IMPACT OF NON-PERFORMING ASSETS (NPAs) ON PROFITABILITY OF COMMERCIAL BANKS IN NEPAL

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

by

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Has been prepared as approved by this department in the prescribed format of faculty of management. This dissertation is forwarded for evaluation.

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Certification of Authorship

I hereby confirm that I have researched and submitted the final draft of dissertation entitled "**Impact of Non-performing Assets in Profitability of Commercial Banks in Nepal**" I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree as full acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the reference section of the thesis.

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Report of Research Committee

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Approval Sheet

We the undersigned have examined the thesis entitled "**Impact of Non-performing Assets in Profitability of Commercial Banks in Nepal**" prepared by PrapannaKarki a candidate for the degree of Master of Business Studies and conducted the viva voce examination of the candidate. We hereby certify that the thesis is worthy of acceptance.

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Abstract

Since the banking industry plays a vital role in the Nepalese economy, improving the quality of assetsin bank is most for the upliftment of banking sector and the national economy as a whole. In the recient period, the quality of asset in banks, primarily the commercial banks is constantly declining and hence resulting insufferable stress to the banking sector, regulators, and Nepaleseeconomy. The objective of the present study is to analyze theNon-performing Assets (NPA) and how it influencesthe profitability of the banks. For this purpose, the study considered NPA of 10 commercial banksfrom 2011 to 2020 and used econometric method regression model for the analysis of collected balanced pannel data. The study identified that there is fluctuation in NPA ofcommercial banks during the period. The study used ROA and ROE as dependent variables where as NPA as independent variables along with it's controlling variables i.e. LQDT, CAR and IRS and found that there is a significant positive relationship between NPA of commercial banksand return on assets (ROA). The study also found a significant negative relationship between NPA with Returnon equity (ROE) of commercial banks. Thus, this study concludes that profitability of Nepalese commercial banks is influenced by nonperforming assets and other controlling variables like: liquidity ratio, capital adequacy ratio and interest rate spread. So the study recommends to the regulators and respectivebank officials to take the necessary steps to reduce the NPA and improve the recovery mechanism.

Keywords: Non-Performing Assets, Return on Assets, Return on Equity, Capital and Econometric regression model.

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Abbreviations

BAFIA	Banking and Financial Institution Act
BFI	Bank and Financial Institutions
BOK	Bank of Kathmandu Lumbini Ltd.
CAR	Capital Adequacy Ratio
CDR	Cash to Deposit Ratio
CV	Co-efficient of Variation
EBL	Everest Bank Ltd.
FY	Fiscal year
GDP	Gross Domestic Product
HBL	Himalayan Bank Ltd.
IRS	Interest Rate Spread
LQDT	Liquidity Ratio
MBL	Machhapuchchhre Bank Ltd.
MPT	Modern Portfolio Theory
NABIL	Nabil Bank Ltd.
NCC	Nepal Credit and Commerce Bank Ltd.
NIBL	Nepal Investment Bank Ltd.
NIC	NIC Asia Bank Ltd.
NIM	Net Interest Margin
NPA	Non-Performing Assets
NPL	Non-Performing Loan
NRB	Nepal Rastra Bank Ltd
NSBI	Nepal SBI Bank Ltd
OLS	ordinary least square
ROA	Return on Assets
ROE	Return on Equity
SBL	Siddhartha Bank Ltd.

CHAPTER - I
INTRODUCTION

1.1 General background

Nepal being a developing nation depends intensely on the banking industry for the sound operation of financial activities. Banks thus help the economic uplift of a country by facilitating effective and efficient lending. Commercial banks play a vital role in the development of a country where by acting as financial intermediates so that the income generated from the surplus sector of the economy could be propagated to another deficit sector in the form of lending. However, commercial banks are facing the problem of lending in the form of NPA as an indicator of ineffective lending practice. The problem is increasing day by day and further, the study also shows that the non-performing loan ratio has a significant negative impact on the profitability of commercial banks in Nepal (Poudel, 2018).

The research conducted has justified that the profitability of commercial bank has influential relationship with profitability and states thatNPAs have insignificant inverse relationship with profit and possess a significant negative impact on ROA, ROE (Gizawet al., 2015). Nepal Rastra Bank (2017) states bank and financial institutions has obtained a license to receive deposits and make loans. Therefore, commercial banks are the heart of the financial system that holds the deposits of individuals, government and business units. They make funds available through their lending and investing activities to borrowers: individuals, business firms, and government establishments. During this process, they are exposed to several risks such as market risk, interest rate risk, liquidity risk and borrower's risk that affects the profitability of bank itself. Funso et al. (2012) also states that one of the critical risks invigilated by the Bank is the borrower's risk which is the risk of nonpayment of the disbursed loans and advances influencing the profitability of commercial banks. The commercial bank provides loans to the needy sector and extends its credit for the development of the economy and the infrastructures as a whole. The extent to which a bank extends credit to the public for productive activities accelerates the pace of the nation's economic growth and its long-term sustainability (Funso et al., 2012).

Ahmed and Tripati (2017) state that non-performing is the percentage of loan values that are not serviced for three months and above. Non- performing loan reflects the performance standard of the banks. A high level of NPL reflects the high probability of loss and net worth getting affected due to a large number of credit defaults and a similarly low level of NPL reflects the high probability of profit due to low credit default (Ahmed &Tripati, 2017). The NPL growth involves the necessity of provisions because it decreases the overall profits and number of shareholders. If there is a high proportion of bank credit there will be a higher probability that the banks can suffer from the financial crisis and vice versa (Khanna, 2012).

Non-performing loans which are due for more than three months create a great risk to the banks, the financial sector, and the economy at large. Equally, the failure of NPA's management for a long period gradually affects the profitability of commercial banks (Funso et al., 2012). Further, NPAs have become major obstacles for the banking industry since the major indicator of the profitability of commercial banks is NPA which has developed a significant negative relationship with ROA and ROE (Funso et al., 2012). Increasing non-performing assets is one of the emerging problems of Nepalese commercial banks. Gnawali (2018) states that for the study of the impact of NPA, the determining variables of non-performing loans or assets of the commercial banks must be acknowledged which include loans and advance, total deposit, shareholder's equity and total assets ratio.since the study reveals that capital adequacy ratio (CAR) and liquidity ratio (LQTD) of the bank has a positive relationship with firms' profitability i.e., ROA. Similarly, non-performing loans to total loans harm firm profitability i.e., ROE (Gnawali, 2018).

A different study has been conducted to find out the relationship between NPA and the profitability of the banking sector taking into consideration of other determining variables that may control the influence of NPA on the profitability of commercial banks. The study has revealed that NPA is negative and statistically significant toward profitability indicating a higher level of NPA loans results in a lower ROA (Kingu et al., 2018). The study has also revealed that the liquidity ratio has a negative relationship with the profits of commercial banks as the loan to deposit ratio increases, the profit level of the bank decreases. Similarly, the capital adequacy ratio has a positive relationship and is statistically significant because the higher the CAR ratio higher will be the capacity to use

own capital to fund asset growth which reduces the degree of dependency on expensive external funding capital increasing the overall profitability (Kingu et al., 2018).

NPAs are a recurring feature in the banking sector that causes financial crises. The research has also stated that poor asset quality translates into lower interest income and higher loan loss provisions, eventually leading to deterioration in banks' profitability and regulatory capital. Over time, the failure of a bank is because of the increasing level of NPAs, eventually hampering the stability of the financial condition. The past review also shows that heavy residual of non-performing loans fails in the banking sector and even to insolvency (Noman et al., 2015). Similarly, failure to control the levels of non-performing loans may guide to bank eventually to fail. Nachimuthu and Veni (2019) argue that non-performing loans have a giant impact on the profitability of banks since they reduce interest income, and also hamper current profits and capital base through provisions. Out of the total portfolio of over 60 banks, 75 percent is covered by non-performing loans that collapsed during the 1997 financial crisis in Indonesia (Hersugondo et al., 2021).

Non-performing loans are considered a determinant of profitability because high levels of nonperforming loans adversely affect bank net profit through provisioning for doubtful debts and write-offs of bad debts which normally affect profitability and capital levels (Pokharel, 2020). Subsequently, the moment non-performing loans exceed bank capital in a relatively large number of banks can compound into a bank crisis, which eventually turns into a financial crisis. The theoretical perspectives and the development of the hypotheses used to analyze the relationship between NPL and Profitability are the information asymmetry theory and the bad management hypothesis (Pokharel, 2020).

The above discussion shows that the non-performing assets harm the profitability of commercial banks. They are adversely affecting the economy of nations and the world as a whole which leads to the crisis. Though there are these findings in the context of different countries, no such findings using more recent data exist in the context of Nepal, and not exactly the determining variables of NPA are found that determine the profitability of commercial banks. Hence, considering the importance of managing and controlling non-performing loans, this study is aimed at exploring the impact of non-performing assets on the profitability of commercial banks in Nepal.

1.2 Problem statement

Commercial banks are facing challenges in reducing non-performing loan that is impacting their profitability. The total volume of non-performing loans of the commercial banks increased by 41.85 percent in the fiscal year 2019/20 and reached Rs. 52.57 billion which is 1.81 percent of the total outstanding loan and advances as of the review period (Nepal Rastra Bank, 2019/20). So, there are great difficulties in the management of non-performing loans, real estate properties, and other fixed assets (NPAs). Increment in NPA can cause a decrease in the gross income of BFIs because they have to allocate more amounts for loan loss provision. As a result, they are unable to allocate new loans to industrial or commercial enterprises as both the NPLs and NPAs have put a strain on their resources (Nepal Rastra Bank, 2021). The unavailability of new loans, therefore, hinders economic growth and development. Non-performing loans have a direct negative impact on the profitability of commercial banks by diluting returns on assets (ROA) and return on equity (ROE), both being a measurement of profitability or performance (Manu &Maheshwari, 2018). Another research states that the increase in loan to deposit ratio has a positive effect on the profitability of banks i.e., ROA and hence the increase in LQDT increases the ROA of banks as the bank can fund the loan and does not need any external expensive source of funding (Fidanoski et al., 2018).

The study has found that net NPA harms the profitability of the bank. The regression results found that net NPA harms the profitability of IFCI and no impact of NPA on the profitability of IDBI (Manu &Maheshwari, 2018). Thus, the researchers concluded that decreases in net NPA resulted in an increase in ROA, ROCE, and ROE of IFCI banks during the study period (Manu &Maheshwari, 2018). The study has also found that there is a significant negative relationship between NPA and ROE, both with and without control variables like bank size and age (Hersugondo et al., 2021). Similarly, Ahmed and Tripati (2017) state that the results of statistical analysis indicate NPAs have an insignificant inverse relationship with profit, a significant negative impact on ROA, ROE, and a significant positive impact on the Cost to Income ratio and Provision. As such, NPAs put a detrimental impact on the bank's performance. So, a unit increase in NPLs would lead to a 0.51 unit increase in provisions of the bank (Ahmed &Tripati, 2017).

