profitability.

The details of total equity, total assets and the ratio of total equity to total assets of NIBL and NABIL bank for the period of study 2010-11 to 2016-17 are presented in table 4.6.

Table4.6

Ratio of total equity (TE) to total assets (TA)

YEAR	TOTAL EQUITY				TOTAL ASSETS				TLLP/TL (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	515.98		457.21		5835.68		5814.14		8.84	7.86
2011/12	604.99	17.25	545.09	19.22	6575.62	12.68	6320.03	8.70	9.20	8.62
2012/13	702.06	16.04	668.91	22.72	7315.22	11.25	7324.13	15.89	9.60	9.13
2013/14	792.55	12.89	764.11	14.23	8617.39	17.80	8727.46	19.16	9.20	8.76
2014/15	980.70	23.74	948.56	24.14	10434.54	21.09	11598.57	32.90	9.40	8.18
2015/16	1628.78	66.08	1159.31	22.22	12978.27	24.38	12730.02	9.76	12.55	9.11
2016/17	1870.79	14.86	1409.48	21.58	15081.80	16.21	14033.21	10.24	12.40	10.04
CAGR		21.55		17.73		14.77		13.81	10.2	8.815

It is observed from table 4.6 that, the value of total equity and total assets of both NIBL and NABIL banks increased during the study period 2010-11 to 2016-17. The total equity of the bank increased from Rs. 515.98 crores to Rs. 1870.79 crores with CAGR 21.55 percent and total assets increased from Rs. 5835.68 crores to Rs.15081.80crores with CAGR 14.77 percent and from Rs. 457.21 crores to Rs. 1409.48 crores with CAGR 17.73 percent and total assets increased from Rs. 5814.14 crores to Rs. 14033.21 crores with CAGR 13.81 respectively percent during the study period.

It is also observed that, the ratio of total equity to total assets of both NIBL and NABIL Bank has a consistent upwardtrend during the study period. The ratio of NIBL and NABIL banks increase from 8.84 percent in 2010-11 to 12.40 percent in 2016-17 and

7.86 percent in 2010-11 to 10.04 percent in 2016-17 respectively. This indicates that the credit risk position of the bank is favorable for the following reasons.

A high ratio provides a degree of protection against the risk that interest payments will exceed earnings, hence a high ratio provides high degree of protection against risk and, a High ratio indicates that much of the business is financed by deposits or equity shares.

4.1.7 Ratio of total loans (TL) to total equity (TE)

The ratio of total loans to total equity is another indicator of credit risk, clarifying the capacity of bank capital to absorb the loan losses. Increase in this ratio indicates the deterioration in the capacity of bank capital to absorb the loan losses. This ratio is determined as follows

Total loan / Total equity

The details of total loans, total equity and the ratio of total loans to total equity of NIBL and NABIL bank for the period of study 2010-11 to 2016-17 are presented in table 4.7.

Table 4.7

Ratio of total loans (TL) to total equity (TE)

YEAR	TOTAL LOANS				TOTAL EQUITY				TL/TE (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	4188.77		3890.55		515.98		457.21		811.81	850.94
2011/12	4290.67	2.43	4286.78	10.18	604.99	17.25	545.09	19.22	709.21	786.44
2012/13	4640.01	8.14	4636.98	8.17	702.06	16.04	668.91	22.72	660.91	693.21
2013/14	5345.85	15.21	5469.16	17.95	792.55	12.89	764.11	14.23	674.51	715.76
2014/15	6769.02	26.62	6716.17	22.80	980.70	23.74	948.56	24.14	690.23	708.04
2015/16	8700.98	28.54	7773.04	15.74	1628.78	66.08	1159.31	22.22	534.20	670.49
2016/17	10668.39	22.61	9149.13	17.70	1870.79	14.86	1409.48	21.58	570.26	649.11
CAGR		14.79		13.22		21.55		17.73	664.45	724.86

It can be observed from table 4.7 that the value of total loans of both NIBL and NABIL bank increased from Rs. 4188.77 crores to Rs. 10668.39 crores with CAGR 14.79 percent and total equity increased from Rs. 515.98 crores to Rs. 1870.79 crores with CAGR 21.55 percent and from Rs. 3890.55 crores to Rs. 9149.13 crores with CAGR 13.22

percent and total equity increased from Rs. 457.21 crores to Rs. 1409.48 crores with CAGR 17.73 percent respectively during the study period 2010-11 to 2016-17. The increase in total loans could be due to the measures taken by NRB to offset the effects of the financial recession that occurred elsewhere in the world.

It may also be observed that the ratio of total loans to total equity of NIBL and NABIL banks show a significant decreasing during the period under study. The decreasing trend of the ratio indicates the improvement in the capacity of bank's capital to absorb the loan losses and it should be monitored risk associated to the volume of the loans for further improvement.

4.1.8 Ratio of total assets (TA) to gross domestic product (GDP)

This ratio measures the contribution of total assets of the bank towards gross domestic product of the country. It is a measure of the performance of the bank at a particular level of activity of the economy. This ratio is determined as follows:

Total assets / GDP

The details of total assets, gross domestic product and the ratio of total assets to Gross Domestic Product of NIBL and NABIL Bank the period of study 2010-11 to 2016-17 are presented in table 4.8.

Table 4.8

Ratio of total assets (TA) to gross domestic product (GDP)

YEAR	TOTAL ASSETS		GDP	TA/GDP (%)	
	NIBL	NABIL			
	Rs.	Rs.		NIBL	NABIL
2010/11	5835.68	5814.14	136695.41	4.27	4.25
2011/12	6575.62	6320.03	152734.36	4.31	4.14
2012/13	7315.22	7324.13	169501.11	4.32	4.32
2013/14	8617.39	8727.46	196453.96	4.39	4.44
2014/15	10434.54	11598.57	213014.96	4.90	5.44
2015/16	12978.27	12730.02	225316.31	5.76	5.65
2016/17	15081.80	14033.21	264259.53	5.71	5.31
CAGR	8714.69	8676.20	174468.60	4.81	4.79

From the table 4.8 it is observed that, the value of total assets of NIBL bank and NABIL bank increased from Rs. 5835.68 crores to Rs. 15081.80 crores with CAGR of 14.77 percent and Rs 5814.14 crores to Rs. 14033.21 crores with CAGR 13.44 percent restrictively and GDP of the country increased from Rs. 136695.41 crores to Rs. 264259.53 crores with CAGR 10.00 percent during the study period.

4.1.9 Ratio of provisions for loan loss (PFLL) to non-performing assets (NPA)

This ratio indicates the degree of safety measure adopted by the bank as it has direct bearing on the profitability, dividend and safety of shareholders' funds. If the ratio is low it indicates that bank has not made adequate provision for probable loan loss. If the ratio is high it indicates that the bank has, had made adequate provision against probable loan loss.

The details of provision for loan loss, non-performing assets and the ratio of Provisions for loan loss to Non-performing assets of NIBL and NABIL Bank for the period of study 2010-11 to 2016-17 are presented in table 4.9.

Table 4.9

Ratio of provisions for loan loss (PFLL) to non-performing assets (NPA)

YEAR	PROVISION FOR LOAN LOSS				NON-PERFORMING ASSETS				PLL/NPA (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	79.2		87.1		39.5		69.0		200.4	126.3
2011/12	127.0	60.3	126.2	44.8	14.3	-63.9	100.0	45.0	890.8	126.2
2012/13	130.1	2.4	127.6	1.1	91.3	540.6	101.5	1.5	142.4	125.7
2013/14	143.9	10.6	151.1	18.5	94.7	3.7	125.6	23.7	151.9	120.3
2014/15	147.1	2.2	166.0	9.8	84.4	-10.9	122.1	-2.8	174.3	136.0
2015/16	154.9	5.3	162.4	-2.1	59.3	-29.8	88.9	-27.2	261.2	182.7
2016/17	205.9	33.0	161.4	-0.6	88.8	49.8	72.8	-18.1	231.8	221.7
CAGR		16.3		10.2		69.9		3.2	293.4	148.8

It can be observed from table 4.9 that the value of provision for loan loss of NIBL bank has increased from Rs. 79.2 crores to Rs. 205.9 crores and non-performing assets increased from Rs. 39.5 crores to Rs. 88.8 crores while NABIL bankhas increased from Rs. 87.1 crores to Rs. 161.4 crores and non-performing assets increased from Rs. 69.0

crores to Rs. 72.8 crores during the study period 2010-11 to 2016-17. Internationally, provision coverage ratio is 70 to 80 percent.

During the study period the ratio of both NIBL and NABIL bank isabove the provision coverage and is in the international norm. This indicates that the bank has made adequate provision for NPA's as such the credit risk position of the bank is favorable position.

4.1.10Ratio of non-performing assets (NPA) to NPA and total equity (NPA + TE)

It is another measure of evaluation of credit risk position of the bank. It establishes the relationship between non-performing assets and non-performing assets and equity. Lower the ratio, lower the credit risk ratio. For the purpose of analysis equity means capital in the balance sheet on a particular date. The ratio is calculated as follows

Non-performing assets / Non-performing assets and Total equity

The details of non-performing assets, total equity and the ratio of non-performing assets to NPA and total equity of NIBL and NABIL bank for the period of study 2010-11 to 2016-17 are presented in table 4.10.

Table 4.10

Ratio of non-performing assets to NPA and total equity

YEAR	NON-PERFORMING ASSETS				NPA& EQUITY				PLL/NPA (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	39.5		69.0		555.5		557.2		7.12	12.38
2011/12	14.3	-63.9	100.0	45.0	619.2	11.5	646.6	16.0	2.30	15.47
2012/13	91.3	540.6	101.5	1.5	793.4	28.1	794.5	22.9	11.51	12.78
2013/14	94.7	3.7	125.6	23.7	887.3	11.8	886.2	11.5	10.67	14.17
2014/15	84.4	-10.9	122.1	-2.8	1065.1	20.0	1037.5	17.1	7.93	11.77
2015/16	59.3	-29.8	88.9	-27.2	1688.1	58.5	1232.1	18.8	3.51	7.22
2016/17	88.8	49.8	72.8	-18.1	1959.6	16.1	1409.5	14.4	4.53	5.17
CAGR		69.9		3.2		20.9		14.4	6.8	11.28

It can be observed from table 4.10 that the value of non-performing assets of NIBL bank increased from Rs. 39.5 crores in 2010-11 to Rs. 88.8 crores in 2016-17 and non-performing assets and equity of NIBL increased Rs. 555.5 crores in 2010-11 to Rs. 1959.6 crores in 2016-17, while NABIL bank has increased from Rs. 69.0 crores in 2010-

11 to Rs. 72.8 crores in 2016-17 and non-performing assets and equity of NIBL increased Rs. 557.2 crores in 2010-11 to Rs. 1409.5 crores in 2016-17during the study period. Both the bank has decreased the ratio in case of NIBL bank from 7.12 percent in 2010-11 to 4.53 percent in 2016-17 and NABIL bank decrease 12.38 percent in 2010-11 to 5.17 percent. This indicates that the credit risk position of the bank is favorable.

4.1.11 Ratio of core deposit to total assets

Core deposits are treated to be the stable source of liquidity. Core deposits constitute deposits from the public in the normal course of business. Total assets mean total assets appearing in the Balance sheet as on a particular date. This ratio is calculated as follows:

Core deposits (demand deposits+ saving deposits+ term deposits) / Total assets

Higher the ratio better is the liquidity position of the bank. The indicative ratio of core deposits to total assets for a bank is 50%.