Nachimuthu and Veni (2019) state that non-performing assets negatively harm on the profitability of commercial banks in India. The various analyses were used to find out the impact of NPAs on the profitability of the scheduled commercial banks. It was significantly related to the Ratio of Gross NPA to Gross Advances Ratio of Net NPA to Net Advances, Ratio of Gross NPA to Total Assets and Ratio of Net NPA to Total Assets are insignificantly related to each other (Nachimuthu&Veni, 2019). Wadhwa and Ramaswamy(2020) state that NPA are the most critical factor which has negativeimpact in financial sector of India. NPAs affect the flow of credit which in turn affect the development and growth of the economy. The research also showed that NPA alone cannot be a measure for deciding/analyzing the health of a bank. More financial heads can be considered for the research. Macroeconomic factors can also be considered for further research (Wadhwa&Ramaswamy, 2020). Kingu et al. (2018) state that increase in non-performing loans is associated with a decrease in ROA. These results support the information asymmetry theory and bad management hypothesis, which argues, that increased exposure to credit risk measured by NPLs is normally associated with an increase in operating costs and leads to decreased profitability (Kingu et al., 2018).

Different controlling variables have also been taken into consideration for the determination of the impact of NPA on profitability. Kingu et al. (2018) state that the study has shown capital adequacy ratio (CAR) is positive and significantly correlated with ROA as a result increase in CAR ratio helps to increase the profitability of commercial banks since they depend on their capital to fund assets growth which eventually reduces dependency on expensive external funding capital. Similarly, the study conducted to study the relationship between CAR and ROA states that CAR is the percentage of capital to total assets of the bank which measures the adequacy of capital, and there exists independent causality as of the result of the Granger causality Wald test whereas the OLS regression analysis in the study states that since the p-value of CAR is more than 5% so it has no significant impact on ROA (Patwary&Tasneem, 2019).

Poudel (2018) in his study says that the regression coefficients of the capital adequacy ratio are statistically significant and positive. The significant positive coefficients confirmed that the capital adequacy ratio has a significant positive impact on the profitability of the commercial banks in Nepal. This indicates that the higher the capital adequacy ratio, the higher would be the return on equity. Another research has also been

conducted in Nepal considering the controlling variable as the capital adequacy ratio which states that the capital adequacy ratio of the commercial bank has a positive relationship with firms' profitability i.e., ROA. Similarly, non-performing loan (NPL) negatively harms firm profitability that is ROE (Gnawali, 2018).

Similarly, the Liquidity ratio also plays an important role to control the non-performing assets as it has a negative relationship with profitability and is also statistically significantly related. The research has found that, as the loan to deposit ratio increases, the profit level of the bank decreases indicating that the bank is increasingly exposing itself to the risk of liquidity and also the financial distress when the liquidity ratio increases (Kingu et al., 2018). Poudel (2018) has also found that the liquidity ratio has an insignificant negative impact on profitability in Nepali commercial banks. The result contradicts the findings of Kingu et al. (2018) as it states that there exists a significant relationship. Further, to support the research findings, Ahmed and Tripati (2017) state that to maintain minimum cash in hand, a bank is bound to borrow money or mobilize deposits for a shorter period as the funds are blocked by NPAs which results in an increment in an additional cost to banks. And thus, the NPA has an inverse insignificant inverse relationship with profits and a significant negative relationship with ROE and ROA. On the other hand, different research has been done to find out the relationship between a bank's performance and interest rate spread (IRS) and found that IRS is statically significant with ROA and ROE of the commercial bank where an increase in a unit of IRS statistically changes the ROA and ROE positively at 5% significance level (Owusu-Antwi et al., 2017). Musah et al. (2018) also state that each measure of interest rate spread not only individually but jointly along with net interest margin (NIM) is undoubtedly related to bank profitability (ROA and ROE) and are all statistically significant.

From the above review of the relationship of NPA with profitability, it is very difficult to find out the actual result. Various variables such as independent, controlling, categorical and continuous could be used for the study which may possess different types of relationships such as positive, negative, significant, and no significant. These variables jointly or individually impact the performance of the bank. Also, the researcher has used various methods for the study of the relationship between NPA and the profitability of commercial banks in Nepal which is not able to define which variables exactly determine

the profits and will they determine individually or jointly. So, considerable debate always exists on the question. Are non-performing assets important for the determination of the actual profit of commercial banks? Hence, to answer the few research questions this research has been conducted by using an econometric method that has not been yet used in the developing country like Nepal where the exact relationship between NPA and profit is still uncertain. The research questions are as follows:

- What is the status of NPA in Nepalese Commercial banks?
- What is the status of ROA in Nepalese Commercial banks?
- What is the status of ROE in Nepalese Commercial banks?
- Do non-performing assets have effects on the profitability of commercial banks?
- How does NPA effect on return on assets of the Commercial banks?
- How does NPA effect on return on equity of the Commercial banks?
- How does capital adequacy ratio effect return on assets and return on equity of the Commercial banks?
- How does liquidity ratio effect return on assets and return on equity of the Commercial banks?
- How does interest rate spread effect return on assets and return on equity of the Commercial banks?

1.3 Objective of the study

The main objective of the study is to examine the impact of non-performing assets on profitability in Nepalese commercial banks. The specific objectives are as follows:

- To analyze the NPA of Nepalese Commercial Bank.
- To examine the impact of NPA on ROA.
- To examine the impact of NPA on ROE
- To analyze the impact of capital adequacy ratio on ROA and ROE.
- To analyze the impact of liquidity ratio on ROA and ROE.
- To analyze the impact of interest rate spread on ROA and ROE.

1.4 Hypothesis

The research conducted byWadhwa and Ramaswamy, 2020 states there is significant relationship between NPA and profitability. On the other hand, there also exist a significant relationship of capital adequacy, liquidity and interest rate spread with

profitability i.e. return on assets and return on equity(Noman et al., 2015; Gizaw et al., 2015; Musah et al., 2018). Thus, from these empirical evidences the research null hypothesis could be developed in the following way for the study of the relationship between dependent and independent variables:

Ho_1: There is no significant relationship betweennon-performing assets and return on assets.

Ho_2: There is no significant relationship between the non-performing assets and return on equity.

Ho_3: There is no significant relationship between liquidity ratios and return on assets.

Ho_4: There is no significant relationship between liquidity ratios and return on equity.

Ho_5: There is no significant relationship between capital adequacy ratio and return on assets.

Ho_6: There is no significant relationship between capital adequacy ratio and return on equity.

Ho_7: There is no significant relationship between interest rate spread and return on assets.

Ho_8: There is no significant relationship between interest rate and return on equity.

Here, if the P-value from regression table found to be greater than 0.05, then the null hypothesis would be accepted which implies there is no significant relationship between the variables which means the influence of dependent variable upon independent variable is not much more effective where as if the P-value is less than 0.05, then the null hypothesis would be rejected which means that there is a significant relationship between dependent and independent variable at 5% confidence level.

1.5 Rationale of study

The non-performing assets are non-contribution to the income of the bank. It is a loan asset whose recovery (principal and/or interest) has been difficult for the banks and financial institutions for various reasons. So, it is important to have a study to analyze the impact of non-Performing Assets on the profitability of commercial banks in developing countries like Nepal. Thus, the contribution of this study is to address the basics of the stated problem. In addition, the study attempts to provide an insight into the impacts of NPLs on the profitability of commercial banks and help achieve short-run and long-run organizational goals. Further, this study will be useful to university students who are curious to know about the current status of non-performing assets in the banking sector and its effect on their profitability. It is also believed that the result of this study will have the following contributions.

- Encourage the bank to develop and implement a good credit evaluation system to reduce the risk of default.
- Enable officials, executives, and customers to be aware of their respective duties and responsibilities towards satisfying mutual goals.
- Enable the managers to be aware of what is their expectation in managing loans of different firms.
- Provides knowledge to the university students and/or thesis readers about the current trend of NPA in the commercial banking sector and its effect on profitability.

1.6 Limitations of the study

This study has some limitations. The study is done for partial fulfillment of master of Business studies. Time constraints, financial problems, and lack of research experience have the primary limitations the study is based on secondary data and only a few years' data has been used for the study. The limitations of the study are given below:

- The study is limited to data contained in published financial statement and NRB reports.
- The study is limited to data contained in published financial statements and NRB reports.
- The sample size is adequate however do not contain the entire population of 27 commercial banks.

- The study is concerned with non-performing assets of commercial banks only.
- Although there are various aspects of bank management, this study is mainly concerned with the NPA aspect of the sample banks.
- Conducting the research for the academic purpose has always limited time so due to the limited time frame, depth analysis of the subject matter is not possible.

1.7 Chapter design

This study has been comprised of five chapters, each devoted to some aspects of financial performance.The first chapter of the study is an introduction, which highlighted the basic information of the research area, various problems, objectives, hypothesis, importance, limitations, and organization of the study with the subject matter consisting of historical evidence of the impact on NPA on the profitability on commercial banks in Nepal.Review of Literature is the second chapter of the study assured readers that they are familiar with important research that would be carried out in similar areas by earlier scholars in related areas. It also established that the study link in a chain of research that is developing and emerging knowledge about the concerned field.

Research Methodology the third chapter describes the research methodology adopted in carrying out the present research. It will deal with research design, sources of data, data processing procedures, population and sample, period of the study, method of analysis, and financial and statistical tools.Data Presentation and Analysis is the fourth chapter concerned with the presentation, analysis, and interpretation of data. The segment where the data required for the study are presented analyzed and interpreted by using the tools and techniques of financial management such as ratio analysis and statistical tools i.e., coefficient of variation, correlation coefficient, and regression analysis using the econometric method is specified form to meet the stated objectives of the study. Summary and Conclusion along with the implication is the fifth and the final chapter concerned with the suggestive framework that consists of the overall findings, conclusions, and recommendations of the study. Besides the above chapters, this study paper consists of a separate appendix and bibliography for those materials and books which has been used in the process of preparing this thesis report. It also gives important suggestions to the concerned organization for better improvement. At the end of the chapter references and an appendix has been incorporated.

CHAPTER II
LITERATURE REVIEW

2.1 Theoretical review

The review of the relevant theories which explains the effects of nonperforming loans on profitability of commercial banks in Nepal are described in the theoretical review. The theoretical reviews covered by the research are Asymmetric information theory and Modern portfolio theory.

2.1.1 Asymmetric information theory

Asymmetric information theory is applicable for those situations where imperfect knowledge exist (Akerlof, 1970). Imperfect knowledge refers to the condition where one party has different information than that of another. The problem raised in financial market regarding borrowing and lending is referred to the Asymmetric. In these markets the borrower has much better information about his financial state than the lender. Akerlof (1970) first presented this theory in the easy; "The Market for Lemons". It is the single most important study in the literature on economics of information. The theory explains that in the market, the party that possesses more information on a specific item to be transacted (in this case the borrower) is in a position for making negotiation of optimal terms in order to transact than the other party (in this case, the lender). Commercial bank managers may know more about effects of nonperforming loans on profitability of commercial banks than other stakeholders. In this case, they could fail to disclose nonperforming loans and/ or use provisions for losses on non performing loans for profit smoothening.