The details of total deposits, total assets, and the ratio of total deposits to total assets of NIBL and NABIL bank for the period of study 2010-11 to 2016-17 are presented in table 4.11

Table 4.11

Ratio of core deposit to total assets

YEAR	CORE DEPOSIT				TOTAL ASSETS				CD/TA (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	5013.8		4969.6		5835.7		5814.1		85.9	85.5
2011/12	5701.1	13.7	5502.4	10.7	6575.6	12.7	6320.0	8.7	86.7	87.1
2012/13	6242.9	9.5	6361.0	15.6	7315.2	11.2	7324.1	15.9	85.3	86.8
2013/14	7383.1	18.3	7538.9	18.5	8617.4	17.8	8727.5	19.2	85.7	86.4
2014/15	9063.1	22.8	10423.8	38.3	10434.5	21.1	11598.6	32.9	86.9	89.9
2015/16	10862.7	19.9	11026.7	5.8	12978.3	24.4	12730.0	9.8	83.7	86.6
2016/17	12566.9	15.7	11889.6	7.8	15081.8	16.2	14033.2	10.2	83.3	84.7
CAGR		14.3		13.8		14.8		13.8	85.4	86.7

It is observed from table 4.11 that, in 2010-11 the value of core deposits of NIBL is Rs. 5013.8 crores and it increased to Rs. 12566.9 crores in 2016-17, with an annual growth rate of 14.3 percent. In 2010, 2011, 2012, 2013, 2014, 2015 and 2016 the core deposits of

the bank increased by 13.7 percent, 9.5 percent, 18.3 percent, 22.8 percent, 19.9 percent and 15.7 percent respectively Alongside NABIL bank has is Rs.4969.6crores and it increased to Rs.11889.6crores in 2016-17, with an annual growth rate of 13.8 percent. In 2010, 2011, 2012, 2013, 2014, 2015 and 2016 the core deposits of the Bank increased by 10.7 percent, 15.6 percent, 18.5 percent, 38.3 percent, 5.8 percent and 7.8percent respectively. The value of total assets of theNIBLbank increased during the study period 2010-11 to 2016-17 from Rs. 5835.7 crores to Rs. 15081.8 crores with an CAGR of 14.8 percent while NIBL bank increased during the study period 2010-11 to 2016-17 from Rs. 5814.1 crores to Rs. 14033.2 crores with an CAGR of 13.8 percent. In 2016-17 the deposits of the NIBL and NABIL banks increased with the annual growth of 15.7 and 7.8percent and this could be achieved due its wide reach covering all strata of society and the trust of the people.

In 2010, 2011, 2012, 2013, 2014, 2015 and 2016 the total asset of the NIBL bank increased by 12.7 percent, 11.2 percent, 17.8 percent, 21.1 percent, 24.4 percent and 16.2 percent respectively,In2010, 2011, 2012, 2013, 2014, 2015 and 2016 the core deposits of the NABIL bank increased by 8.7 percent, 15.9 percent, 19.2 percent, 32.9 percent, 9.8 percent and 10.2 percent respectively. Total assets of the banks increased due to increase in loan portfolio and investments.

It is noticed that, the core deposit to total assets ratio in 2010, 2011, 2012, 2013, 2014, 2015 and 2016 the of the NIBL Bank was85.9 percent, 86.7 percent, 85.3 percent, 85.7 percent, 86.9 percent and 83.7 percent respectively with CAGR 85.4 percent while NABIL bank has 85.5 percent, 87.1 percent, 86.8 percent, 86.4 percent, 89.9 percent and 86.6 percent respectively with CAGR 86.7 percent. A low ratio indicates higher liquidity risk because more of the asset base is being financed with volatile funds. A stable or increasing trend is desirable. During the period of study 2010-11 to 2016-17 the ratio of Core Deposit to Total assets ofbothNIBL and NABIL bank is above the indicative bench mark of 50 percent and is stable during the study period. This indicates that the liquidity position of bothbanks is good.

1.1.12 Ratio of total loans to total deposits

It indicates the ratio of loans to public deposits or core deposits. Total deposits represent saving deposits, demand deposits and term deposits. Total loans in this ratio represent the advances made by the bank to the public. Loan is treated to be less liquid asset. This ratio is calculated as follows

Total loans (Advances) /Total deposits

This ratio indicates the amount of funds lend out of the deposits mobilized by the banker. If the ratio is lower than one, the bank relied on its own deposits to make loans to its customers, without any outside borrowing. If, on the other hand, the ratio is greater than one, the bank borrowed money which it re loaned at higher rates, rather than relying entirely on its own deposits. Banks may not be earning an optimal return if the ratio is too low. If the ratio is too high, the banks might not have enough liquidity to cover any unforeseen funding requirements or economic crises.

The higher the ratio, the higher the loan-assets created from deposits. The outcome of this ratio reflects the ability of the bank to make optimal use of the available resources**.** Lower the ratio better is the liquidity position of the bank. The ideal ratio of TL/TD as per the NRB is between 65 to 75 percent.

The details of total deposits, total assets, and the ratio of total loan to total deposits of NIBL and NABIL bank for the period of study 2010-11 to 2016-17 are presented in table 4.12.

The details of total loans, total deposits and the ratio of total loans to total deposits of NIBL bank for the period of study 2010-11 to 2016-17 are presented in table 4.12. It is observed from table 5.2 that, the value of total loans of NIBL bank increased from Rs. 4188.8 crores to Rs. 10668.4 crores with CAGR 14.8 percent and total deposits from Rs. 5013.8 crores to Rs. 12566.9 crores with CAGR 14.3 percent While NABIL bank increased from Rs. 3890.5 crores to Rs. 9149.1 crores with CAGR 13.2 percent and total deposits from Rs. 4969.6 crores to Rs. 11889.6 crores with CAGR 13.8 percent during the study period 2010-11 to 2016-17.

Table 4.12

Ratio of total loans to total deposits

YEAR	TOTAL LOANS				TOTAL DEPOSITS				TL/TD (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	4188.8		3890.5		5013.8		4969.6		83.5	78.3
2011/12	4290.7	2.4	4286.8	10.2	5701.1	13.7	5502.4	10.7	75.3	77.9
2012/13	4640.0	8.1	4637.0	8.2	6242.9	9.5	6361.0	15.6	74.3	72.9
2013/14	5345.8	15.2	5469.2	17.9	7383.1	18.3	7538.9	18.5	72.4	72.5
2014/15	6769.0	26.6	6716.2	22.8	9063.1	22.8	10423.8	38.3	74.7	64.4
2015/16	8701.0	28.5	7773.0	15.7	10862.7	19.9	11026.7	5.8	80.1	70.5
2016/17	10668.4	22.6	9149.1	17.7	12566.9	15.7	11889.6	7.8	84.9	77.0
CAGR		14.8		13.2		14.3		13.8	77.9	73.4

It can also be notice from the table that the ratio of total loans to total deposits(TL/TD) of NIBL bank is above 70% during the study period 2010-11 to 2016-17.In case of NABIL bank TL/TD ratio is above 70% during study period expect 2014-15. The ratio of total loans to total depositsof both banks has ratio lower than one this indicates that the bank relied on its own deposits to make loans to its customers, without any outside borrowing. Banks may not be earning an optimal return if the ratio is too low. If the ratio is too high, the banks might not have enough liquidity to cover any unforeseen funding requirements or economic crises.

Since the ratio of total loans to total deposits of NIBL bank is above 70 percent during the study period. From liquidity risk point of view, it is not favorable as the ratio is above the ideal ratio which is in between 65% to75%.

4.1.13 Ratio of time deposit to total deposits

Time deposits provide stable level of liquidity and negligible volatility. Higher the ratio better is the liquidity position of the bank. This ratio is calculated as follows:

Time deposits /Total deposits

The details of time deposits, total deposits and the ratio of time deposits to total deposits of NIBL and NABIL bank for the period of study are presented in table 4.13.

Table 4.13

Ratio of time deposit to total deposits

YEAR	TIME DEPOSITS				TOTAL DEPOSITS				TMD/TD (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	1837.8		1684.1		5013.8		4969.6		36.7	33.9
2011/12	2005.7	9.1	1404.5	-16.6	5701.1	13.7	5502.4	10.7	35.2	25.5
2012/13	1598.5	-20.3	1078.6	-23.2	6242.9	9.5	6361.0	15.6	25.6	17.0
2013/14	1801.9	12.7	1185.5	9.9	7383.1	18.3	7538.9	18.5	24.4	15.7
2014/15	2122.9	17.8	1587.2	33.9	9063.1	22.8	10423.8	38.3	23.4	15.2
2015/16	2648.5	24.8	886.9	-44.1	10862.7	19.9	11026.7	5.8	24.4	8.0
2016/17	5369.3	102.7	2404.5	171.1	12566.9	15.7	11889.6	7.8	42.7	20.2
CAGR		21.0		18.7		14.3		13.8	30.3	19.4

It can also be observed that the time deposits of NIBL in 2010-11 are Rs. 1837.8 crores increased to Rs. 5369.3crores in 2016-17 and the CAGR is 21 percent whileNABIL in 2010-11 are Rs. 1684.1 crores increased to Rs. 2404.5 crores in 2016-17 and the CAGR is 18.7 percent.It is also noticed from the table that during the study period the ratio of time deposit to total deposits of both banks is less than 50%. The ratio is very low which shows the risk in liquidity position of the bank which is unfavorable position of banks.

4.1.14 Ratio of liquid assets to total assets

It is the ratio of liquid assets and total assets. Higher level of liquid assets in total assets will ensure better liquidity and lower liquidity risk. Liquid assets include cash in hand, balance with the NRB, balance with banks in Nepal, balance with the banks outside Nepal and money at call and short notice. Total assets mean total assets appearing in the balance sheet as on a particular date. This ratio is calculated as follows:

Cash in hand + Balance with the NRB+ Balance with banks in Nepal + Balance with the banks Outside Nepal + money at call and short notice / Total assets

Higher the ratio of liquid assets to total assets better is the liquidity position of the bank. As per the NRB, the ideal ratio is in between 15% to 20%. The liquidity assets to total assets ratio gives information about the general liquidity shock absorption capacity of a bank. As a general rule, the higher the percentage of liquid assets in total assets, the higher is the capacity to absorb liquidity shock, given that market liquidity is the same for all the banks in the sample. Nevertheless high value of this ratio may be also interpreted as inefficiency. Since liquid assets yield lower income, liquidity bears high opportunity cost for the bank. Therefore it is necessary to optimize the relation between liquidity and profitability.

The details of liquid assets, total assets and the ratio of liquid assets to total assets of NIBL and NABIL bank for the period of study 2010-11 to 2016-17 are presented in table 4.14.

Table 4.14

Ratio of liquid assets to total assets

YEAR	LIQUID ASSETS				TOTAL ASSETS				LA/TA (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	964.0		491.1		5835.7		5814.1		16.5	8.4
2011/12	1213.5	25.9	510.2	3.9	6575.6	12.7	6320.0	8.7	18.5	8.1
2012/13	1351.9	11.4	751.7	47.3	7315.2	11.2	7324.1	15.9	18.5	10.3
2013/14	1697.7	25.6	1073.1	42.8	8617.4	17.8	8727.5	19.2	19.7	12.3
2014/15	1446.4	-14.8	469.5	-56.2	10434.5	21.1	11598.6	32.9	13.9	4.0
2015/16	1317.5	-8.9	1108.2	136.0	12978.3	24.4	12730.0	9.8	10.2	8.7
2016/17	1793.8	36.1	1309.2	18.1	15081.8	16.2	14033.2	10.2	11.9	9.3
CAGR		10.8		27.4		14.8		13.8	15.6	8.7

It can be observed from the table 4.14 that the liquid assets of both NIBL and NABIL bank have a fluctuating trend during the study period 2010-11 to 2016-17. It is noticed that, the liquid assetsin 2010, 2011, 2012, 2013, 2014, 2015 and 2016 the of the NIBLbank was25.9 percent, 11.4 percent, 25.6 percent, -14.8 percent, -8.9 percent and 36.1percent respectively with CAGR 10.8 percent while NABIL bank has 3.9 percent, 47.3 percent, 42.8 percent, -56.2 percent, 136.0 percent and 18.1percent respectively with CAGR 27.4 percent.

It is also observed that the ratio of liquid assets to total assetsof NIBL and NABIL bank fluctuated during the study period. It is noticed that, the liquid assets to total assets ratio in 2010, 2011, 2012, 2013, 2014, 2015 and 2016 the of the NIBL bank was16.5 percent, 18.5 percent, 18.5 percent, 19.7 percent, 13.9 percent, 10.2 percent and 11.9 percent respectively with CAGR 15.6 percent while NABIL bank has 8.4 percent, 8.1 percent, 10.3 percent, 12.3 percent, 4.0 percent, 8.7 percent and 9.3 percent respectively with CAGR 8.7 percent. The ratio of Liquid Assets to Total assetsof NABIL bank is close to the ideal ratio. Whereas NABIL is much lower than the ideal ratio 15% to 20% in all the years of study. It indicates that the liquidity position of the NABIL bank is unfavorable.

4.1.15Ratio of prime asset to total assets

Prime assets may include cash balances with the bank and balances with banks including central bank which can be withdrawn at any time without any notice.

Cash in hand+ Balance with the NRB+ Balance with banks in Nepal+ Balance with the banks outside Nepal/ Total assets

The detail ratios of prime assets to total assets of NIBL and NABIL bank the period of study 2010-11 to 2016-17 are presented in table 4.15.