2.1.2 Modern portfolio theory

Markowitz (1952) Modern portfolio theory (MPT) is one of the most important and powerful economic theories dealing with finance and investment. The diversification benefits is described and measured by Modern portfolio theory also known as "not putting all your eggs in one basket". Modern portfolio theory (MPT) is an investment theory that helps to describe how investors could maximize their returns and minimize their risks by diversification in different assets. The theory also advocates that the ability

to obtain maximum profits that depends on the feasible set of assets and liabilities which is identified by the management and the cost of units suffered by the bank for producing each component of assets. Diversifying investments portfolio should be considered by commercial banks to minimize risk of credit takers defaulting in loans repayments and causing non-performing loans portfolios that affects profitability. The supporter of diversification activity or product mix argue that diversification provides a stable and less volatile income, economies of scope and scale, and the ability to leverage managerial efficiency across products and for the case of commercial banks, reduce non performing Loans and increase Return on Assets which is a measure of profitability.

Thus, the theoretical review clearly states that the non performingassets have its impact upon the profitability. The theory like Asymmetric information theory and modern portfolio theory describes the aspects of influence of risk associated with assets in commercial banks with that of profit.

2.2 Conceptual framework

2.2.1 Loan and advances

The main function of commercial banks is to generate resources or funds and provide loans and advances. It is the most profitable asset of the bank. Loans and advances dominate the assets side of the balance sheet of any development bank. Similarly, earnings from such loans and advances occupy a major space in the income statement of the bank. It is the asset that fetches income for the bank. The profitability of the development bank depends upon the extent to which it grants loans and advances to customers. The loan is granted in the form of overdraft, cash credit, and direct loan against adequate security. Banks should take into consideration safeties of loans and advances at the time of lending rather than focusing only on profitability. At the time of lending the loan, the banks must carefully study the lending sectors and make a sound policy for rendering a loan. The policy should contain the Credit Deposit Ratio (CDR) that the bank wishes to maintain. CD ratio is very much influenced by the behaviors of a bank's liabilities. The higher the volatile deposits and volatile borrowing lower the volume of loans and vice versa (Vaidya, 1999).

2.2.2 Performing loan

Performing loans are those loans that repay principal and interest timely to the bank from the cash flow it generates. Loans have a certain time to return their principle with its interest. If anyone repays a loan with its interest on time, it is known as a performing loan. It is the most profitable asset of banks. It helps in the rapid growth of the banking sector in this fast-paced competitive age. Better performing loans are the symbol of the success of banks. But many banks are suffering from the non-repayment of the loan amount (Vaidya, 1999).

2.2.3 Non-performing asset/loan

One of the most emerging problems of the development bank is the management of nonperforming assets/loans. Due to the effects of non-performing assets/loans, many banks have already closed down. In this fast-paced competitive age, development banks should have to operate by taking into consideration the risks involved. Those loans, which do not repay principal and interest on time to the banks, are known as non-performing assets (NPAs). If any advances or credit facilities granted by a bank to a borrower become nonperforming, then the bank will have to treat all the advance/credit facilities granted to that borrower as non-performing without having any regard for the fact that there still exist certain advance/credit facilities having performing status (Shrestha, 2007). NPAs have different meaning that varies from country to country. In some countries, it means that the loan is impaired. In some countries, it means that the payment is due but there is a significant difference among countries in regards to how many days a payment should be in arrears before past due status is triggered (Shrestha, 2007). According to the current banking Act, Bank and financial institution Act (BAFIA) 2006, the banks have to make provisions for bad and doubtful debts.

A bank is judged based on capital, assets quality, management, earnings, liquidity, and sensitivity to market risk. Though almost all the private sector banks are showing a profit, it is very difficult to call them sound if appraised from the capital, assets quality, management, earning, liquidity and sensitivity to market riskapproach (Dahal&Dahal, 2002). Some banks have very low Capital Adequacy Ratio (CAR) while some banks have piled up non-performing assets (NPAs). Similarly, banks don't have a proper system in place for the management of market risks. People have been raising questions over the

correctness of credit classification and provisioning of some banks. Should the suspicion come true, it will prove very costly to the depositors, creditors, and the national economy as a whole. It would be prudent to advise NRB to strictly implement its recently introduced directive so that other banks avert the fate of NBL, 26 RBB, and NIDC (Dahal&Dahal, 2002).

The NRB unified directives states that loans are categorized into two types i.e., performing loans and non-performing loans whereas non-performing asset (NPA) refers to a classification for loans or advances that are in default or arrears (Nepal Rastra Bank, 2021). A loan is in arrears when principal or interest payments are late or missed. A loan is in default when the lender considers the loan agreement to be broken and the debtor is unable to meet his obligations. NPA is said as classified loans according to the NRB directives categories into sub-standard, doubtful, and loss. The circular further says an NPA is a credit facility in respect of which interest has remained unpaid for two quarters. According to the circulars, the loans are classified based on weakness and dependence on collateral securities into five categories and prescribed the provisioning rate in Table 1.

Table 1

Loan classification and Provision as per NRB directives

Classification of Loan	Duration overdue	Loan loss provisions
Pass	Up to 1 month	1%
Watch list	1 month to 3 months	5%
Sub standard	3 months to 6 months	25%
Doubtful	6 months to 1 year	50%
Loss	1 year and above	100%

Source: Nepal Rastra Bank, Directives for commercial banks.

The banking system is a volatile and sensitive sector of the national economy, which requires effective monitoring and supervision. Nepal Rastra Bank (NRB) issues various directives and guidelines from time to time with modifications and amendments for the sound regulations of the banking system. Nepal Rastra Bank (NRB) has amended the provision related to the classification of loans of banks and Financial Institutions (BFIs). BFIs were earlier required to classify loans into 4 categories i.e., Pass, Substandard, Doubtful, and Loss, depending on the duration of delay in debt servicing. Now they have added one more category—Watch List. The category of loans is as follows.

Pass/ Good: Loans and advances whose principal amounts are not past due and past due for a period of up to 3 months are included in this category. These are classified and defined as performing loans.

Watch List: Watch list also includes loans that have not been serviced for three months. But watch list includes loans whose principal and interest have not been paid within the repayment period.

Substandard: All loans and advances that are past due for a period of 3 months to 6 months are included in this category.

Doubtful: All loans and advances which are past due for a period of 6 months to one year are included in this category.

Loss/Bad: All loans and advances which are past due for more than one year as well as advance that have the least possibility of recovery or are considered unrecoverable and those having the thin possibility of even partial recovery in the future are included in this category.

The sum of the total loans classified as sub-standard, doubtful, and loss loans is referred to as the non-performing assets (NPAs) where the provision of loss on non-performing assets reduces the profits of commercial banks. Nepalese Commercial banks are facing several problems and challenges that have constrained the growth of efficient financial markets. Every commercial bank's profitability is currently affected by its non-performing assets. However, several measures have been devised and implemented to minimize the risk of non-performing loans. Among these is seven out of twenty-five core principles of effective banking supervision by the BASEL Committee on banking supervision in 1997, a part of which says, sustaining sound assets quality involves careful granting of loans that must be examined and compliance with banking rules (BASEL, 1997).

2.2.4 Effect of NPA

NPAs affect profitability, liquidity, and competitive functioning of public and private sector banks and finally the psychology of the bankers in respect of their disposition towards, credit delivery and credit expansion. Increasing Non-Performing Assets (NPAs) has direct effects on banks, investors, and customers. It has also a negative impact on the

economic health and business of the country. It has two types of effects (Batra&Dass, 2003).

Internal Effect

Banks can't mobilize non-performing assets to increase profitability. In addition to this bank have to make provision for doubtful debts from their profits and other sources. That's why the profit of the banks gets decreased. This results in capital erosion and capital inadequacy. In the present context, the capital adequacy ratio of "A' class commercial bank is 6 percent of core capital and 11 percent of capital fund(including conservation buffer), and of 'B' and 'C' class financial institutions, it is 5.5 percent of core capital and 11 percent of capital fund (Nepal Rastra Bank, 2021). The central bank of the country can take action to their banking activities, which banks have lower capital or capital adequacy ratio. When the non-performing assets increase, banks have to increase the amount of provision for doubtful debts and when the loan is repaid, the amount can be treated as profit. If the provision for doubtful debts crosses 5 percent of the total loan amount, the bank has to pay income tax as profit. So, it has a direct effect on the cash flow of the bank. As a result, the employment of human resources and the profit of the bank are also affected. It also affects the profitability of bank as NPAs has negative impacts on the profitability of the banks. Non- Performing assets are the idle assets of the banks, which do not generate any return for the banks. Thus, we can say that the NPAs reduce the profitability of the banks as it does not generate interest income. A high level of NPAs affects the image and prestige of banks and financial institutions.

External Effect

The banks accept deposits from the public and provide loans for the operation of the business and other purposes. When the loan does not return with its interest, it becomes a non-performing asset and banks might face the situation of not being able to make customer payments for the demand deposit. If banks are unable to make payment against the deposited amount, the bank loses public support and faith. Banks reach a situation wherein they have to take the loan at a higher rate to pay the deposit, which directly affects the profitability of banks and which leads the bank to bankruptcy and liquidation. It also affects the monetary system and economy of the country (Batra&Dass, 2003).

2.3 Review of literature on the effect of NPA on profitability

Non-performing loans are one of the elements that play a great role to create a halt in the performance of commercial banks. Many researchers have been conducted to study the core impact of NPA on the profitability of commercial banks in different parts of the world. As per the study conducted, there is an upward trend in total advances, gross NPA, and net NPA due to which profitability of the bank is being gone downward (Lyngdoh, 2018). Likewise, Lucky and Nwosi (2015), state that the percent of non-performing loans to Total Loans and percent of nonperforming Loans to Total Customers' Deposits have a positive relationship with Return on Investment. Thus, to explore different researches conducted in different parts of the world, Table 2 shows the literature review on the effect of NPA on profitability.

Table 2

Literature review on the effect of NPA on profitability of commercial banks

Study	Major findings
Gizaw et al. (2015)	LQDT ratio, the ratio of total loans to deposit has no statistically significant relationship with ROE.
Noman et al. (2015)	The relationship of CAR is found negative and significant on ROE.
Shingjergji and Hyseni (2015)	There exists negative relationship between CAR and ROE as Capital strength measured by the ratio of equity over total assets bears a negative influence on ROE.
Lucky and Nwosi (2015)	The percent of non-performing loans to Total Loans and percent of nonperforming Loans to Total Customers' Deposit have positive relationship with Return on Investment.
Kiran and Jones (2016)	There exists negative significant relationship between gross NPA and net profits.
Ahmed and Tripati (2017)	Inverse relationship between NPA and ROE and is statistically significant.

Owusu-Antwiet al. (2017)	Interest rate spread (IRS) has significant positive relationship with ROA and ROE.
Lyngdoh (2018)	There is upward trend of total advances, gross NPA and net NPA due to which profitability of the bank is being going downward.
Manu and Maheshwari (2018)	Negative significant relationship between NPA and ROA.
Musahetal. (2018)	Interest rate spread is positively associated with bank profitability i.e., ROA & ROE and are all statistically significant.
Kingu et al. (2018)	Negative and statistically significant as the ratio of loan to deposit increases, the ROA of bank decreases and Positive and statistically significant with ROA as the ratio of CAR increases, the ROA of banks moves upward.
Fidanoski et al. (2018)	No trade-off between liquidity and profitability i.e. ROA is positively affected by liquidity ratio.
Patwary and Tasneem (2019)	No significant impact between CAR and ROA as there exist independent causality.
Arasu et al. (2019)	There is significant positive relationship between Gross NPA and Net NPA where as significant negative relationship between NPA with Return on Assets (ROA) of public & private sector banks.
Nachimuthu and Veni (2019)	There exists negative significant relationship of profitability with gross NPA and net NPA.
Wadhwa and Ramaswamy (2020)	There exists negative significant relationship between NPA and profitability of the bank measured by net profit.
Hersugondo et al. (2021)	There is a significant negative relationship between NPA and ROE.
Gaur and Mohapatra (2021)	Positively insignificant relationship exists between LQDT and ROE.

Gizaw et al. (2015) studied the impact of credit risk on the profitability performance of commercial banks in Ethiopia along with the data of 12 years period i.e., from 2003 to

2014 of 8 commercial banks where the data were collected from the annual reports of the banks. The collected data were then analyzed using descriptive statics and a panel data regression model where the result showed there is an insignificant relationship between LQDT and ROE since the value of the coefficient is -0.0005 whereas other variables like capital adequacy ratio and loan loss provision ratio showed a positive relationship with ROE. Since LQDT is the ratio of total loan to deposit, the ratio indicates how far the bank is using the depositor's fund on credit activities which is riskier to the bank since it may be exposed to default. So, a higher LQDT ratio implies a greater risk to the bank's performance in terms of profitability which has been justified by the random effect estimation model. Thus, the study recommends the creation of strong credit risk and loan service process management to keep the level of NPA under control to maximize the profits of the commercial banks.

Noman et al. (2015) conducted a study on the effect of credit risk on banking profitability along with the panel data of 172 observations of 18 commercial banks in Bangladesh. The study was conducted over the data for 12 years i.e., 2003 to 2013 with a focus on the dependent variables like ROA, ROE, and NIM as profitability indicators and independent variables like nonperforming ratio, the ratio of loan loss reserve to gross loan, the ratio of loan loss reserve to non-performing assets and CAR. The statistical tools like mean, standard deviation, and ordinary least square (OLS) method are applied for the analysis of data and revealed that there exists a negative and significant relationship between CAR and ROE. The increase in Capital adequacy tends to increase the strength of the bank which improves the solvency of the bank and capacity to absorb the loan loss and also protects the bank from bankruptcy. The results from the analysis showed that there is a positive effect of capital adequacy ratio on return on average assets and net interest margin and exist positive significant relationship whereas effects return on average equity is negative and there exists negative and significant relationship. Thus, the study concludes that the banks need to use an effective credit risk management process to ensure profits and make banks safe from bearing loss and crisis.

Shingjergji and Hyseni (2015) studied the determinant of capital adequacy ratio in the Albanian banking system along with the study period of 11 years i.e., 2007 to 2014. For the study, 16 private banks were taken where a regression model like ordinary lease square analysis is taken to test the relationship between dependent and independent variables. Here, the dependent variables are capital adequacy ratio (CAR) and the

independent variables are ROA, ROE, non-performing loans (NPL), bank size, equity multiplier, and loan to deposit ratio. The study uses the econometric model of testing with a hypothetic assumption that ROA and ROE do have a statistically significant impact on capital adequacy ratio in the Albanian banking system where the study revealed that the beta coefficients of ROA and ROE are negative i.e., -0.1983 & -0.0102, showing a negative relationship between bank's profitability and CAR. Thus, the study states that there exists a negative relationship between CAR and ROE as Capital strength measured by the ratio of equity over total assets bears a negative influence on ROE.

Lucky and Nwosi (2015) conducted a study on the asset's quality and profitability of commercial banks in Nigeria. This study tested the connection between asset excellence and the profitability of the fifteen (15) quoted commercial banks in Nigeria from 1980 to 2013. The objective of the study was to research the connection between capital, assets quality, management, earning, liquidity and sensitivity to market riskstandards for asset quality and the profitability of Nigerian commercial banks. Secondary statistics had been sourced from annual reviews of the quoted commercial banks. Return on Investment (ROI) was considered as a dependent variable and of non-performing loans to Total Loans (NPL/TL), percent of Nonperforming Loans to Total Customers' Deposit (NPL//TCD), percent of Loan Loss Provision to Total Loans (LLP/TL) and percent of Loan Loss Provision to Total Asset (LLP/TA) were taken as an independent variable for the study. Multiple regressions with an econometric view statistical method had been used as a statistical evaluation method. The Ordinary Least Square properties of Augmented Dickey-Fuller Test, Co-integration, and Granger Causality check had been done to decide the short and long-run effects among the dependent and the independent variables. Findings from the regression result proved that the percent of non-performing loans to Total Loans and percent of nonperforming Loans to Total Customers' Deposit have a positive relationship with Return on Investment at the same time as the percent of Loan Loss Provision to Total Loans and percent of Loan Loss Provision to Total Asset have a negative relationship with Return on Investment of the commercial banks. It recommends that financial institution lending surroundings have to be nicely tested earlier than and after credit scores and the regulatory government ought to make certain sound bank lending surroundings to keep away from the occurrence of non-performing loans to assure the profitability of business banks in Nigeria.

Kiran and Jones (2016) studied the relationship between NPA and profitability of five nationalized Indian banks with selective data for the year 2005 to 2014 intending to compare the performance of the top bank in the industry with least five banks in terms of managing NPA. The study was conducted along with the sample of six public sector banks having the highest NPA as per the data provided by the finance ministry in the recent past where gross NPA and Net NPA were taken as independent variables and Net profit as the dependent variable. The study revealed that all the banks possess a negative correlation between gross NPA and net profits whereas for SBI, the net profit is not being affected by gross NPA and the profits are continuing. The study concluded with the findings that there is a gradual increment in the NPA of banks in India where large banks can maintain the losses by NPA, for example, SBI bank is having profits even though there are huge losses whereas the smaller one is facing great problem for its recovery.

Ahmed and Tripati (2017) researched to analyze the non-performing assets and profitability of scheduled commercial banks of India for the period of eight years (2009-2016). The research was focused on the objective to assess the impact of NPAs on the performance of scheduled commercial banks. Various statistical tools like regression analysis and t-tests are used to test the significance of the selected dependent and independent variables. The study focuses to analyze the trend of NPA and its impact on ROE. The hypothesis testing along with the assumption that there is no significant negative impact on NPAs and ROE was rejected as the study found that there is an inverse relationship between NPA and ROE along with the coefficient value of -1.963 and is statistically significant as the p-value is less than the significance level increasing trend of ROA due to declining trend of NPA ratio (Ahmed &Tripati, 2017). The study concludes with the statement that the high incidence of NPA has a major impact on the financials of a bank's profit i.e., ROE and NPA possess a negative significant relationship implying the deleterious impact on various parameters of bank performance. Similarly, results of statistical analysis indicate that NPAs have an insignificant inverse relationship with profit, a significant negative impact on ROA, and a significant positive impact on the Cost to Income ratio and Provision. As such, NPAs put a detrimental impact on the bank's performance. The study focusses to find out the impact of NPAs on ROA and reveals that there is an inverse relationship between NPA and ROA as the p-value is less than the significance level. The hypothesis test assuming there is no significant negative impact of NPA and ROA has also been rejected as the study found that there exists an

inverse relationship which implies banks can experience the increasing trend of ROA due to the declining trend of NPA ratio.

Owusu-Antwi et al. (2017) conducted a study on the impact of Interest rate spread on bank profitability. The reason for the study was to empirically investigate the effect of interest rate spread on the profitability of a commercial bank in Ghana using average annual statement statistics from1992 to 2015 consisting of 28 commercial banks. The ordinary least square method was used to estimate the regression coefficients. The variables like ROA, net interest income, operating cost, total assets and bank size were taken for the study. The result of the empirical study showed that the defined elements play a giant function in the determination of interest rate spreads in Ghana's banking sector. The study revealed that IRS is statically significant with ROA and ROE of the commercial bank where an increase in a unit of IRS statistically changes the ROA and ROE positively. Besides, all other coefficients for bank-specific variables have the predicted signs and are highly statistically significant at one percentage in all of the expected equations besides the operating cost ratio that's significant on the 5 percent significance level. The fundamental regression data indicates that R2 (53.3%) is relatively high implying that the overall goodness of fit of the model is satisfactory. It additionally means that approximately 53.3% of IRS variation is defined through the model.

Lyngdoh (2018)analyzed the impact of NPA in IDBI Bank in India to find compare the trend of total advances, net profit, gross NPA, and net NPA over 5 years. The financial, as well as statistical tools for the research like ratio analysismean and compound growth rate have been used to analyze the data. The study found that NPA has dynamically grown and affected the profitability of IDBI bank. The study experience that, there is an upward trend of total advances, gross NPA, and net NPA due to which profitability of the bank is being affected. It is because the number of willful defaulters has been increased from 3% to 20 % throughout the study and hence the study suggests that the bank must use two strategies to prevent slippage of standard assets in NPA by following certain practices and also reducing NPA through recovery, settlements, and up-gradation of assets since both gross NPA and net NPA are increasing sharply which is reducing the performance of the bank as well as the miss management of the bank.

Manu and Maheshwari (2018) investigated the relationship between non-performing assets and profitability of development banks of India for two development banks (IFCI and IDBI) considering ROA, ROE, and ROCE as measures of bank's profitability and Gross NPA and Net NPA as measures non-performing assets of the banks. The study used multiple regression analysis to analyze the impact of non-performing assets on banks' profitability. The regression results found that net NPA harms the profitability of IFCI and no impact of NPA on the profitability of IDBI. The result found that the probability value of Net NPA concerning ROA of IFCI is less than 0.05 thus there exists a significant relationship at the 5% level which implies that the decrease in NPA causes an increase in ROA of IFCI bank. Thus, the research concluded that the increasing trend of NPA of the public sector bank is a major concern to the Indian economy as it possesses a negative impact on profitability i.e., ROA of the development banks. So, the study recommends implementing stringent policies by the regulatory authorities to control the continuous increasing trend of banks' NPA which will hedge the loss of tax payer's money in India.

Musah et al. (2018) studied the impact of interest rate spread on bank profitability in commercial banks of Ghana. The research examines the impact of interest rate spread on the profitability i.e., ROA and ROE of commercial banks in Ghana. The observe measured interest rate spread along with the use of net interest income (IntSp) and net interest margin (NIM) and bank profitability using Return on Assets (ROA) and Return on Equity (ROE). The study is primarily based totally on a sample of 24 banks over a ten-year length using panel data. The effects of the observation display that there prevails a positive and statistically significant link between interest rate spread and bank profitability in Ghana. The study focuses on the quantitative method for the evaluation of data along with panel regression as the study seeks to set up the connection between interest rate spread and bank profitability in Ghana. The study relies on a secondary source of data accumulated from annual reviews of commercial banks in Ghana and found that each measure of interest rate spread (IntSp and NIM) is undoubtedly related to bank profitability (ROA and ROE) and are all statistically significant.