Table 4.15

Ratio of prime asset to total assets

YEAR	PRIME ASSETS				TOTAL ASSETS				PA/TA (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	814.0		245.9		5835.7		5814.1		13.9	4.2
2011/12	1193.0	46.5	427.6	73.9	6575.6	12.7	6320.0	8.7	18.1	6.8
2012/13	1325.2	11.1	588.3	37.6	7315.2	11.2	7324.1	15.9	18.1	8.0
2013/14	1674.5	26.4	999.3	69.9	8617.4	17.8	8727.5	19.2	19.4	11.5
2014/15	1431.5	-14.5	437.2	-56.3	10434.5	21.1	11598.6	32.9	13.7	3.8
2015/16	1302.6	-9.0	1026.3	134.8	12978.3	24.4	12730.0	9.8	10.0	8.1
2016/17	1789.8	37.4	1309.2	27.6	15081.8	16.2	14033.2	10.2	11.9	9.3
CAGR		14.0		41.1		14.8		13.8	15.0	7.4

It is observed from table 4.15 that the value of prime assets of NIBL increased from Rs. 814 crores in 2010-11 to Rs. 1789.8 crores in 2016-17 with CAGR 14.0 percent while NABIL bank increase from Rs. 245.9 crores to Rs. 1309.2 crores with CAGR 41.1 percent. It is also observed that the ratio of prime assets to total assetsof NIBL and NABIL bank fluctuated during the study period. It is noticed that, the prime assets to total assets ratio in 2010, 2011, 2012, 2013, 2014, 2015 and 2016 the of the NIBL Bank was percent, Rs. 814 crores, Rs. 1193.0 crores, Rs. 1325.2 crores, Rs. 1674.5 crores, Rs. 1431.5 crores, Rs. 1302.6 crores, Rs. 1789.8 croresrespectively with CAGR 14.0 percent while NABIL bank has Rs. 245.9 crores,Rs. 427.6 crores,Rs. 588.3 crores,Rs. 999.3 crores,Rs. 437.2 crores,Rs. 1026.3 crores,Rs. 1309.2 crores respectively with CAGR 41.1 percent. Alongside total assets of the bank increased due to increase in loan portfolio and investments.

It can also be observed from the table that the ratio of prime assets to total assets of during the study period of NIBL bank in 2010-11, 2007-08, 2008-09, 2009-10, 2010-11, 2011-12 and 2016-17, the ratio is 13.9%, 18.1%, 18.1%, 19.4%, 13.7%, 10% and 11.9% respectively while the ratio is 4.2%, 6.8%, 8.0%, 11.5%, 3.8%, 8.1% and 9.3% respectively for NABIL bank.The ratio recorded in case of NIBL bank is 19.4 percent in 2013-14 while in same period NABIL bank record 11.5 percent which is the highest during the study period for both bank. This indicates that the liquidity risk position of the bank is decreased in case of NIBL bank and Increased in case of NABIL bank during the study period.

4.1.16 Ratio of short-term liabilities to liquid Assets

Short-term liabilities are required to be redeemed at the earliest. Therefore, they will require ready liquid assets to meet the liability. It is expected to be lower in the interest of liquidity. A short-term liability represents demand deposits, saving deposits and bills payable. The ratio is calculated as follows

Short term liabilities/ Liquid Assets

The details of short-term liabilities, liquid assets and the ratio of short-term liabilities to liquid assets of NIBL and NABIL bank are presented in table 4.16.

Table 4.16

Ratio of short-term liabilities to liquid assets

YEAR	SHORT TERM LIABILITIES				LIQUID ASSETS				STL/LA (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	3288.6		3413.9		964.0		491.1		341.1	695.2
2011/12	3788.1	15.2	4223.0	23.7	1213.5	25.9	510.2	3.9	312.2	827.7
2012/13	4809.4	27.0	5442.4	28.9	1351.9	11.4	751.7	47.3	355.7	724.0
2013/14	5771.8	20.0	6610.5	21.5	1697.7	25.6	1073.1	42.8	340.0	616.0
2014/15	7141.3	23.7	9007.7	36.3	1446.4	-14.8	469.5	-56.2	493.7	1918.5
2015/16	8368.6	17.2	10392.5	15.4	1317.5	-8.9	1108.2	136.0	635.2	937.8
2016/17	7431.6	-11.2	9772.3	-6.0	1793.8	36.1	1309.2	18.1	414.3	746.4
CAGR		13.1		17.1		10.8		27.4	364.4	824.3

It can be observed from the table 4.16 that the value of short term liabilities of NIBL bank shows afluctuating during the study period. The short term liabilities of the NIBL bank increased from Rs.3288.6crores in 2010-11 to Rs.7431.6crores in 2016-17, with CAGR 13.1 percent while NABIL bank increased from Rs. 3419.9 crores to Rs. 9772.3 Crores with CAGR 17.1 percent.

It can be also observed that the value of liquid assets of both banks have a fluctuating trend during the study period 2010-11 to 2016-17. The liquid assets of the NIBL bank increased from Rs. 964.0 crores in 2010-11 to Rs. 1793.1 crores in 2016-17, with CAGR 10.8 percent while NABIL bank increased from Rs. 491.1 crores to Rs. 1309.2crores with CAGR 27.4 percent. The ratio of Short term liabilities to liquid assets of NIBL bank increased from 341.1 percent in 2010-11 to 414.3 percent in 2016-17 while in NABIL bank increases from 695.2 percent to 746.1 percent. This indicates that the liquidity risk position of the both bank is unfavorable during the study period because lower ratio indicates lower liquidity risk.

4.1.17 Ratio of market liabilities to total assets

Market liabilities may include money market borrowings, interbank liabilities repayable within a short period. Lower the ratio better it is. The ratio is calculated as follows

Market liabilities / Total assets

The details of market liabilities, total assets and the ratio of market liabilities to total assets of NIBL and NABIL Bank for the period of study 2010-11 to 2016-17 are presented in table 4.17.

Table 4.17

Ratio of market liabilities to total assets

YEAR	MARKET LIABILITIES				TOTAL ASSETS				MKTL/TA (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	133.1		195.1		5835.7		5814.1		2.3	3.4
2011/12	161.8	21.6	61.1	-68.7	6575.6	12.7	6320.0	8.7	2.5	1.0
2012/13	111.1	-31.3	30.0	-50.9	7315.2	11.2	7324.1	15.9	1.5	0.4
2013/14	147.4	32.8	30.0	0.0	8617.4	17.8	8727.5	19.2	1.7	0.3
2014/15	181.3	23.0	30.0	0.0	10434.5	21.1	11598.6	32.9	1.7	0.3
2015/16	180.0	-0.7	220.0	633.3	12978.3	24.4	12730.0	9.8	1.4	1.7
2016/17	179.1	-0.5	335.6	52.6	15081.8	16.2	14033.2	10.2	1.2	2.4
CAGR		6.4		80.9		14.8		13.8	1.76	1.35

It is observed from table 4.17 that the value of market liabilities of NIBL increased during the study period 2010-11 to 2016-17, from Rs.133.1crores to Rs.179.1crores with CAGR 6.4 percent while NABIL increased during the study period 2010-11 to 2016-17, from Rs. 195.1 crores to Rs. 335.6 crores with CAGR 80.9 percent. The value of total assetsof NIBL increased from Rs.5835.7crores in 2010-11 to Rs.15081.8crores in 2016-17, with CAGR 14.8 percent while NABIL increased from Rs. 5814.1 crores in 2010-11 to Rs. 14033.2 crores in 2016-17, with CAGR 13.8 percent.

The ratio of market liability to total assets of NIBL bank increased from 2.3 percent in 2010-11 to 1.2 percent in 2016-17 while in NABIL bank increases from 3.4 percent to 2.4 percent. This indicates that the liquidity risk position of the both bank is favorable during the study period because lower ratio indicates lower liquidity risk.

4.1.18 Ratio of short-term liabilities to total assets

Short-term liabilities include demand deposits, saving deposits and bills payable. A lower ratio is desirable.

The ratio is calculated as follows

Short-term liabilities / Total assets

The details of short term liabilities, total assets and the ratio of short term liabilities to total assets of NIBL and NABIL bank are presented in table 4.18.

Table 4.18

Ratio of short-term liabilities to total assets

YEAR	SHORT TERM LIABILITIES				TOTAL ASSETS				STL/TA (%)	
	NIBL		NABIL		NIBL		NABIL			
	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	Rs.	Growth %	NIBL	NABIL
2010/11	3288.6		3413.9		5835.7		5814.1		56.4	58.7
2011/12	3788.1	15.2	4223.0	23.7	6575.6	12.7	6320.0	8.7	57.6	66.8
2012/13	4809.4	27.0	5442.4	28.9	7315.2	11.2	7324.1	15.9	65.7	74.3
2013/14	5771.8	20.0	6610.5	21.5	8617.4	17.8	8727.5	19.2	67.0	75.7
2014/15	7141.3	23.7	9007.7	36.3	10434.5	21.1	11598.6	32.9	68.4	77.7
2015/16	8368.6	17.2	10392.5	15.4	12978.3	24.4	12730.0	9.8	64.5	81.6
2016/17	7431.6	-11.2	9772.3	-6.0	15081.8	16.2	14033.2	10.2	49.3	69.6
CAGR		13.1		17.1		14.8		13.8	53.2	63.7

It can be observed from table 4.18 that the value of short term liabilities of both NIBL and NIBL bank shows an increasing trend during the study period. The short term liabilities of the NIBL bank increased from Rs. 3288.6 crores in 2010-11 to Rs. 7431.6 crores in 2016-17, with CAGR 13.1 percent. The value of total assets increased from Rs. 5835.7 crores in 2010-11 to Rs. 15081.8 crores in 2016-17, with CAGR 14.8 percent. In case of NABIL bank increased from Rs. 3413.9 crores in 2010-11 to Rs. 9772.3 crores in 2016-17, with CAGR 17.1 percent. The value of total assets increased from Rs. 5814.1 crores in 2010-11 to Rs. 14033.2 crores in 2016-17, with CAGR 13.8 percent.

It is also evident from table 4.18 that the ratio of short term liabilities to total assets (STL/TA) of both banks NIBL and NABIL has a mixed trend during the study period. During the study period 2010-11 to 2016-17 the ratio is above 35%. This indicates that the liquidity risk position is favorable because a lower ratio indicates better liquidity position of the bank.

4.2 Testing the hypothesis

In this section, it is proposed to make a comparative analysis between credit risk ratios of NIBL and NABIL bank. Further, it is proposed to make a comparative analysis between liquidity risk ratios of NIBL and NABIL bank. Statistical tool t- test is applied to test the following null hypotheses according to research mythology's hypothesis.

4.2.1Comparativeanalysis between credit risk ratios of NIBL and NABIL bank

I. The ratio of non-performing assets to total loans of NIBL and NABIL bank for the period 2010-11 to 2016-17 are presented in table 4.19

Table 4.19

Non- performing assets to total loans

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	0.9	1.8			
2011/12	0.3	2.3			
2012/13	2.0	2.2			
2013/14	1.8	2.3	0.0611	2.18	0.952
2014/15	1.2	1.8			
2015/16	0.7	1.1			
2016/17	0.8	0.8			
CAGR	1.1	1.8			
Variance	0.3	0.4			

It can also be observed that the average of non-performing assets to total loans ratio of NIBL is 1.1% which is less than NABIL bank (1.8%). This indicates that the performance of NIBL is better than NABIL bank. Furthermore, the ratio of Non-performing assets to Total loansof NIBL and NABIL bank during the study period is below the International standard 2% to 3% indicating that both the banks are having low credit risk.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of non-performing assets to total loans of NIBL and NABIL bank.

H_1: There is no significant difference between the ratio of non- performing assets to total loans of NIBL and NABIL bank.

Inference: The mean and the variance of the ratio of Non- performing assets to Total loans of NABIL bank is higher than the NIBL. The mean of NIBL and NABIL Bank is 1.1and 1.8respectively. The variance of NIBL AND NABIL bank is 0.3 and 0.4 respectively. At 5 percent significance level and for 12 degrees of freedom, the p-value is 0.952; the t statistic calculated is 0.0611which is lower than the t table value, 2.178. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is no significant difference between the ratio of Non-performing assets to Total loans of NIBL and NABIL bank.

II. The ratio of risk adjusted margin (RAM) of NIBL and NABIL bank for the period 2010-11 to 2016-17 is presented in table 4.20.