Kingu et al. (2018) have studied the impact of non-performing loans on bank's profitability of 16 commercial banks in Tanzania using panel data from 2007 to 2015 and found that an increase in non-performing loans along with the controlling variables like liquidity ratio, capital adequacy ratio and the gross domestic product is associated with a

decrease in ROA. These results support the information asymmetry theory and bad management hypothesis, which argues, that increased exposure to credit risk measured by NPLs is normally associated with an increase in operating costs and leads to decreased profitability. The econometric method including the financial tools like mean, median, standard deviation, skewness, kurtosis, correlation, and regression is used to analyze the relationship between dependent and independent variables. The study found that the coefficient of the LQDT ratio is negative and statistically significant since the study is experiencing that the increase in loan to deposit ratio is decreasing the profit level of banks. The higher LQDT ratio implies that the bank has reached its limit of funding the loans from its deposit and tends to use more expensive sources of funding such as collecting an expensive deposit, debt, and equity to fund its loan book which causes a reduction in the level of profitability i.e., ROA (Kingu et al., 2018). Thus, the study concludes that the increase in NPA along with the increase in LQDT ratio tends to decrease the profitability which results in exposure to credit risk measured by NPA is normally related to the increase in operating costs resulting decrease in profitability. The study also focused on the econometric method along with the financial tools like mean, median, standard deviation, correlation, and regression analysis and found that there exists a positive relationship between CAR and ROA and it is statistically significant. The result implies that an increase in capital adequacy ratio has explanatory power over the rise of profit i.e., ROA. Since the bank has a higher CAR ratio, they depend upon their capital which reduces the expensive cost of external capital funding and hence increases profits for banks (Kingu et al., 2018). The capital adequacy ratio measures the amount of a bank's capital relative to the amount of its risk-weighted credit exposure so it indicates that the higher the CAR, the higher will be the profits and hence the study also concludes that there is a positive and statistically significant relationship between CAR and ROA since the increase in CAR enables ROA to move towards upward.

Fidanoski et al. (2018) conducted a study to determine the impact of bank-specific, industry-specific, and macro-specific determinants of profitability considering the selective banks of Croatia for the period 2007 to 2014. Panel data analysis were done along with the tools like robust econometric tests, and dynamic estimation technique to estimate the models of profitability along with the ROA and RNIM as dependent variables and independent variables like assets size, loan portfolio, investment portfolio, risks, liquidity, capital adequacy, leverage, operational efficiency, off-balance-sheet

activities and other industry-specific determinants along with macro specific determinants. The study was conducted with an expectation that Due to the traditional trade-off between liquidity and profitability, the liquidity will negatively harm the profitability but the study revealed that there is no trade-off between liquidity and profitability and there exists a positive significant relationship between LQDT and ROA. The value of the correlation coefficient between LQDT and ROA including all the variables is found to be 0.079where as excluding the external variables is found to be 0.095 which is positively correlated with each other. This implies the increase in loan to deposit ratio has a positive effect on the profitability of banks i.e., ROA and hence the increase in increase in LQDT increases the ROA of banks as the bank has its capacity to fund the loan and does not need any external expensive source of funding. Thus, the study concludes with the recommendation that monetary authorities should reshape the policies, government bodies should improve fiscal management and banks should concentrate on different controlling variables to increase their financial result.

Patwary and Tasneem (2019) researched to evaluate the impact of the non-performing loan on the profitability of banks in Bangladesh. The research discovers the impact of the non-performing loan ratio, capital adequacy ratio, and provision maintenance ratio on the return on asset (ROA) of all banks based on the last twenty-one years' data i.e., 1997 to 2017. This study also investigated the root causes and adverse effects of the non-performing loan. The results of the study revealed that there are different directional short-run causality exists between variables and the Ordinary Least Square(OLS) regression analysis confirmed that two independent variables; non-performing loan ratio and provision maintenance ratio are statistically significant to the dependent variable; return on asset (ROA). The study states that CAR is the percentage of capital to total risk-weighted assets of the bank which measures the adequacy of capital and there exists independent causality as the result of the Granger causality Wald test whereas the OLS regression analysis in the study states that since the p-value of CAR is more than 5%, it has no significant impact on ROA.

Arasu et al. (2019) have conducted a study on the analysis of non-performing assets and their impact on profitability with a prime objective to understand the level of Non-performing Assets (NPA), and how it influences the profitability of the banks. For this purpose, the study considered the Gross and Net NPA of 10 Public & Private sector banks

from April 2014 to March 2018. The study identified that both the public and private sector banks gradually increase their Gross & Net NPA during the period. The study found that there is a significant positive relationship between Gross NPA and Net NPA of public and private sector banks. The study also found a significant negative relationship between NPA with Return on Assets (ROA) of public & private sector banks. The research was carried out with different specific objectives i.e., to know the level of NPA of private and public sector banks, to identify the impact of NPA on profitability, and to provide recommendations to the policy-making authorities. Different statistical tools like mean, standard deviation, correlation, and linear regression with the hypothesis of there are no significant relationship between NPA and ROA of sample banks and there is no impact of NPA on profitability.

The study revealed that both net NPA and gross NPA of all public and private sector banks moved gradually upward from 2014 to 2018 and found that gross and net NPA of public and private sector banks has a significant positive relationship and negative significant relationship between NPA and ROA. However, due to the impact of ownership, the NPA of public sector banks was higher than that of private sector banks (Arasu et al., 2019)

Nachimuthu and Veni (2019) aimed at investigating the impact of non-performing assets on the profitability of Indian scheduled commercial Banks. The study discussed the impact of NPA on the profitability of India's scheduled commercial banks for the past ten years from 2007-2008 to 2016-2017 and concluded that non-performing assets on the profitability negatively harm the scheduled commercial banks in India. In this paper, the authors had tried to give a critical view of NPA and try to give some possible solutions to resolve the effect of NPA on the banking sector. The various analyses were used to find out the impact of NPAs on the profitability of the scheduled commercial banks. It was significantly related to the Ratio of Gross NPA to Gross Advances Ratio of Net NPA to Net Advances, Ratio of Gross NPA to Total Assets and Ratio of Net NPA to Total Assets are insignificantly related to each other. Thus, the profitability of the banks has reduced, due to the rise in the non-performing assets of the scheduled commercial banks in India.

Wadhwa and Ramaswamy (2020) state that the research attempts to analyze the impact of a few important financial heads on the NPAs of banks and to suggest the effective

management of NPAs. According to RBI data, five banks (public and private) with the highest NPAs were taken for the study for the period 2014-2015 to 2018-2019. The research applied correlation analysis to compute the relationship between net profits and NPAs and multiple regression analysis to determine the impact of important financial heads on NPAs. Multiple Regression results show that although the financial heads as individual variables do not have a significant impact on NPAs of banks except SBI. However, in SBI and HDFC bank the impact on NPA is quite significant when the financial heads are taken together. The study also revealed that there exist a negative significant relationship between NPA and the profitability of the bank where an increase in non-performing assets is decreasing the net profit of the commercial banks in India.

Hersugondo et al. (2021) in their study show the relationship between NPA and ROE considering the study of the role of non-performing assets, capital adequacy, and insolvency risk on bank performance. The study was conducted on the banks of Indonesia where the sample of 470 observations was taken from the period of 2015 to 2019. The study showed that there exists a significant negative relationship between NPA and ROE in commercial banks. So, the study was conducted to help the banks to understand the procedure to manage the risks they face. The study used size and age as controlling variables to study the impact of NPA on the ROE of the selected banks. The study used panel data regression analysis and found that there is a significant negative relationship between NPA and ROE, both with and without control variables. The study concludes that non-performing assets as whole harm the performance of banks in terms of ROE in both state-owned and private commercial banks. So, the higher the level of problem loans, the lower will be the performance of and bank and its profitability as a whole. Thus, the bank must take necessary steps to increase ROE and decrease NPA to make the bank healthy in long run.

Gaur and Mohapatra (2021) conducted a study on non-performing assets and profitability of 37 commercial banks of India using the panel data analysis over 14 years i.e. 2005 to 2018. The study was conducted to examine the determinants of banks' performance and to investigate the significance of the impact of NPA on the performance of commercial banks in India. Correlation and regression analyses were performed to examine the relationship among the dependent variables like ROA and ROE and independent variables like net interest margin, management efficiency, NPA, liquidity management,

capital strength, operating efficiency, size, GDP, and the monetary policy interest rate. The study focuses also on liquidity management as an independent variable which is measured in terms of cash and cash equivalent and customer deposit. The study shows there exists a positively insignificant relationship between LQDT and ROE of the commercial banks since the coefficient value is 0.017 with ROE. Thus, the study concludes that the impact of liquidity management is not very large so it can be stated that the profits of Indian banks are not very much affected by the proportion of liquid assets. However, the impact is positive and thus, the availability of liquid assets can be seen as a positive sign for ROE.

The reviews in the above literature state that, NPA has an inverse negative relationship with the profitability of commercial banks. Different statistical tools such as mean, median, correlation, and regression analysis were used for the study of the relationship between NPA and profitability of commercial banks along with different controlling variables such as CAR, LQDT, and Bank size. Most of the results found that the profitability of commercial banks in terms of ROA and ROE is reducing due to the increase in NPA along with the influence of its different controlling variables and hence has a significant negative relationship. So, this study is very much important to know the reliability of exact findings of the relationship between NPA and the profitability of commercial banks in Nepal.

2.4 Literature review of Nepalese article on the effect of NPA on profitability

In context of Nepal, different studies have also been conducted to explore the relationship between NPA and profitability of commercial banks. The areas of study should also cover the review of literature done in home country as there might be difference in results of the findings due to nature and size of bank compared to the international banks, tools and techniques used in the research. Thus, some review of literature has also been done in the Nepalese articles which could be tabulated in Table 3;

Table 3

Literature review on Nepalese article

Author	Major findings
Bhattarai (2016)	Non-performing loan ratio has negative effect on overall bank profitability i.e., ROA and ROE.
Gnawali (2018)	There exists negative relationship between NPL and profit i.e., ROA and ROE and positive relationship between CAR, LQDT, loan loss provision profits i.e. ROA and ROE.
Poudel (2018)	Credit risk has the significant negative impact on profitability i.e., ROE of commercial banks.
Panta (2018)	The net interest margin has positive and bank size has negative significant relationship with the non-performing loan.
Pokharel (2020)	ROA, Bank Size, GDP, and Inflation have a significant impact on NPL however CAR does not have a significant impact at the NPL of banks.

Bhattarai (2016) studied the effect of non-performing loans on the profitability of commercial banks in Nepal. This study has examined the effect of non-performing loans on the profitability of Nepalese commercial banks using the data of 14 commercial banks with 77 observations during the period 2010 to 2015. The variables like ROA, ROE, non-performing loan ratio, size, gross domestic product, and inflation rate are used for the study. The regression analysis was used to analyze the data and the estimated regression results reveal that the non-performing loan ratio harms negatively in overall bank profitability (ROA) on the other hand non-performing loan ratio has a positive effect on shareholders' return (ROE). The results also showed that bank size has a significant positive effect on bank profitability (ROA, ROE) and states that cost per loan has a significant positive association only with overall bank profitability (ROA). The gross domestic product growth rate has a significant positive effect only on shareholders' return (ROE). Thus, this study concludes that the profitability of Nepalese commercial banks is influenced by the non-performing loan ratio.