Table 4.20

Risk adjusted margin

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	10.4	9.4			
2011/12	8.9	9.9			
2012/13	8.1	8.1			
2013/14	7.0	6.7	0.801	2.18	0.439
2014/15	5.9	5.1			
2015/16	5.6	5.2			
2016/17	6.5	6.3			
CAGR	7.5	7.2			
Variance	3.0	3.8			

The credit risk exposure of NIBL and NABIL bank is similar on the basis of average.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratios of risk adjusted margin of NIBL and NABIL bank.

H_2: There is no significant difference between the ratio of risk adjusted margin of NIBL and NABIL bank.

Inference: The mean of NIBL and NABIL bank is 7.5and 7.2respectively. At 5 percent significance level and 12 degrees of freedom, p-value is 0.439; the t statistic calculated is 0.801, which is lower than the t table value, 2.179. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is no

significant difference between the ratio of risk adjusted margin of NIBL and NABIL bank.

III. The ratio of total loan loss provision to total loansofNIBL and NABIL bank for the period 2010-11 to 2016-17 is presented in table 4.21.

Table 4.21

Total loan loss provisions to total loans

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	1.9	2.2			
2011/12	3.0	2.9			
2012/13	2.8	2.8			
2013/14	2.7	2.8	0.650	2.18	0.528
2014/15	2.2	2.5			
2015/16	1.8	2.1			
2016/17	1.9	1.8			
CAGR	2.3	2.4			
Variance	0.2	0.2			

The average ratio of NIBL is 2.3 percent and NABIL bank is 2.4 percent. It indicates that NABIL bank credit risk exposure is lower than NIBL.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of total loan loss provision to total loans of NIBL and NABIL Bank.

H_3: There is no significant difference between the ratio of total loan loss provision to total loans of NIBL and NABIL bank.

Inference: The mean and the variance of the ratio of total loan loss provision to total loans of NABIL bank are higher than the NIBL. The mean of NIBL and NABIL bank is 2.3 and 2.4 respectively. The variance of NIBL and NABIL bank is 0.2 and 0.2 respectively. At 5 per cent significance level and for 12 degrees of freedom, p-value is 0.528; the t statistic is 0.65which is lower than the t table value, 2.18. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is no significant difference between the ratio of total loan loss provision to total loans of NIBL and NABIL bank.

IV. The ratio of total loans to total assets of NIBL and NABIL bank for the period 2010-11 to 2016-17 are presented in table 4.22

Table 4.22

Total loans to total assets

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	71.8	66.9			
2011/12	65.3	67.8			
2012/13	63.4	63.3			
2013/14	62.0	62.7	0.152729	2.18	0.88115
2014/15	64.9	57.9			
2015/16	67.0	61.1			
2016/17	70.7	65.2			
CAGR	66.4	63.6			
Variance	13.3	11.9			

The average ratio of NIBL is 66.4 percent and NABIL bank is 63.6 percent. It indicates that NABIL bank credit risk exposure is lower than NIBL.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of total loans to total assets of NIBL and NABIL bank.

H_4: There is no significant difference between the ratio of total loans to total assets of NIBL and NABIL bank.

Inference: The mean and the variance of the ratio of total loans to total assets of NIBLare higher than the NABIL bank. The mean of NIBL and NABIL bank is 66.4 and 63.6 respectively. The variance of NIBL and NABIL bank is 13.3 and 11.9 respectively. At 5 per cent significance level and for 12 degrees of freedom, p-value is 0.8811; the t statistic is 0.1527 which is lower than the t table value, 2.18. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that statistically there is a no significant difference between the ratio of total loans to total assets of NIBL and NABIL bank.

V. The ratio of total loans to total deposits of NIBL and NABIL bank for the period 2010-11 to 2016-17is presented in table 4.23.

Table 4.23

Total loans to total deposits

YEAR	NIBL	NABIL	t-Statistic	t-Critical	P-Value
2010/11	83.5	78.3			
2011/12	75.3	77.9			
2012/13	74.3	72.9			
2013/14	72.4	72.5	0.112	2.18	0.913
2014/15	74.7	64.4			
2015/16	80.1	70.5			
2016/17	84.9	77.0			
CAGR	77.9	73.4			
Variance	24.3	24.4			

It is evident from the table that the ratio of total loans to total deposits of NIBL is above 70 percent throughout the period of study, while the ratio of NABIL bank is above 70 percent expect 2014-15 i.e. 64.4 percent during the study period. From credit risk point of view the credit risk exposure of both the banks is favorable as the ratio is in between the Ideal ratio 65 percent to 75 percent.

Application of t-test

Statistical tool t-test is applied to know the significant difference between the ratio of total loans to total deposits of NIBL and NABIL bank.

H_5: There is no significant difference between the ratio of total loans to total deposits of NIBL and NABIL bank.

INFERENCE: The mean and the variance of the ratio of total loans to total deposits of NABIL bank are higher than the NIBL. The mean of NIBL and NABILbank is 77.9 and 73.4 respectively. The variance of NIBL and NABIL bank is 24.3 and 24.4 respectively. At 5 per centsignificance level and for 12 degrees of freedom, p-value is 0.913; the t statistic is 0.122 and the t table value, 2.179. Hence, the null hypothesis is accepted. It is, therefore, concluded that statistically there is a no significant difference between the ratio of total loans to total deposits of NIBL and NABIL bank.

VI. The ratio of total equity to total assets of NIBL and NABIL bank for the period 2010-11 to 2016-17is presented in table 4.24.

Table 4.24

Total equity to total assets

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	8.8	7.9			
2011/12	9.2	8.6			
2012/13	9.6	9.1			
2013/14	9.2	8.8	0.073	2.18	0.943
2014/15	9.4	8.2			
2015/16	12.6	9.1			
2016/17	12.4	10.0			
CAGR	10.2	8.8			
Variance	2.5	0.5			

The average ratio of NIBL is 10.2 percent and NABIL bank is 8.8 percent. It indicates that NABIL bank credit risk exposure is lower than NIBL.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of Total equity to Total assets of NIBL and NABIL bank.

H_6: There is no significant difference between the ratio of total equity to total assets of NIBL and NABIL bank.

Inference: The mean and the variance of the ratio of total equity to total assets of NABIL bank are higher than the NIBL. The mean of NIBL and NABIL bank is 10.2 and 8.8 respectively. The variance of NIBL and NABIL is 2.5 and 0.5 respectively. At 5 per cent significance level and for 12 degrees of freedom the p-value is 0.943 and the t statistic calculated is 0.073, which is higher than the t table value, 2.18. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is a no significant difference between the ratio of total equity to total assets of NIBL and NABIL bank.

VII. The ratio of total loans to total equity of NIBL and NABIL bank for the period 2010-11 to 2016-17 is presented in table 4.25.

Table 4.25

Total loans to total equity

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	811.8	850.9			
2011/12	709.2	786.4			
2012/13	660.9	693.2			
2013/14	674.5	715.8	0.193	2.18	0.850
2014/15	690.2	708.0			
2015/16	534.2	670.5			
2016/17	570.3	649.1			
CAGR	664.4	724.9			
Variance	8388.9	4958.2			

It is evident from the table 4.25that the ratio of total loans to total equity of NIBL shows a significant decrease during the period under study. The ratio of NABIL bank recorded a mixed trend and ultimately decreased. The decrease in the ratio indicates the increase in the capacity of bank's capital to absorb the loan losses and it should be monitored due to the volume of the loans. The ratio of NABIL is higher than NIBL bank during all the years of study and therefore, the credit risk exposure of NABIL is more than NIBL bank.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of total loans to total equity of NIBL and NABIL bank.

H_7: There is no significant difference between the ratio of total loans to total equity of NIBL and NABIL bank.

Inference: The mean of the ratio of total loans to total equity of NABIL bank is higher than the NIBL. The mean of the ratio of NIBL and NABIL bank is 664.4 and 724.9 respectively. At 5 per cent level of significance and for 12 degrees of freedom, the p-value is 0.850; the t statistic calculated is 0.193 and t table value, 2.18. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is a no significant difference between the ratio of total loans to total equity of NIBL and NABIL bank.

VIII. The ratio of total assets to gross domestic product (GDP) of NIBL and NABIL bank for the period 2010-11 to 2016-17is presented in table 4.26.

TABLE: 4.26

Total assets togross domestic product

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	4.3	4.3			
2011/12	4.3	4.1			
2012/13	4.3	4.3			
2013/14	4.4	4.4	0.974	2.18	0.349
2014/15	4.9	5.4			
2015/16	5.8	5.6			
2016/17	5.7	5.3			
CAGR	4.8	4.8			
Variance	0.4	0.4			

It is evident from the table 4.25 that the ratio of total assets to gross domestic product of NIBL shows a mixed trend and increased during the period under study. The ratio of NABIL bank recorded a mixed trend and ultimately increased.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of total assets to gross domestic product of NIBL and NABIL bank.

H_8: There is no significant difference between the ratio of total assets to gross domestic product of NIBL and NABIL bank.

Inference: The mean of NIBL is higher than NABIL bank the variance of the ratio of total assets to gross domestic product of NABIL Bank is higher than the NIBL. The mean of the ratio of NIBL and NABIL bank is 4.8 and 4.8 respectively. The variance of the ratio of NIBL and NABIL is 0.4 and 0.4 respectively. At 5 per centsignificance level and for 12 degrees of freedom, the p-value is 0.349; the t statistic calculated is 0.974 which is lower than the t table value, 2.18**.** Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is a no significant difference between the ratio of total assets to gross domestic product of NIBL and NABIL bank.

IX. The ratio of provision for loan loss to non-performing assetsof NIBL and NABIL Bank for the period 2010-11 to 2016-17 is presented in table 4.27.

Table 4.27

Provisions for loan loss to non-performing assets

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	200.4	126.3			
2011/12	890.8	126.2			
2012/13	142.4	125.7			
2013/14	151.9	120.3	0.203	2.18	0.842
2014/15	174.3	136.0			
2015/16	261.2	182.7			
2016/17	231.8	221.7			
CAGR	293.3	148.4			
Variance	71221.4	1498.5			

It is evident from the table 4.27 that the provision for loan loss to non-performing assetsof NIBL and NABIL bank show a fluctuation and increases during the period under study.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of Provision for Loan Loss to NPA of NIBL and NABIL bank.

H_9: There is no significant difference between the ratio of the ratio of provision for loan loss to NPA of NIBL and NABIL bank.

Inference: The mean and the variance of the ratio of provision for loan loss to NPA of NABIL bank are higher than the NIBL. The mean of NIBL and NABIL bank is 22.05 and 33.21 respectively. The variance of NIBL and NABIL is 58.02 and 314.91 respectively. At 5 per cent significance level and 12 degrees of freedom, the p-value is 0.15; the t statistic calculated is 1.52 which is lower than the t table value, 2.179. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is therefore, concluded that there is no significant difference between the ratio of provision for loan loss to NPA of NIBL and NABIL bank.

X. The ratio of Non-performing assets to non-performing assets and total equity of NIBL and NABIL bank for the period 2010-11 to 2016-17are presented in table 4.28.

Table 4.28

Non-performing assets (NPA) to NPA and total equity (NPA + TE)

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	7.1	12.4			
2011/12	2.3	15.5			
2012/13	11.5	12.8			
2013/14	10.7	14.2	0.040	2.18	0.969
2014/15	7.9	11.8			
2015/16	3.5	7.2			
2016/17	4.5	5.2			
CAGR	6.8	11.3			
Variance	12.5	13.9			

Application of t-test:Statistical tool t-test is applied to know the significant difference between the ratio of non-performing assets to non-performing assets and total equity of NIBL and NABIL bank.

H_{10}: There is no significant difference between the ratio of non-performing assets to non-performing assets and total equity of NIBL and NABIL bank.

Inference: The mean of the ratio of non-performing assets to non-performing assets and equity of NABIL is higher than the NIBL bank and the variance of the ratio of NABIL Bank is higher than the NIBL The mean of the ratio of NIBL and NABIL bank is 6.8 and 11.3 respectively. The variance of NIBL and NABIL is 12.5 and 11.9 respectively. At 5 per centsignificance level and 12 degrees of freedom, the p-value is 0.969; the t statistic calculated is 0.040 which is lower than the t table value, 2.18**.** Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that statistically there is a no significant difference between the ratio of non- performing assets to non-performing assets and equity of NIBL and NABIL bank.

4.2.2 Comparative analysis between liquidity risk ratios of NIBL and NABIL bank

I. The ratio of core deposits to total assets of NIBL and NABIL bank for the period 2010-11 to 2016-17 is presented in table 4.29.

TABLE 4.29

Core deposit to total assets

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	85.9	85.5			
2011/12	86.7	87.1			
2012/13	85.3	86.8			
2013/14	85.7	86.4	0.118	2.18	0.908
2014/15	86.9	89.9			
2015/16	83.7	86.6			
2016/17	83.3	84.7			
CAGR	85.4	86.7			
Variance	1.9	2.6			

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of core deposits to total assets and equity of NIBL and NABIL bank.

H_{11}: There is no significant difference between the ratio of core deposits to total assets of NIBL and NABIL bank.

Inference: The mean of the ratio of core deposits to total assets of NIBL is higher than the NABIL bank. The variance of the ratio of core deposits to total assets of NABIL bank is higher than the NIBL. The mean of the ratio of NIBL and NABIL bank is 85.4 and 86.7 respectively. The variance of NIBL and NABIL is 1.9 and 2.6 respectively. At 5 percentsignificance level and for 12 degrees of freedom, the p-value is 0.908; the t statistic calculated is 0.118 which is lower than the t table value, 2.18**.** Hence, the null hypothesis is accepted and the alternative hypothesis isrejected. It is, therefore, concluded that there is a no significant difference between the ratio of core deposits to total assets of NIBL and NABIL bank.

II. The ratio of total loan to total deposit of NIBL and NABIL Bank for the period 2010-11 to 2016-17 is presented in table 4.30.

TABLE 4.30

Total loans to total deposits

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	83.5	78.3			
2011/12	75.3	77.9			
2012/13	74.3	72.9			
2013/14	72.4	72.5	0.112	2.18	0.913
2014/15	74.7	64.4			
2015/16	80.1	70.5			
2016/17	84.9	77.0			
CAGR	77.9	73.4			
Variance	24.3	24.4			

It is evident from the table 4.27 that the ratio loan to total deposit of NIBL and NABIL bank show a fluctuation and ultimately decreases during the period under study. The ideal ratio of this ratio is 65-75 percentages.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of total loans to total deposits of NIBL and NABIL bank.

H_{12}: There is no significant difference between the ratio of total loans to total deposits of NIBL and NABIL bank.

Inference: The mean and the variance of the ratio of total loans to total deposits of NABIL Bank are higher than the NIBL. The mean of NIBL and NABIL bank is 77.9 and 73.4 respectively. The variance of NIBL and NABIL bank is 24.3 and 24.4 respectively. At 5 percent level ofsignificance and for 12 degrees of freedom, the p-value is 0.913; the t statistic calculated is 0.112, which is lower than the t table, 2.179. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is a no significant difference between the ratio of total loans to total deposits of NIBL and NABIL bank.

III. The ratio of time deposit to total deposits of NIBL and NABIL Bank for the period 2010-11 to 2016-17 is presented in table 4.31.

Table 4.31

Time deposit to total deposits

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	36.7	33.9			
2011/12	35.2	25.5			
2012/13	25.6	17.0			
2013/14	24.4	15.7	0.025	2.178	0.980
2014/15	23.4	15.2			
2015/16	24.4	8.0			
2016/17	42.7	20.2			
CAGR	30.3	19.4			
Variance	59.6	69.0			

It is observed from the table 4.31 that, during the study period the ratio of time deposit to total deposits of NIBL and NABIL bank is less than 50 percent. The NIBL'stime deposits to total deposits ratio increased from 36.7 percent in 2010-11 to 42.7 percent in 2016-17. However, in 2014-15 the ratio of NIBLis 23.4 percent, which is the lower during the study period.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of time Deposits to total deposits of NIBL and NABIL bank.

H_{13}: There is no significant difference between the ratio of timedeposits to total deposits of NIBL and NABIL bank.

Inference: The mean and the variance of the ratio of timedeposits to total deposits of NABIL bank is higher than the NIBL The mean of the ratio of NIBL and NABIL bank is 30.3 and 19.4 respectively. The variance of NIBL and NABIL is 59.6 and 60.9 respectively. At 5 per cent significance level and 12 degrees of freedom, the p-value is 0.980; the t statistic calculated is 0.025 which is lower than the t table value, 2.18. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is a no significant difference between the ratio of timedeposits to total deposits of NIBL and NABIL bank.

IV. The ratio of liquid assets to total assets of NIBL and NABIL bank for the period 2010-11 to 2016-17is presented in table 4.32.

Table 4.32

Liquid assets to total assets

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	16.5	8.4			
2011/12	18.5	8.1			
2012/13	18.5	10.3			
2013/14	19.7	12.3	0.002	2.178	0.998
2014/15	13.9	4.0			
2015/16	10.2	8.7			
2016/17	11.9	9.3			
CAGR	15.6	8.7			
Variance	13.4	6.3			

It is observed from the table 4.32 that, during the study period the ratio of liquid assets to total asset of NIBL and NABIL bank is less than 20 percent. The ideal ratio is 15-20 percentages.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of liquid assets to total assets of NIBL and NABIL bank.

$H_{14:}$ There is no significant difference between the ratio of liquid assets to total assets of NIBL and NABIL bank.

Inference: The mean of the ratio of liquid assets to total assets of NIBL is marginally higher than the NABIL bank. The variance of this ratio of NABIL bank is higher than the NIBL. The mean of this ratio of NIBL and NABIL bank is 15.6 and 8.7respectively. The variance of this ratio of NIBL and NABIL bank is 1.72 and 1.88 respectively. At 5 percentsignificance level and 12 degrees of freedom, the p-value is 0.93; the t statistic calculated is 0.002which is lower than the t table value, 2.18**.** Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is no significant difference between the ratio of liquid assets to total assets of NIBL and NABIL bank.

V. The ratio of prime assets to total assets of NIBL and NABIL Bank for the period 2010-11 to 2016-17is presented in table 4.33.

Table 4.33

Prime assets to total assets

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	13.9	4.2			
2011/12	18.1	6.8			
2012/13	18.1	8.0			
2013/14	19.4	11.5	0.001	2.178	0.999
2014/15	13.7	3.8			
2015/16	10.0	8.1			
2016/17	11.9	9.3			
CAGR	15.0	7.4			
Variance	12.7	7.4			

The average ratio of NIBL is 15.0 percent and NABIL Bank is 7.4 percent, indicating that the liquidity risk exposure of banks is different.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of prime assets to total assets of NIBL and NABIL bank.

H_{15}: There is no significant difference between the ratio of prime assets to total assets of NIBL and NABIL bank.

Inference: The mean and the variance of the ratio of prime assets to total assets of NABIL bank are higher than the NIBL. The mean of NIBL and NABIL bank is 15.0 and 7.4 respectively. The variance of NIBL and NABIL is 12.7 and 7.4 respectively. At 5 per cent significance level and 12 degrees of freedom, the p-value is 0.999; the t statistic calculated is 0.001which is lower than the t table value, 2.18. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that statistically there is no significant difference between the ratio of prime assets to total assets of NIBL and NABIL bank.

VI. The ratio of short term liabilities to liquid assets of NIBL and NABIL Bank for the period 2010-11 to 2016-17is presented in table 4.34.

Table 4.34

Short-term liabilities to liquid assets

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	341.1	695.2			
2011/12	312.2	827.7			
2012/13	355.7	724.0			
2013/14	340.0	616.0	0.024	2.178	0.982
2014/15	493.7	1918.5			
2015/16	635.2	937.8			
2016/17	414.3	746.4			
CAGR	413.2	923.7			
Variance	13304.1	202879.1			

During the study period, the ratio of NIBL is lower than NABIL Bank hence the liquidity risk exposure of NIBL is lower than NABIL banks.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of short term liabilities to liquid assets of NIBL and NABIL bank.

H_{16}: There is no significant difference between the ratio of short term liabilities to liquid assets of NIBL and NABIL bank.

Inference: The mean of the ratio of short term liabilities to liquid assets of NIBL is higher than the NABIL bank. The variance of the ratio of short term liabilities to liquid assets of NABIL bank is higher than the NIBL. The mean of the ratio of NIBL and NABIL bank is 413.2 and 923.7 respectively. The variance of NIBL and NABIL is 13304.1 and 202879.1 respectively. At 5 per cent significance level and 12 degrees of freedom the p-value is 0.982, the t statistic calculated is 0.024 which is lower than the t table value, 2.18. Hence, the null hypothesis is accepted and the alternative hypothesis isrejected. It is, therefore, concluded that there is a no significant difference between the ratio of short term liabilities to liquid assets of NIBL and NABIL bank.

VII. The ratio of market liabilities to total assets of NIBL and NABIL bank for the period 2010-11 to 2016-17 are presented in table 4.35.

Table 4.35

Market liabilities to total assets

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	2.3	3.4			
2011/12	2.5	1.0			
2012/13	1.5	0.4			
2013/14	1.7	0.3	0.427	2.178	0.677
2014/15	1.7	0.3			
2015/16	1.4	1.7			
2016/17	1.2	2.4			
CAGR	1.8	1.4			
Variance	0.2	1.4			

The ratio of NIBL is much lower than NABILbank; hence the liquidity risk exposure of NIBL is lower than NABIL bank.

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of market liabilities to total assets of NIBL and NABIL bank.

H_{17}: There is no significant difference between the ratio of market liabilities to total assets of NIBL and NABIL bank.

Inference: The mean and the variance of the ratio of market liabilities to total assets of NIBLis higher than the NABIL bank The mean of the ratio of NIBL and NABIL bank is 1.8 and 1.4 respectively. The variance of NIBL and NABIL is 0.2 and 1.4 respectively. At 5 per cent significance level and 12 degrees of freedom, the p-value is 0.677; the t statistic calculated is 0.427 which is lower than the t table value, 2.18. Hence, the null hypothesis is accepted and the alternative hypothesis isrejected. It is, therefore, concluded that there is a no significant difference between the ratio of market liabilities to total assets of NIBL and NABIL bank.

VIII. The ratio of short term liabilities to total assets of NIBL and NABIL bank for the period 2010-11 to 2016-17is presented in table 4.36.

Table 4.36

Short-term liabilities to total assets

YEAR	NIBL	NABIL	t-Statistic	t-critical	P-Value
2010/11	56.4	58.7			
2011/12	57.6	66.8			
2012/13	65.7	74.3			
2013/14	67.0	75.7	0.018	2.178	0.986
2014/15	68.4	77.7			
2015/16	64.5	81.6			
2016/17	49.3	69.6			
CAGR	61.3	72.1			
Variance	49.3	58.8			

Application of t-test: Statistical tool t-test is applied to know the significant difference between the ratio of short term liabilities to total assets of NIBL and NABIL Bank.

H_{18}: There is no significant difference between the ratio of short term liabilities to total assets of NIBL and NABIL bank.

Inference: The mean of the ratio of short term liabilities to total assets of NIBL is lower than the NABIL bank. The variance of the ratio of short term liabilities to total assets of NABIL bank is higher than the NIBL the mean of the ratio of NIBL and NABIL bank is 61.3 and 72.1 respectively. The variance of NIBL and NABIL is 49.3 and 58.8 respectively. At 5 per cent significance level and 12 degrees of freedom the p-value is 0.986, the t statistic calculated is 0.018, which is higher than the t table value, 2.18. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. It is, therefore, concluded that there is a no significant difference between the ratio of short term liabilities to total assets of NIBL and NABIL bank.

4.3 Analysis summary

1. The ratio of non-performing assets to total loans of NIBL and NABIL bank during the study period is below the International standard 2 percent to 3 percent. Both the banks did comply with the international norm and hence it can be concluded that the banks under study, are not exposed to high credit risk.

2. The ideal ratio of total loans to total assets as per NRB is 65 percent to 70 percent. The ratio of total loans to total assets of both banks is in the ideal ratio, during the study period 2010-11 to 2016-17. Hence, it can be concluded that the both banks has ideal margin to increase its loan portfolio and thereby increase its profit.

3. The ideal ratio of total loans to total deposits is 65 percent to 75 percent. The ratio of total loans to total deposits of NIBL and NABIL bank is below 75 percent. The banks are borrowing from the repo window and call money market to fuel credit growth.

5. It is concluded that the select banks created more loan assets from its deposits and has such their credit risk and liquidity risk exposure is high. The banks should take measures in order to maintain the ideal ratio and follows the ideals norms of NRB to minimize the exposure of risk.

6. The ratio of provision for loan loss to NPA of NIBL and NABIL Bank is above the international, provision coverage ratio of 70 percent to 80 percent. Both the banks cover the provision for loan which create their standard for covering non-performing loans.