Gnawali (2018) studied the study of non-performing assets and their effects on the profitability of Nepalese commercial banks from 2010 to 2017 for 3 government banks and 10 nongovernment banks with 24 and 80 observations respectively. The dependent variables such as ROA and ROE were taken for the study on the other hand independent variables were non-performing loans ratio, loan loss provisions, capital adequacy ratio, liquidity ratio, and size of the firm. The study was conducted to assess the relationship between the non-performing loan and a firm's financial performance in Nepalese commercial banks where the result found that there exists a negative relationship between NPL and ROA and a positive relationship between CAR, LQDT, loan loss provision, and ROA. The regression models were estimated to test the significance and impact of the non-performing loan on the profitability of Nepalese commercial banks. The result also shows that CAR, LQDT, and size have a positive relationship with ROE which means the higher the CAR, LQDT, and size, the higher would be the ROE. Similarly, size, NPL, and loan loss provision ratio have a negative relationship with ROA which means an increase in the size, NPL, and loan loss provision ratio decreases the ROA. Likewise, NPL and loan loss provision ratio have a negative relationship with ROE which indicates that the higher the NPL and loan loss provision, the lower would be the ROE.

Poudel (2018) studied the impact of credit risk on the profitability of commercial banks in Nepal along with a sample of 15 commercial banks that are currently in operation in the Nepali economy were considered for the period 2002/03 to 2014/15. Variables such as ROE, capital adequacy ratio, interest spread rate, solvency ratio i.e., liquidity ratio, and GDP were taken for the study to access the impact of NPA on the profitability of the selected commercial banks. The financial tools such as ratio analysis and statistical tools like mean, standard deviation, correlation, and regression were taken for the study. The results confirmed that credit risk has a significant negative impact on the profitability of commercial banks in Nepal. The solvency ratio, interest spread rate, and inflation have an insignificant negative impact on profitability whereas the capital adequacy ratio, total assets, and GDP growth have a significant positive impact on the profitability of commercial banks in Nepal and the inter-bank interest rate has an insignificant positive impact on profitability.

Panta (2018) conducted a study on non-performing loans and bank profitability of joint venture banks in Nepal which investigated the macroeconomic determinants of non-performing loans specified by the bank in addition to their effect on profitability. It

considered secondary data of seven banks from the period 2006 to 2017 and applied a fixed effect panel version for evaluating 3 different empirical equations. Capital adequacy, net interest margin, and the size of banks measured through total assets & loan to deposit ratio are considered the bank-specific variables. And the macroeconomic variables consist of GDP growth, inflation, and loan concentration of the banking enterprise. A non-performing loan is taken as an independent and dependent variable; firstly, to discover its determinants and the variable that comes significant for the duration of the system of locating the determinants is taken because of the variable that influences the profitability. The study revealed the net interest margin and bank size become the determinants of the non-performing loan & advised that net interest margin has a positive and significant impact at the same time as the bank size has a negative and significant relationship. Furthermore, while the net interest margin, bank size & non-performing loans are used as the independent variable, their significant impact is visible with the profitability. Three conclusions derived from this study are: first off because the net interest margin raises for the banks so does the bankability to earn from the interest income which will increase the profitability. Secondly, the growth inside the non-performing loan erodes the interest income decreasing the profitability & finally because the asset size will increase so do the bad management practices as there are large operations to be treated through the bank, consequently hindering the profitability.

Pokharel (2020) studied the effect of non-performing loans on the profitability of Nepalese commercial banks. The foremost goal of this study was to discover the impact of Non-Performing Loan (NPL) on Nepalese traditional banks. The population of the study was the foremost commercial banks in Nepal and the records received for this study were from the duration 2015 to 2019. This study used secondary data extracted from respective bank's annual reports and GDP and Inflation taken from the World Bank database. The approach used for data evaluation in this study is multiple regression evaluation. The study considered nonperforming assets (NPA) as a dependent variable whereas Return on Asset (ROA), Capital Adequacy Ratio (CAR), Bank Size, GDP growth, and Inflation as independent/explanatory variables. The result of these studies indicated that ROA, Bank Size, GDP, and Inflation have a significant impact on NPL however CAR does now no longer have a significant impact on the NPL of banks. In other words, the GDP impact on NPL in this study indicates a positive and significant impact at the same time as maximum research display a negative impact. It implies that

the increase in GDP growth enables the significant growth of Nepalese banks even though there had been no significant changes in income increase. Therefore, GDP growth has a positive and significant impact on the NPL of commercial banks. Thus, the bankers and policymakers must take into account GDP growth cautiously at the time of taking NPL-associated decisions.

The review of the literature supports the validity of variables taken for the study i.e. NPA ratio, CAR and LQDT ratio as independent, and ROE and ROA as a dependent variables which has a significant relationship between the dependent and independent variables. Most of the results showed that there exists an inverse negative relationship between NPA and ROA & ROE, a positive relationship between LQDT and ROA & ROE, a positive relationship between CAR and ROA, and a negative relationship between CAR and ROE. Thus, there exists a significant relationship between most of the dependent and independent variables which need to be studied under the latest available data.

2.5 Research gap

Recent studies suggest that increasing non-performing assets is one of the major challenges faced by commercial banks in the present context. Some research has capital adequacy (CAR) as a measure of NPL while other has focused on internal and external factors affecting the non-performing assets. Similarly, some research was done relating to loan loss provisioning and its impact on bank performance in a foreign context but there is a paucity of similar studies in the context of the Nepalese banking sector. Some research has been conducted along with the variables like ROA, ROE, net NPA, gross NPA, liquidity ratio, gross domestic product, loan loss provision ratio, loan and advance to total deposit ratio. The studies so far provide conflicting evidence that fails to undertake the continuously changing central bank policy and national as well as international banking environment. The result obtained from the different research is providing different results. Thus, this study is conducted to measure profitability based on two variables i.e., return on assets and return on equity. Along with this, the study also focuses on the current state of non-performing assets through the latest data collection of the sampled commercial banks. The latest data of sampled commercial banks have been taken for the study using an econometric method to analyze the data collected.

Further, the research for the analysis of the impact of NPA on the profitability of commercial banks has not been conducted using the econometric method of data analysis in developing countries like Nepal. Also, the random sampling method of data collection is used where the research fails to evaluate the adequacy of sample size. So, to overcome this gap the study aims at evaluating the adequacy of sample size using the calculationtools developed by Daniel W.W in 1999.

Hence this study attempts to fill these research gaps by taking the reference of sampled commercial banks of Nepal which are selected in terms of capital, profit, and general market reach.

CHAPTER – III
RESEARCH METHODOLOGY

3.1 Research design

Research design is a planned structure and strategy of investigation conceived to obtain answers to research objectives through the analysis of data. The primary goal of the study is to examine the impact of non-performing assets of commercial banks in Nepal. This study is based on a descriptive study as well as an analytical research design. An extensive study of non-performing loans, their effect on different aspects of commercial banks, the factor responsible for them, and their scope and challenges has been carried out using secondary data. A descriptive approach has been used to describe the concept of non-performing assets and an analytical approach has been used to depict and analyze the current situation. The data and information collected from the secondary sources are rearranged, tabulated, analyzed, and interpreted accordingly to the need of the study for attaining the stated objectives and for necessary recommendations to the stakeholders.

3.2 Population and sample

The sample size of a survey is the total number of complete responses that were received during the survey process. It is referred to as a sample because it does not include the full target population; it represents a selection of that population (Daniel, 1999). Since the study is concerned with the impact of non-performing assets on the profitability of commercial banks in Nepal, all the licensed commercial banks that are operating currently are the population of the study. For this study, the random sampling technique is used where the adequacy of the sample from the total population was calculated by using the sampling calculator at a 95% confidence level developed by Daniel (1999) as follows;

$$n = \frac{[z^2 \times p \times (1 - p) / e^2]}{[1 + (z^2 \times p \times (1 - p) / (e^2 \times N))]}$$

$$n = \frac{[1.96^2 \times 0.99 \times (1 - 0.99) / 0.05^2]}{[1 + (1.96^2 \times 0.99 \times (1 - 0.99) / (0.05^2 \times 27))]}$$

$$n = \frac{15.2127}{1.5634} = 9.73$$

$$n \approx 10$$

Where,

n= Sample size of finite population

z = Confidence level (α) of 95%

p = Proportion population (expressed as a decimal)

N = Population size

e = Margin of error.

At present, there are 27 commercial banks in operating its activities in Nepal. Out of those 27 populations, 10 commercial banks are drawn in terms of profit, capital and general market reach, covering the period from 2011/12 to 2020/21 using random sample technique. The names of 27 commercial banks were kept into a single bowl and were drawn randomly as presented in the Table 4;

Table 4

List of sampled commercial banks

S.N.	Name of bank	Study period
1	Bank of Kathmandu Lumbini Ltd.	2011/12 to 2020/21
2	Everest Bank Ltd.	2011/12 to 2020/21
3	Himalayan Bank Ltd.	2011/12 to 2020/21
4	Machhapuchchhre Bank Ltd.	2011/12 to 2020/21
5	Nabil Bank Ltd.	2011/12 to 2020/21
6	Nepal Credit and Commerce Bank Ltd.	2011/12 to 2020/21
7	Nepal Investment Bank Ltd.	2011/12 to 2020/21
8	NIC Asia Bank Ltd.	2011/12 to 2020/21
9	Nepal SBI Bank Ltd	2011/12 to 2020/21
10	Siddhartha Bank Ltd.	2011/12 to 2020/21

3.3 Nature and source of data

The research is performed applying a quantitative method where panel data are used. The source of data is primary from where the past ten years of data of each selected commercial bank are used for the analysis. The main sources of secondary data collection for the study are as follows;

a. Annual reports of the selected commercial banks for non-performing assets ratio, ROA, ROE, liquidity ratio and interest rate spread

b. NRB monthly report for capital adequacy ratio
c. NRB website for loan loss provisioning ratio

3.4 Method of analysis

The data collected from various sources are in raw form so they need to be classified and tabulated as per the nature of the study and following the data. Thus, different financial and statistical tools are used for data analysis where the econometric method of analysis is used. Here, the financial analysis includes the ratio analysis of selected independent variables for the study such as non-Performing ratio, Liquidity ratio, Capital adequacy ratio, and Interest rate spread whereas the statistical tools include as listed below;

Arithmetic mean: The arithmetic mean is the average of the given observations. It is calculated by:

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

Where,

$\sum$ X = sum of the variable 'X'

N= No of observation

Standard deviation: Standard deviation is defined as the positive square root of the mean of the square of the deviation taken from the arithmetic mean. A higher standard deviation implies that there will be higher variability whereas a lower standard deviation implies lower variability. It can be calculated as:

$$\text{SD } (\sigma) = \sqrt{\left[\frac{\sum X^2}{N} - \left(\frac{\sum X}{N}\right)^2\right]}$$

Co-efficient of variation (CV): The ratio of standard deviation and mean is called the coefficient of variation. A higher CV indicates that there is a greater level of dispersion around the mean so a less CV is more uniform and consistent and vice versa. It is calculated as:

$$\text{(CV)} = \frac{\sigma}{X} \times 100$$

Correlation of co-efficient(r): Correlation coefficient is defined as the association between the dependent variable and independent variable. It is a method of determining

the relationship between these two variables. If the two variables are so related in the change in the value of the independent variable that causes the change in the value of the dependent variable, then it is said to have a correlation coefficient. It is calculated as:

Correlation of coefficient (r) $= \frac{n\Sigma xy - \Sigma x \Sigma y}{\sqrt{n\Sigma x^2 - (\Sigma x)^2} \times \sqrt{n\Sigma y^2 - (\Sigma y)^2}}$

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

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

If r < 0 there is negative relationship between the variable

If r > 0 there is positive relationship between the variable

If r = -1 the relationship is perfectly negative between the variable.