7. During the study period 2010 to 2017, the ratio of core deposits to total assets of NIBL and NABIL Bank is above the indicative benchmark 50 percent. A low ratio indicates higher liquidity risk. Hence, it is concluded that the liquidity risk position as per this ratio, for both the banks is favorable.

8. As per the t-test analysis, it can be concluded that there is no significant difference between NIBL and NABIL bank credit and liquidity risk ratios.Both the bank has its market standard to both risk factors ad applied for the NRB regulative of Risk management.

Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter contains observations, conclusion and suggestions on various issues analyzed and examined in the present study. They are presented below and the possible areas of future research are also indicated at the end.

5.1 Summary

The accelerated growth of financial institutions in second phase B and the current third phase is purely from the private and/or joint-venture sector with no participation of the GoN; this has resulted from greater reform initiatives. With these quantitative developments in the financial sector, NRB has changed its role from simply focusing on the provisioning of financial services to regulation and supervision aspects in an open and liberalized environment.

1. It is observed that during the pre-development, several banks were established and only few banks survived. The banks failed due to large exposure to speculative activities; undercapitalization and lacked the experience and maturity to compete with the presidency and exchange banks.

2. In 2002, the Government of Nepal initiated liberalization, privatization and globalization in banking sector.

3. A similar trend is observed regarding the market share of deposits of nationalized banks, public sector banks and private sector banks. The market share of deposits of nationalized banks and public sector banks showed a deceleration in deposit position. The share of private sector banks increased.

4. It is also observed that CAGR in respect of equity, reserves, deposits, advances, net profits and number of branches of private sector banks is comparatively higher than the nationalized banks and public sector banks.

5.1.1Risk management inbanking sectors in Nepal with baselaccords

It is observed that the risks faced by the banks are highly interdependent and events that affect one area of risk can have ramifications for a range of other risk categories. Thus,

top management of banks pays considerable importance to improve the ability to identify measure, monitor and control the overall level of risks undertaken. Risk Management is an attempt to identify measure, monitor and manage uncertainty. It does not aim at risk elimination, but enables the banks to bring their risks to manageable proportions while not severely affecting their income. The global trend for an appropriate risk management organization structure is towards centralizing risk management with integrated treasury management function to benefit from information on aggregate exposure, natural netting of exposures, economies of scale and easier reporting to top management. The risk management is a complex function and it requires specialized skills and expertise. At present banks seek services of Global Consultants who have vast experience in risk modeling as these players identify the gap in the system and help the banks in devising a risk return model. It is observed that the guidelines issued by NRB on risk management from time to time, are being implemented by banks through various committees.

The Bank for International Settlements (or BIS) is an international organization of central banks which exists to foster cooperation among central banks and other agencies in pursuit of monetary and financial stability". The BIS has two specific goals viz., to regulate capital adequacy and make reserve requirements. The Basel Committee on Banking Supervision (BCBS) was formed under the auspices of the Bank for International Settlements (BIS). The BIS' main role is in setting capital adequacy requirements. The BIS requires bank capital to asset ratio to be above a prescribed minimum international standard, for the protection of all central banks involved. From an international point of view, ensuring capital adequacy is the most important problem in central banks, as speculative lending based on inadequate underlying capital and widely varying liability rules causes economic crises as "bad money drives out good" (Gresham's Law). It is also observed that the BISsets requirements on two categories of capital viz., tier 1 capital and total capital. Tier 1 capital is the book value of its stock plus retained earnings. Tier 2 capitals are loan loss reserves plus subordinated debt. Total capital is the sum of Tier 1 and Tier 2 capital.

The Basel Accord(s) refers to the banking supervision accords (recommendations on banking laws and regulations), issued by the Basel Committee on Banking Supervision (BCBS). They are called the Basel Accords as the BCBS maintains its secretariat at the

Bank of International Settlements in Basel, Switzerland. It is noticed that the BCBS committee does not have the authority to enforce recommendations, although most member countries and others tend to implement the Committee's policies. The recommendations are enforced through national or EU-wide laws and regulations, thus some time may pass between recommendations and implementation as law at the national level. The Basel capital accord in 1988 proposed by Basel Committee of Bank Supervision (BCBS) of the Bank for International Settlement (BIS) focused on reducing credit risk, prescribing a minimum capital risk adjusted ratio (CRAR) of 8 percent of the risk weighted assets. The 1988 Basel Accord came to be known as Basel I.

In 1988, BCBS has introduced first International standards Basel I, to manage Banking risks with the help of standardized Capital Adequacy Ratio. CRAR ensures minimum capital so as to reduce bank failures; to promote stability, safety and soundness of the banking system; to prevent systemic disaster and to ultimately reduce losses to the bank depositors. On June 26, 2004, the Basel Committee in Banking Supervision released Basel II Accord. Basel I initially had credit risk and afterwards included market risk. In Basel II, apart from credit and market risk; operational risk was considered in capital adequacy ratio calculation.

The Basel II relies on three pillars: Pillar I-minimum capital requirements, Pillar II-supervisory review process and Pillar III- market discipline. The first pillar reduces the risk across the banking system so as to improve the measurement framework set out in the Basel I. The minimum capital requirement is expected to reduce considerably for banks and other financial institutions. The implementation of the second pillar demands increased interaction between bank managers and supervisory bodies. This would enhance the level of transparency within the organization. The third pillar of the Basel II framework helps to increase awareness of all the risks in the banking sector through a process of detailed disclosure. This helps increase transparency. It is observed that the main focus of the new framework Basel II is on providing the right incentives to the banks to adopt data-based, quantitative risk management systems to be able to adopt the advanced risk-sensitive approaches of the revised framework, which, in turn, would contribute to systemic and financial stability.

It is also observed that the banks in NEPAL are subject to the capital adequacy norms stipulated by the NRB guidelines on Basel II which became applicable from 2008. Prior to the year 2008, the banks are subject to capital adequacy norms as stipulated by the NRB guidelines on Basel I. The NRB guidelines on Basel II require the Banks to maintain a minimum CAR of 9 percent with a minimum Tier-1 capital adequacy ratio of 6 percent, which is above the CAR stipulated by the baselcommittee in banking supervision. It is also observed that, NRB has also stipulated that banks shall maintain capital at higher of the minimum capital required as per Basel II or 80 percent of the minimum capital required as per Basel I.

It is found that CAR of NIBL bank and its subsidiaries under Basel I recorded a mixed trend during the study period 2010-11 to 2016-17. This is a direct consequence of risk dependent weights assigned to different types of loans. It is also observed that the CAR of NIBL bank and its subsidiaries is higher under basel II when compared to basel I, this could be due to operational risk being included under Basel II. It can also be observed that the CAR in case of old private sector banks the CAR values are slightly higher than their counterparts in the first two groups vizNIBL and its subsidiaries and nationalized banks. It is found that the new private sector banks work with a generally higher CAR, occasionally with CAR higher than 15%, indicative of preference for a high risk margin. It may be noted that the variation in CAR is minimal in for public sector banks, followed by private sector banks. It is due to the regulation and supervision of Nepal Rastra Bank.

It may also be noted that as compared to Basel I, the CAR is higher under Basel II possibly due to operational risk being included under the latter. It is found that the capital to risk-weighted assets ratio (CRAR) of Nepalese banks is maintained well above the stipulated 10 per cent for the system as a whole as well as for all bank groups during 2010-11 to 2016-17, indicating that Nepalese banks remained well-capitalized. This is due to the policy of Nepal Rastra Bank for increase of capital or merger of bank. Basel II has rewarded banks with better asset quality and the risk weights lower due to risk sensitivity of Basel II. On an average Nepalese Banks's CRAR is better due to use of Basel II. It is also observed that the capital adequacy ratio and Tier I capital ratio of NIBL Bank and NABIL Bank is higher than that stipulated by Basel accord.

Both the banks are good and well-capitalized with respect to capital adequacy because it is above the Basel norms. It is noted that NIBL Bank and NABIL Bank has an Independent Risk Governance structure in line with the international best practices. The Banks, as per NRB guidelines, has migrated to Basel II as on 2010 with the standardized approach for credit risk and basic indicator approach for operational risk. standardizedduration method for market risk was implemented by the banks.

5.1.3 Credit risk management in NIBL and NABIL

1. It is observed that the value of non-performing assets of NIBL bank increased with CAGR 69.93 percent and the total loans of the bank also increased with CAGR 14.79 percent during the study period 2010-11 to 2016-17. It is further observed that the annual percentage increase in the value of NPA's of the bank is higher than the annual percentage increase in total loans during the study period, except in 2011-12, 2014-15, 2015-16.

2. It is found that the ratio of non-performing assets to total loans of NIBL bank significantly increased from -63.94 percent (2011-12) to 540.59 percent (2012-13). This indicates that the credit risk of NIBL bank increased during the study period. The quality of assets that a bank possesses is diminishing that year extremely with change in technology.

3. It is noted that the increase in the ratio of non-performing assets to total loans of NIBL bank is due to increase in NPA's for the year 2012-13. This considerably decreases in period of study.

4. It is also observed that the ratio of non- performing assets to total loans of NIBL bank is ideal the international standard which is between 2 to 3 percent during the study period.

5. It is found that, the value of net interest income of NIBL bank recorded an increasing trend with CAGR 7.6percent;it is also observed that the value of other income earned by the NIBL bank increased with CAGR 16.3 percent during the study period. The value of net interest income of NIBL bank increased due to higher growth in the total loan portfolios.

6. It is found that the value of total assets of the NIBL bank increased with CAGR 14.77 percent during the study period 2010-11 to 2016-17. In 2015-16, percentage increase in the value of total assets is 24.38 percent which is the highest, during the study period. It is also noted that total assets increased mainly due to increase in loan portfolio and investments in 2015-16.

7. It is found that the ratio of risk adjusted margin of bothbank is pretty stable during the study period, which is a good sign.

8. It is found that the ratio of total loan loss provisions to total loans of NIBL bank increased from 1.89 percent to 1.93 percent during the study period. The ratio of total loan loss provision to total loans of NIBL bank when combined with the ratio of non-performing assets to total loans indicates that the credit risk exposure of the bank slightly increased during the study period because higher ratio indicates higher risk which can show effect in future.

9. It is observed that the ratio of total loans to total assets of NIBL bank is in mixed trend. The trends of decreasing from ratio of total loan to total asset in 2010-11 (71.78%) to 2013-14 (62.04%) and increased 2016-17 (70.74). It indicates that the credit risk position of the bank increased. The quality of assets that a bank possesses is diminishing every year.

10. It is also observed that total loans to total assets (TL/TA) ratio of NIBL bank is and above the desired level in 2010-11, 2015-16 and 2016-17. It is only in 2011-12 to 2014-15the ratio is as desired by the NRB.

11. It is found that the ratio of total loans to total deposits of NIBL bank is above and equal to 75 percent during the study period, except in 2013. From credit risk point of view, it is not favorable as the ratio is above the ideal ratio which is between 65 to 75 percent.

12. It is also found that the ratio of total equity to total assets of NIBL bank has a consistent upward trend during the study period. Hence, the credit risk position of the bank is favorable which gives degree of protection against the risk that interest payments

will declines with earnings declined even if much of the business is financed by borrowings or non-equity shares.

13. It is observed that the ratio of total loans to total equity of NIBL bank had significant decreases during the period. The capacity of bank's capital to absorb the loan losses toughen during the study period and even if, should be monitored due to the volume of the loans. The credit risk exposure of NIBL bank decreases during the study period. It's found that the proportionate increase in total loans is lower that the proportionate increase in total equity of the NIBL bank.

14. It is found that the ratio of total assets to GDP of NIBL bank increased from 4.27 to 5.71 percent during the study period.

15. It is also observed that the ratio of provision for loan loss to NPA of NIBL bank increased from 200.4 percent in 2010-11 to 231.8 percent in 2016-17. During the study period the ratio of NIBL bank is much above 35 percent. This indicates that the bank has made adequate provision for NPA's as such the credit risk position of the bank is favorable.

16. It is observed that the value of total loans of NABIL bank increases each year, even if there is volatile interest rate environment, high asset prices and the impact of economic slowdown on consumer spending.

17. It is also observed from the analysis that the ratio of non-performing assets to total loans of NABIL bank decrease from 1.77 percent (2010-11) to 0.80 percent (2016-17). The ratio of non-performing assets to total loans is 2.33 percent in 2011-12, which is the highest during the study period; this can be attributed to increase in the value of non-performing assets by 44.97 percent on year-on-year basis. During 2010-11 to 2013-14, the ratio of non-performing assets to total loans recorded an increasing trend. However, during 2014-15 to 2016-17 the ratio recorded a decreasing trend.

18. It is found that the gradual decline in the ratio of non-performing assets to total loans of NABIL bank is due to tightening of norms in respect of NPA's. This could also be possible through the adoption of various measures such as improved risk management practices, implementation of different act and corporate debt restructuring mechanism

etc. The NPA to total loans ratio shows that asset quality of NABIL banks shows a steady improvement.

19. However, it is also observed that the ratio of non-performing assets to total loans of NABIL bank is always in the international standard during the study period.

20. It is found that the ratio of non-performing assets to total loans of NABIL bank decreased during the study period 2010 to 2017, this indicates that the NABIL bank credit risk is decreasing and the quality of assets that the Bank possess is improving.

21. It is found that, the value of net interest income of NABIL bank increased with CAGR 6.9 percent. However, it is observed that, in 2012-13 net interest income of NABIL bank decreased by 7 percent primarily due to a decrease in the average volume of interest-earning assets and increase of non-performing assets and interest rate reforms. It is also noted that the value of other income increased with CAGR 11.96 percent during the study period.

22. It is observed that the value of provision for NPA's of NABIL bank increase from Rs. 87.1 crores in 2010-11 to Rs. 161.4 crores in 2016-17 with CAGR 10.20 percent. However, in 2015-16 onward the value of provision for NPA's of the bank decreases due to decrease in losses on the unsecured loan portfolio, lower of challenges in collections.

23. It is also found that the value of total loan loss provision of the NABIL bank increase in 2010-11 to 2014-15 by 44.8 percent at highest, primarily due to a sharp increase in accretion to retail non-performing loans.

24. It is noted that the total assets of NABIL bank increased during the study period 2010-11 to 2016-17 with CAGR 13.81 percent. The total assets of the bank increased due to increase in loans and investments.

25. It is also noted that the ratio of risk adjusted margin of NABIL bank decreases from 9.41 percent in 2010-11 to 6.28 percent in 2016-17. This indicates that the credit risk position of the bank is unfavorable.

26. It is observed that the ratio of total loan loss provision to total loans of NABIL bank decreased from 2.24 percent to 1.76 percent during the study period. This ratio when

combined with the ratio of non-performing assets to total loans indicates that the credit risk position of the bank slightly increased but under international standard.

27. It can also be observed that the ratio of total loans to total assets of NABIL bank decreased from 66.92 percent in 2010-11 to 65.20 percent in 2016-17. This indicates that the banks credit risk position of NABIL bank is favorable because a high ratio of total loans to total assets would mean that the chances of non-performing assets formation are also high and that the quality of assets that a bank possesses is diminishing every year.

28. It is observed that the ratio of total loans to total assets of NABIL bank is below the ideal ratio as per NRB i.e. 60 percent to 65 percent during the study period 2014-15. Hence, the bank has more margins to increase its loan portfolio and thereby increase its profit. This is seen in preceding years.

29. It is observed that total deposits of NABIL bank increased with 13.82 percent CAGR during the study period 2010-11 to 2016-17. However, in 2014-15, the total deposits of the bank increase primarily due to the bank's conscious strategy of high interest in fixed deposit scheme.

30. It is found that the ratio of total loans to total deposit of NABIL bank is maintained during the study period. From credit risk point of view it is favorable as the ratio is above the ideal ratio which is between 65 to 75 percent. The ratio of TL to TD is well maintained near to ideal ratio.

31. It is observed that the total equity of the both bank increased. This is due to the regulation of NRB to mandatory increase the equity of commercial bank to 800 crores.

32. It is observed that the ratio of total equity to total assets of NABIL bank has increases, during the study period from 7.86 percent in 2010-11 to 10.04 percent in 2016-17. However, the ratio recorded a mixed trend during the study period. This reveals the Strengthen capacity of the bank to absorb loan losses. This indicates that the credit risk position of the bank is favorable because a high ratio provides a degree of protection against the risk that interest payments will exceed earnings, hence, a low ratio provides low degree of protection against risk and a low ratio indicates that much of the business is financed by borrowings or non-equity shares.

33. It is observed that the ratio of total loans to total equity of NABIL bank had a significant decrease during the period under study. The capacity of bank's capital to absorb the loan losses strengthen during the study period and even if should be monitored due to the volume of the loans is increasing but equity incensement will stop.

34. It is observed that the ratio of total assets to GDP of NABIL bank is 4.79 percent CAGR during the study period. The ratio increases from 4.25 percent in 2010-11 to 5.31 percent in 2016-17.

35. The ratio of provision for loan loss to non-performing assets of NABIL bank significantly increases from 126.3 percent in 2010-11 to 221.7 percent in 2016-17. During the study period, the ratio of NABIL bank is far above the international norm 70 to 80 percent. This indicates that NABIL bank has made adequate provision for NPA's as such the credit risk position of the bank is favorable.

42. It is observed that the ratio of non-performing assets to non-performing assets&total equity of NABIL bank has decrease from 12.38 percent in 2010-11 to 5.17 percent in2016-17.As such the credit risk position of the bank is favorable.

5.1.4 Liquidity risk management in NIBL and NABIL

1. It is observed that during the study period 2010-11 to 2016-17, the ratio of core deposits to total assets of NIBL bank is above the indicative benchmark 50 percent. This indicates that the liquidity risk position of the bank is favorable.

2. It is also noted that total assets of the NIBL bank increased due to increase in loan portfolio and investments.

3. It is observed that the ratio of total loans to total deposits of NIBL bank during the study period is above 75 percent except in 2011-12 to 2013-14 and is above the ideal ratio which is 65 percent to 75 percent. This indicates that the liquidity position of NIBL bank is unfavorable.

4. It is found that during the study period the ratio of time deposit to total deposits of NIBL Bank is below 50 percent. The bank's time deposits to total deposits ratio decreases from 36.7 percent in 2010-11 to 24.4 percent in 2015-16. However, in 2016-17 the ratio is 42.7 percent, which is the highest during the study period and this implies that

the liquidity risk exposure of the bank decreased, because higher the ratio lower is the risk.

5. It is observed that the ratio of liquid assets to total assetsof NIBL Bank recorded a mixed trend during the study period. The ratio of liquid assets to rotal assetsof NIBL bank increased due to increase in both total assets and liquid assets of the bank. The decrease in the ratio is only due to decrease in liquid asset. It is also noted that the ratio of the bank decreased from 16.5 percent in 2010-11 to 11.9 percent in 2016-17.

6. It is observed that the ratio of liquid assets to total assetsof NIBL bank is much below the ideal ratio which is between 18 to 20 percent in 2010-11 (16.5%), 2014-15 (13.9%), 2015-16 (10.2%), 2016-17 (11.9%) in the years of study. The liquidity position of the bank is unfavorable.

7. It is found that the value of prime assets of NIBL Bank increased during the study period with CAGR 14.0 percent.

8. It is observed that the value of short term liabilities of NIBL Bank shows an increasing trend with CAGR 13.1 percent during the study period. However decrease in 2016-17 by 11.2 percent.

9. It is also observed that the ratio of short term liabilities to liquid assets of NIBL bank increased during the study period. Thus, indicates that the liquidity risk position of the bank is unfavorable during the study period because lower ratio indicates lower liquidity risk.

10. It is also observed that the value of market liabilities of NIBL bank increased with mixed trends during the study period with CAGR 6.4 percent.

11. It is noted that the ratio of market liabilities to total assets of NIBL and NABIL bank had a significant decrease during the study period. It decreased from 2.3 percent in 2010-11 to 1.2 percent in 2016-17 for NIBL bank. This indicates that the bank liquidity risk exposure decreased because lower the ratio, lower is the risk.

12. It is noted that the ratio of short term liabilities to total assets of NIBL and NABIL bank had a mixed trend during the study period. During the study period the ratio is above 35 percent. The ratio of short term liabilities to total assets of NIBL bank

decreased from 56.4 percent in 2010-11 to 49.3 percent in 2016-17. The liquidity risk position of NIBLbank is favorable because a lower ratio indicates better liquidity position of the bank.

13. It is observed that during the study period, the ratio of core deposits to total assets of NABIL Bank is above the indicative bench mark 50 percent. This indicates that the liquidity risk position of the bank is favorable.

14. It is noticed that the total deposits of NABIL bank increased in 2014 due to the bank's focus on increasing funding (i.e. deposits, borrowings and subordinated debts) through low-cost deposits and retail deposits.

15. It is noticed that the ratio of total loans to total deposits of NABIL bank during the study period 2010-11 to 2016-17 is above 70 percent and is in the Ideal ratio which is between 65 to 75 percent. This indicates that the liquidity position of the NABIL bank is favorable.

16. It is observed that the value of time deposits of NABIL bank increased during the study period with CAGR 18.7 percent, due to the bank's conscious strategy of paying off wholesale deposits.

17. It is noticed that the liquid assets of NABIL bank recorded a fluctuating trend, during the study period.

18. It is observed that during the period of study, the ratio of liquid assets to total assetsof NABIL bank increased. It is observed that the ratio of liquid assets to total assetsof NABIL bank is much below the ideal ratio 18 percent to 20 percent in all the years of study. The liquidity risk exposure of the bank increased during the study period.

19. It is noted that the value of prime assetsof NABIL bank increased during the study period with CAGR 41.1 percent.

20. It is also noted that theratio of prime assets to total assets of NABIL bank decreased from 4.2 percent in 2010 to 9.3 percent in 2017 during the study period. Thus, indicates that the liquidity risk position of the bank increased because higher the ratio better is the liquidity position of the bank.

21. It is observed that the value of short term liability of NABIL bank increased from Rs.3413.9 crores in 2010 to Rs.9772.3 crores, with CAGR 17.1 percent.

22. It is also observed that the ratio of short term liabilities to liquid assets of NABIL bank, during the study period recorded an increasing trend. The ratio increased mainly due to increase in short term liabilities. In 2017 the ratio declined due to decline in Short term liabilities of NABIL bank. The ratio increased from 695.2 percent in 2010-11 to 746.4 percent in 2016-17, indicating that the liquidity risk exposure of the bank increased because lower the ratio lower is the liquidity risk.

23. It is noted that the market liabilities of NABIL bank increased during the study period with CAGR 80.9 percent.

24. It is also noted that the ratio of market liabilities to total assets of NABIL bank recorded amixed trend all the years of study. The ratio of NABIL bank is below 30% during the study period. However, the ratio decreased from 3.4 percent in 2010-11 to 2.4 percent in 2016-17. The liquidity risk exposure of NABIL bank decreased.

25. It is noted that the ratio of short term liabilities to total assets of NABIL bank during the study period increased from 58.78 percent in 2010 to 69.6 percent in 2017.

5.1.5 Comparative study of risk management of NIBL and NABIL bank

1. It is found that the ratio of non-performing assets to total loansof NIBL bank and NABIL bank during the study period is below the international standard 2 percent to 3 percent indicates that both the banks are not exposed to high credit risk.

2. It is observed that, at 5 per cent significance level and for 12 degrees of freedom, the p-value is 0.952, there is no significant difference between the ratio of non- performing assets to Total loans of NIBL bank and NABIL bank.

3. It is observed that at 5 percent significance level and 12 degrees of freedom, p-value is 0.439; the t statistic calculated is 0.801, which is lower than the t table value, 2.179. It is therefore, noted that there is no significant difference between the ratio of risk adjusted margin of NIBL bank and NABIL bank and the credit exposure of both the banks decreased during the study period with no exposure of credit risk.

4. It is found that the ratio of total loan loss provisions to total loans of NIBL bank and NABIL bank when combined with the ratio of non-performing assets to total loans indicates that the credit risk position of the bank decreased during the study period. Even if CAGR of both bank are high so can show effect of credit risk in future.

5. It is noted that at 5 percent significance level and for 12 degrees of freedom, p-value is 0.528; the t statistic is 0.650which is lower than the t-critical value, 2.18. It is also noted that there is no significant difference between the ratio of Total loan loss provision to Total loans of NIBL bank and NABIL bank.

6. It is noted that the ratio of total loans to total assets of NABIL bank is below the ideal ratio as per NRB i.e. 60 percent to 70 percent during the study period 2010-11to 2016-17. Hence, the bank has more margins to increase its loan portfolio and thereby increase its profit.

7. On the other hand it is observed that the ratio of total loans to total assets of NIBL bank decreased from 71.8 percent to 66.4 percent during the study period. The quality of assets that a bank possesses is increasing every year and the bank is less dependent on debts for their business needs. However, the average ratio of NIBL bank is at the desired level while that of NABIL bank also have ratio in the desired level.