If r = +1 the relationship is perfectly positive between the variable

Regression analysis: Regression analysis is a statistical technique for estimating the relationship among variables. Since the study constitutes more than two independent variables, the multiple regression models with the expected sign of a negative relationship between dependent and independent variables are used. The multiple regression model is a flexible method of data analysis that may be appropriate whenever a qualitative variable (dependent or criterion) variable is to be examined in relationship to any other multiple factors (expressed as independent or predictor variable). The underlying model is:

$ROA = \beta_0 + \beta_1 NPA + \beta_2 LQDT + \beta_3 CAR + \beta_4 IRS + \mu$

$ROE = \beta_0 + \beta_1 NPA + \beta_2 LQDT + \beta_3 CAR + \beta_4 IRS + \mu$

Where:

ROA = Profitability measured using Return on Assets

ROE=Profitability measured using Return on Equity

NPA= Non-performing Assets Ratio

LQDT= Liquidity Ratio

CAR= Capital Adequacy Ratio

IRS= Interest rate spread

β_0 =Intercept

β_i= coefficient of i^{th}independent variable

μ = random error

The negative significant sign is the expectation from the regression analysis of dependent and independent variables i.e. ROA, ROE and NPA, CAR. Similarly, positive significant sign is the expectation from the regression analysis of dependent and independent variables ROA, ROE and LQDT, IRS.

3.5 Research framework and definition of variables

In this study, profitability measures namely ROA and ROE are considered the dependent variable whereas the Non-performing ratio, Liquidity ratio, Capital adequacy ratio, and Interest rate spread independent variable. The variable ROA and ROE are selected as dependent because they shows the financial performance of commercial banks in terms of profit where as from among the variables acknowledged from the brief literature review with respect to ROA and ROE, the variables which showed significant and influentialrelationship and thus are selected and related to the study and developed a framework as presented in Figure 1;

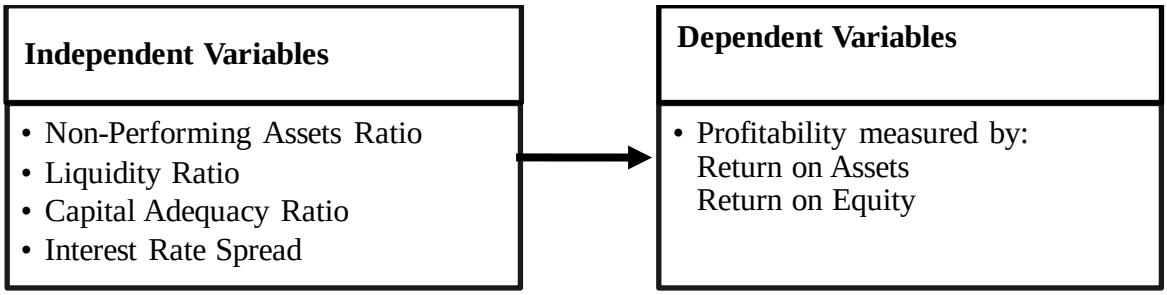

Figure 1

Theoretical framework

Independent variables

Non-performing assets ratio (NPA):

The ratio examines the non-performing assets out of the total loan advances portfolio. The greater ratio indicates that the bank loan is of bad quality in nature. Thus the commercial banks expect lower non-performing assets to loans and advances ratio. As per international standard, the standard NPR is 5% but in Nepal NPA is acceptable up to 10 %. This ratio can be calculated as follows:

$$\text{NPA ratio} = \frac{\text{Total Non -Performing Loan}}{\text{Total Loan \& Advances}}$$

Liquidity ratio (LQDT):

Liquidity ratios refers to the ability of a company'sto pay its debt obligations and its margin of safety through the calculation of metrics including the ratios like current ratio, quick ratio, and operating cash flow ratio. Under this study, the liquidity of a bank in terms of its reserve requirement is taken into consideration. It is the amount that the commercial banks have to maintain a certain amount of deposit as reserves with the NRB Thus, the percentage of cash required to be maintained in reserves with respect to the total deposit of bank, is called the Cash Reserve Ratio. This ratio can be calculated as follows:

$$\text{Liquidity ratio} = \frac{\text{Reserve requirement}}{\text{Total deposit}}$$

Capital adequacy ratio (CAR):

Capital adequacy ratio is the result of capital to the sum of risk-weighted assets of bank. The amount of bank's capital relative to the amount of its risk-weighted credit exposure is measured by this CAR ratio. The ratio measures the adequacy of capital required to bear the risk of its total risky assets. In the contest of this thesis, CAR is defined as the ration of shareholder's equity to total assets ratio.This ratio can be calculated as follows:

$$\text{Capital adequacy ratio} = \frac{\text{Total shareholder's equity}}{\text{Total Assets}}$$

Interest rate spread (ISR):

Interest rate spread is the result of difference from the rate of interest that the bank pays to its depositors and the rate of interest that it receives from the credit customers. So, higher the interest rate spread, higher will be the performance of banks in terms of its profitability since it is the major instrumental to a bank's profitability. The ISR is calculated as follows:

Interest rate spread = Interest income rate – Interest expenses rate

Dependent variables

Return on assets:

This ratio shows the degree of profitable of a company with relative to its total assets. It gives a manager, investor or an analyst an idea to how efficient a company's management

is at using its assets to generate earnings. Generally, it is calculated by net income divided by total assets. Net income is the income extracted from the income statement of the company which is also the profit after taxes. Similarly, assets are extracted from the balance sheet which contains cash and cash-equivalent items like as receivables, inventories, land, capital equipment as depreciated, along with the value of intellectualproperty. This ratio is calculated as follows:

$$\text{Return on Assets} = \frac{\text{Net income}}{\text{Total assets}}$$

Return on equity:

Return on equity is a measure of the profitability of a business in relation to the equity. Equity can be computed by deducting total assets with liabilities so return on equity is a measure of how well a company uses investment to generate earnings growth. In other words this ratio shows how much profit each rupee of common stockholders' equity generates. This is an important measurement for potential investors because they want to see how efficiently a company will use their money to generate net income. This ratio is calculated as follows:

$$\text{Return on Equity} = \frac{\text{Net income}}{\text{Shareholders equity}}$$

The appropriate selection of the research design along with the qualitative data from among the population selected through adequate sampling technique is the key element to draw the logical and effective conclusion. Thus, this section describes about the adequacy of sample size, nature and source of data and its methodology along with the theoretical relationship among the selected variables.

CHAPTER - IV
RESULTS AND DISCUSSION

This chapter is devoted to analyzing the structure and pattern of dependent variables i.e., return on assets and return on equity and various independent variables i.e. non-performing assets ratio, Liquidity ratio, capital adequacy ratio, and interest rate spread of sampled commercial banks for the period of FY 2011/2012 to 2020/21. In this chapter, the raw form of data that was collected from various sources is processed and changed into an understandable presentation using financial as well as statistical tools supported by diagrams and graphs as mentioned in the previous chapter plan. Similarly, the process of transforming data is undertaken for the examination and interpretation of such data to conclude. Therefore, this chapter is the heart of the study, as all the findings, conclusions, and implications are going to be derived from the calculations and analysis done in this section.

4.1 Analysis of non- performing assets ratio (NPA)

This ratio determines the proportion of non-performing assets in the total loan and advances portfolio. As per NRB directives, the loan falls under the category of substandard, doubtful, and loss are regarded as non-performing assets or loans. Hence, a lower ratio is preferable as per international standard only 5% NPAs is allowed but in the case of Nepal, a maximum of 10% NPAs is acceptable. Table 5, exhibits the ratio of non-performing assets to loans and advances of selected 10 commercial banks for 10 consecutive years where the NPA ratio of non-performing assets and total loans and advances has been tabulated in Table 5.

Table 5

Descriptive statistics of non-performing asset to total loans and advance ratio

Year/ Bank	BOK	EBL	HBL	MBL	NABIL	NCC	NIBL	NIC	NSBI	SBL
2011/12	2.30	0.84	2.09	2.84	1.77	3.82	3.32	0.60	0.54	1.52
2012/13	1.50	0.62	2.89	2.84	2.26	2.73	1.91	0.73	0.37	2.39
2013/14	1.06	0.97	1.96	1.78	2.13	2.80	1.77	2.32	0.26	2.75
2014/15	3.47	0.66	3.22	0.64	2.25	2.75	1.25	2.33	0.19	1.80
2015/16	2.51	0.38	1.23	0.55	1.14	1.93	0.68	2.07	0.14	1.47
2016/17	1.29	0.25	0.85	0.38	0.80	7.49	0.83	0.36	0.10	1.30
2017/18	3.04	0.20	1.40	0.44	0.55	3.87	1.36	0.06	0.20	1.09
2018/19	1.54	0.16	1.12	0.37	0.74	2.78	2.78	0.46	0.20	0.75
2019/20	2.28	0.22	1.01	0.52	0.98	2.86	2.91	0.75	0.23	1.38
2020/21	1.04	0.12	0.48	0.62	0.84	1.76	2.46	0.50	0.23	1.00
Mean	2.00	0.44	1.63	1.10	1.35	3.28	1.93	1.02	0.25	1.55
Std. Dev.	0.85	0.31	0.90	1.01	0.68	1.62	0.91	0.87	0.13	0.62
C.V	42.24	69.46	55.14	91.53	50.59	49.53	47.33	85.27	51.22	40.13
Min.	1.04	0.12	0.48	0.37	0.55	1.76	0.68	0.06	0.10	0.75
Max.	3.47	0.97	3.22	2.84	2.26	7.49	3.32	2.33	0.54	2.75

Source: Appendix 1

Table 5 reflects the non-performing assets to total loans and advance ratio of sampled commercial banks throughout the fiscal year 2011/12 to 2020/21. The NPA ratio of different commercial banks has been tabulated to analyze the level of NPA and understand the trend of loans that have remained due under the category of sub-standard, doubt-full, and loss. Throughout 10 years date, NIC has the minimum ratio of NPA i.e. 0.06% on 2017/18 whereas NCC has the highest i.e. 7.49% on 2016/17. From Table 5, NCC possesses the highest average value of non-performing assets to total loans and advance ratio i.e., 3.28%. This means that NCC bank, despite having greater deposit utilization, has the highest average value of loans turning bad. High non-performing asset to total loans and advances implies that a significant number of their loans have recovery issues. On the other hand, NSBI has 0.25% which is the lowest ratio, which means that its loans have a minimal record of turning bad.