8. It is also noticed from the t-test analysis that there is a significant difference between the ratio of total loans to total assets of NIBL bank and NABIL bank at 5 per cent significance level and for 12 degrees of freedom with p-value 0.88. The null hypothesis is accepted.

9. It is observed that the t-test analysis showed that there is a no significant difference between the ratio of total loans to total deposits of NIBL bank and NABIL bank (p value = 0.00).

11. It is observed that the ratio of total equity to total assetsof NABIL bank is higher than NIBL bank during all the years of study. The mean ratio of total equity to total assets of NIBL bank and NABIL bank is 0.06 percent and 0.29 percent respectively. Hence NABIL bank credit risk exposure is lower than NIBL bank.

12. It is also observed from the t-test results that statistically there is a significant difference between the ratio of total equity to total assets of NIBL bank and NABIL bank (p-value = 0.00).

13. It is observed that the ratio of total loans to total equity of NIBL bank is higher than NABIL bank during all the years of study and the credit risk exposure of NIBL bank is more than NABIL bank.

14. It is observed that at 5 percent level of significance and for 12 degrees of freedom, the p-value is 0.00, the t statistic calculated is 6.59 and t table value is 2.18, hence the null hypothesis is rejected and the alternative hypothesis is accepted. It is observed that there is a significant difference between the ratio of total loans to total equity of NIBL bank and NABIL bank.

15. It is found that the ratio of provision for loan loss to NPA of NIBL bank and NABIL bank is far below the international provision coverage ratio of 70 percent to 80 percent.

16. It is also observed in the analysis that at 5 percent significance level and 12 degrees of freedom, the p-value is 0.15, the t statistic calculated is 1.52 which is lower than the t table value, 2.179. Therefore, there is no significant difference between the ratio of Provision for Loan Loss to NPA of NIBL bank and NABIL bank.

17. It is noticed that the ratio of non-performing assets to non-performing assets and total equity NIBL bank is higher than the ratio of NABIL bank, during the period of study. Hence, the credit risk exposure of NIBL bank is higher than NABIL banks because lower the ratio, lower the credit risk exposure.

18. It is also observed from the t-test results that at 5 percent significance level and 12 df, there is a significant difference between the ratio of non- performing assets to Non-performing assets and Total equity of NIBL bank and NABIL bank (p = 0.00).

19. It is found from the present study that the ratio of core deposits to total assets of NIBL bank is above 74 percent during the study period and that of NABIL bank is above 53 percent during the study period.

20. It is observed that during the study period 2010-11 to 2016-17, the ratio of core deposits to total assets of NIBL bank and NABIL bank is above the bench mark 50

percent. The liquidity risk exposure of both the banks under study is high. However the liquidity risk exposure of NIBL bank is lower when compared to NABIL bank because a low ratio indicates higher liquidity risk.

22.It is observed that at 5 percent level ofsignificance and for 12 degrees of freedom, the p-value is 0.00, hence the null hypothesis is accepted and the alternative hypothesis is rejected. It is observed that there is no significant difference between the ratio of core deposits to total assets of NIBL bank and NABIL bank.

23. It is noticed that the ratio of total loansto total deposits of NIBL bank and NABIL bank is lower than 1, indicating that the select banks relied on their own deposits to make loans to their customers, without any outside borrowing.

24. It is also observed that the CAGR ratio of total loans to total deposits of NIBL bank is above 77 percent during the study period and the CAGR of NABIL bank is above 73 percent during the study period. This indicates that the banks are borrowing from the repo window and call money market to fuel credit growth. From liquidity risk point of view, it is not favorable as the ratio of both the banks is above the ideal ratio 65 to 75 percent. The liquidity risk exposure of NABIL bank is lower than NIBL bank.

25. From the t-test analysis, it is found that at 5 percent level of significance and for 12 degrees of freedom, the p-value is 0.913 and the t statistic calculated is 0.112. The null hypothesis is accepted. Hence, there is a no significant difference between the ratio of total loans to total deposits of NIBL bank and NABIL bank.

26. It is found that during the study period the ratio of time deposits to total deposits of NABIL bank is lower than the ratio of NIBL bank and also the average of NABIL bank is lower than the average ratio of NIBL bank. This indicates that the liquidity risk exposure of NIBL bank is lower than the NABIL bank.

27. It is also found that at 5 percent significance level and 12 degrees of freedom, the p-value is 0.980; hence statistically there is a no significant difference between the ratio of time deposits to total deposits of NIBL bank and NABIL bank.

28. It is observed that the ratio of liquid assets to total assetsof NIBL bank and NABIL bank fluctuated during the study period. The ratio of both the select banks increased

during the study period. The ratio of both the banks moved in opposite trend during the study period.

29. In the present study it is found that the ratio of liquid assets to total assetsof NIBL bank and NABIL bank is below the ideal ratio 18 to 20 percent in all the years of study. It indicates that the liquidity position of NIBL bank and NABIL bank is unfavorable. The average ratio of liquid assets to total assets of NIBL bank is 8.7 percent and NABIL bank is 15.0 percent. This indicates that both the banks liquidity risk exposure is same.

30. The t-test results showed that statistically there is no significant difference between the ratio of liquid assets to total assets of NIBL bank and NABIL bank at 5 per cent significance level and 12 degrees of freedom (p-value = 0.998).

31. In the present study, it is observed that during the study period the ratio of prime assets to total assets of NIBL bank is stable.

32. The t-test analysis showed that at 5 per cent significance level and 12 degrees of freedom, the p-value is 0.999; the t statistic calculated is 0.001which is lower than the t table value, 2.18. Hence, there is no significant difference between the ratio of prime assets to total assets of NIBL bank and NABIL bank.

33. It is observed that the ratio of short term liabilities to liquid assets of NIBL bank and NABIL bank increased during the study period. This indicates that the liquidity risk position of both the banks increased during the study period because lower ratio indicates lower liquidity risk. During the study period, the ratio of NABIL bank is higher than NIBL bank hence the liquidity risk exposure of NABIL bank is higher than NIBL banks.

34. It is also observed that at 5 percent significance level and 12 degrees of freedom the p-value is 0.982, the t statistic calculated is 0.024. Hence, there is a no significant difference between the ratio of short term liabilities to liquid assets of NIBL and NABIL bank.

35. From the t-test analysis, it is found that at 5 percent level of significance and for 12 degrees of freedom, the p-value is 0.677 and the t statistic calculated is 0.427. The null hypothesis is accepted. Hence, statistically there is a no significant difference between the ratio of market liabilities to total assets of NIBL Bank and NABIL bank.

36. From t-test analysis is also found that at 5 percent significance level and 12 degrees of freedom the p-value is 0.982, the t- statistic calculated is 0.024 and the t table value is 2.18. Hence, there is no significant difference between the ratio of short term liabilities to total assets of NIBL Bank and NABIL bank.

5.2 Recommendations

In the light of conclusions drawn in various chapters, for better risk management in NIBL bank and NABIL bank the following suggestions are made to manage and monitor credit risk management and liquidity risk management.

1. In order to attain capital adequacy norms, the banks are increasing the tier I capital mainly by increasing the reserves and surplus. Creating tier I capital by huge plugging back of profit will discourage the investors. It is suggested that along with the creation of reserves and surplus, banks should make fresh equity issue to increase the own fund.

2. It is suggested that the select banks should have independent and effective audit to ensure the proper handling of credit risk and liquidity risk.

3. It is essential for the banks to keep a constant watch over the non-performing assets not just to keep it performing, but also once they become non-performing, effective measures are initiated to get full recovery and where this is not possible, the various means are to be initiated to get rid of the NPA's from the branch books.

4. Once the assets are classified as NPA, the select banks branch manager has to take all the necessary steps to get the dues recovered in order to maintain the good health of advances and higher profitability at the branch. This requires management of NPAs in a planned and scientific manner.

5. The select banks have to exercise extraordinary care in the selection of fresh borrowers so that new account should not enter in to the arena of non-performing assets.

6. The doubtful and loss assets should be reviewed by the banks periodically to explore possibilities for a quick write off in cases where they are fully provided for.

7. The select banks should introduce incentive schemes for employees and interest discounts for prompt repayments.

8. It is suggested that the bankers should have frequent interactions and meetings with the borrowers for creating better understanding and mutual trust so that the borrowers keep their bankers informed of any problem faced by them for initiating timely corrective action.

9. The bank-borrower relationship should be improved, so that the debt recovery will be much easier in a friendly atmosphere.

10. Insurance is the best way to reduce the NPA. The banks should take steps to insure the borrower and the assets of the borrower.

11. Lack of understanding among employees regarding the Basel accords affects banks negatively as these are the basis for any banking action. Hence, there is a need for banks to train their employees to have sufficient understanding of Basel accords in order to guide the banking growth rate in the positive direction.

12. Another major obstacle in the way of efficient functioning of banks has been the sluggish legal system of our country. Debt Recovery Tribunals should be converted in to special courts with the power of the high courts, the appeal against which can only be heard by the Supreme Court.

13. Due to lower credit risk and consequent higher profitability, greater encouragement should be given to small borrowers by both NIBL and NABIL banks.

14. If Total loans to Total assets (TL/TA) is more than 60-70%, the bank is considered to be highly illiquid. NIBL AND NABIL banks TL/TA is between the ideal ratios. The banks should continue their present strategy with respect to TL/TA ratio.

15. Liquidity risk management needs to be addressed at the highest level of bank management, the board of directors. It is important that the board understands every aspect of liquidity risk management.

16. Banks should develop well-established strategies, policies, and procedures for managing both the sources and uses of an institution‘s funds. This includes assessing and planning for short-term, medium-term, and long-term liquidity needs.

17. Adequate internal controls and internal audit reviews have to be implemented to ensure compliance with internal liquidity management policies and procedures.

18. The ratio of liquid assets to total assets of NIBL bank and NABIL bank is below the ideal ratio during the study period. The ideal ratio of liquid assets to total assets is 18% to 20%. NIBL bank and NABIL bank should improve their ratio of liquid assets to total assets. In the study period NABIL bank must watch their ratio of liquid asset to total assets.

19. The liquidity strategy and policies should be communicated to all the employees in the bank.

20. From the study it is found that the bank focused on net interest margin (NIM) and not on risk adjusted margin (RAM). It is suggested that the banks should also focus on RAM to curtail and measure credit risk.

21. It is suggested that the select banks in the present study should set bench marks for the credit risk ratios, in order to maintain credit risk at acceptable levels.

22. It is suggested that the select banks in the present study should set benchmarks for the liquidity risk ratios, in order to maintain liquidity risk at acceptable levels.

23. The NRB may set bench marks to credit risk ratios in order to manage credit risk at acceptable levels by all the banks in Nepalese banking sector.

24. The NRB may set bench marks to liquidity risk ratios in order to manage liquidity risk at acceptable levels by all the banks in Nepalese banking sector.

25. NIBL bank and NABIL bank have to control and monitor these four credit risk ratios viz., non-performing assets to total loans, risk adjusted margin, total loans to total assets and total loans to total equity in order to maintain the CAR (Basel I) at prescribed levels as per NRB.

26. The credit risk ratios can be used as a proxy for measuring the magnitude of credit risk in NIBL Bank and NABIL bank and also to control, monitor and maintain CAR at levels prescribed by the NRB.

27. The liquidity risk ratios can be used as a proxy for measuring the magnitude of liquidity risk in NIBL bank and NABIL bank and also to control, monitor and maintain CAR at levels prescribed by the NRB.

28. It is suggested that NIBL bank and NABIL bank should control and monitor the ratio core deposits to total assets to maintain the capital adequacy ratio at prescribed levels as per NRB.

29. The NRB introduced the concept of D-SIBs (Domestic Systemically Important Banks). The perceived expectation of government support amplifies risk-taking, reduces market discipline, creates competitive distortions and increases the probability of distress in the future. In light of this, it is suggested that the banks should not indulge in such activities which may cause disruption to the essential services they provide to the banking system.

5.3 Scope of future research

From the present study, the following areas have been identified for future research work in Risk Management in Banking Sector:

1. Impact of Basel III in NEPAL.

2. Operational risk management at NIBL and NABIL bank.

3. Awareness and perception of Basel II and Basel III norms across Nepalese banks.

4. Comparative study of credit risk ratios between public and private sector commercial banks in NEPAL.

5. Comparative study of liquidity risk ratios between public and private sector commercial banks in NEPAL.

6. A study on domestic systemically important banks (D-SIBs) framework.

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