Table 5 also signifies that NCC has the highest degree of deviation of 1.62%, whereas, NSBI and have the lowest of 0.13%. Similarly, MBL has the highest variation of 90.91% and SBL has the lowest at 40.13%. MBL seems to be having a problem in managing its

defaulters as an increase in the number of its loans and advances also increased its defaulters.

4.2 Trend analysis of industry average

The average of dependent variable i.e., return on assets, return on equity and independent variables i.e. non performing ratio, liquidity ratio, capital adequacy ratio and interest rate spread with respect to sampled commercial banks over the study period of 10 years could be studied in the following table. Along with the tabular presentation of bank average data, the statistical analysis and interpretation has been done to draw the information about the bank average variables over the respective years with in the study period.

Table 6

Variable wise industry average ratios

Year	Avg. ROA	Avg. ROE	Avg. NPA	Avg. LQDT	Avg. CAR	Avg. IRS
2011/12	1.22	12.95	1.96	11.54	9.04	3.45
2012/13	1.32	13.95	1.82	14.47	9.30	4.06
2013/14	1.77	19.14	1.78	12.68	9.40	4.38
2014/15	1.77	18.39	1.86	13.71	9.06	4.42
2015/16	1.76	17.82	1.21	14.48	9.11	4.11
2016/17	1.68	22.05	1.37	10.20	7.55	4.18
2017/18	1.48	20.81	1.22	14.07	6.87	4.08
2018/19	1.66	23.87	1.09	14.27	7.17	4.58
2019/20	1.83	24.09	1.31	13.12	7.16	4.54
2020/21	1.56	21.31	0.91	13.81	7.26	4.21
Mean	1.61	19.44	1.45	13.24	8.19	4.20
Std. Dev.	0.21	3.79	0.37	1.41	1.06	0.32
C.V	12.90	19.51	25.46	10.63	12.95	7.71
Min.	1.22	12.95	0.91	10.20	6.87	3.45
Max.	1.83	24.09	1.96	14.48	9.40	4.58

Table 6 reflects the bank average return on assets ratio, return on equity ratio, non-performing assets ratio, liquidity ratio, capital adequacy ratio, and interest rate spread of sampled commercial banks throughout the fiscal year 2011/12 to 2020/21. The table

shows that the mean bank average ROA is 1.61% and ROE is 19.44% with its independent variables of NPA 1.45%, LQDT 13.24%, CAR 8.19%, and IRS 4.20%. The highest average return on assets and return on equity are 1.83% and 24.09% respectively along with an NPA of 1.96% which means the fiscal year 2019/20 is the most efficient bank in generating earnings using its assets and total capital than another fiscal year. On the other hand, FY 2011/12 had both the lowest return on assets and returns on equity i.e., 1.22% and 12.95% implying that its assets and capital utilization are not as efficient as the other fiscal year within the study period. There is the lowest deviation of data in ROA with 0.21% whereas highest in ROE i.e., 3.79% but the highest variation is found in NPA with 25.46% and lowest in IRS i.e., 7.71%.The trend of NPA and ROA can be presented in Figure 2;

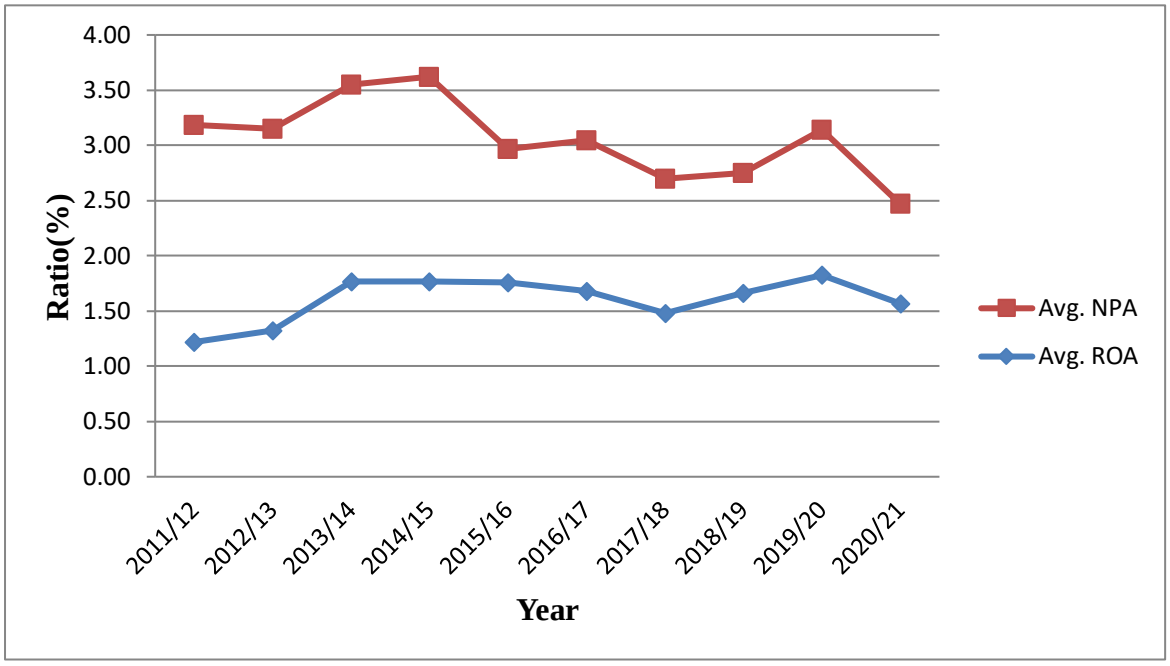

Figure 2

Trend analysis between NPA and ROA

Figure 2 shows the average NPA and ROA were 1.96% and 1.22% in 2011/12. The trend of NPA in commercial banks was in decreasing trend i.e., it decreased from 1.96% to 1.78% in the year 2013/14 and increased to 1.86% in the year 2014/15 and gradually started to decrease to 0.91% in the fiscal year 2020/21. The highest average NPA during the study period is noted up to 1.96% in 2011/12 and the lowest to 0.91% in the year 2020/21. Figure 2 also shows that ROA was also in fluctuating trend concerning NPA. Here, the average ROA increased from 1.22% in 2011/12 to 1.48% in 2017/18, decreased

to 1.42% in 2014/15, and again started to increase from 1.66% in 2018/19 to 1.83% in 2019/20. But in the fiscal year 2020/21 it decreased to 1.56%. Thus, it concludes that there is a fluctuation in NPA and ROA of commercial banks in Nepal negatively in sample years.

The trend of NPA and ROE is presented in Figure 3

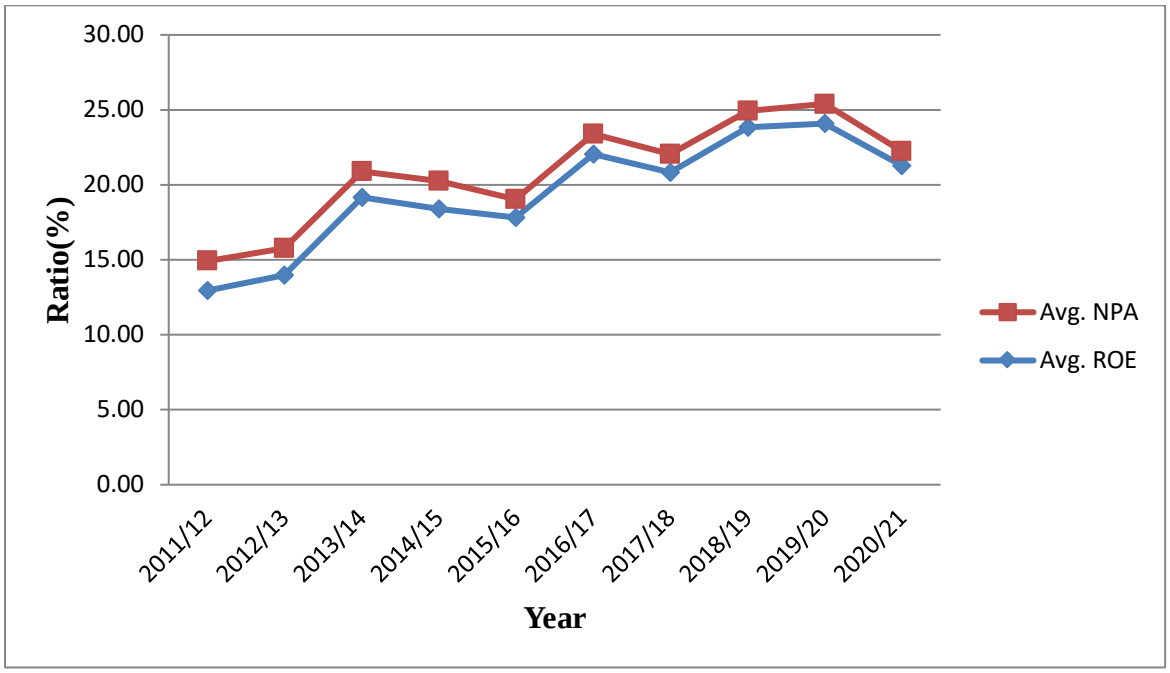

Figure 3

Trend analysis between NPA and ROE

Figure 3 shows the NPA and ROE were 1.96% and 12.95% in 2011/12. The trend of NPA in commercial banks was in decreasing trend but in the year 2014/15 it increased to 1.86% and started to decrease reaching 0.91% in 2020/21. The lowest NPA was 0.91% in 2020/21 whereas the highest NPA was in 2011/12 is 1.96%. Figure 4 also shows ROE was also in fluctuating trend concerning NPA. Here, the average ROE increases from 12.95% in 2011/12 to 19.14% in 2013/14, decreased to 17.82% in 2015/16, and again increased to 24.09% in 2019/20. But in the fiscal year 2020/21, it decreased to 21.31%. Thus, it concludes that there is fluctuation in NPA and ROE of commercial banks in Nepal within sample years.

4.3 Analysis of bank wise average ratio

The yearly average of dependent variables i.e., return on assets, return on equity, and independent variables i.e., nonperforming ratio, liquidity ratio, capital adequacy ratio, and interest rate spread of sampled commercial banks over the study period of 10 years are shown in the below table. Along with the tabular presentation of yearly average data, the statistical analysis and interpretation have been done to draw the information about the different variables over the study average with a yearly average data in Table 7.

Table 7

Bank wise average ratios

Bank	Avg. ROA	Avg. ROE	Avg. NPA	Avg. LQDT	Avg. CAR	Avg. IRS
BOK	1.38	16.32	2.00	8.40	9.44	4.22
EBL	1.85	24.02	0.44	17.56	7.06	4.65
HBL	1.72	21.66	1.63	17.13	8.20	4.30
MBL	1.16	13.57	1.10	17.97	8.27	4.53
NABIL	2.38	27.87	1.35	8.99	8.35	4.30
NCC	1.30	15.13	3.28	8.98	9.10	3.89
NIBL	1.92	20.32	1.93	10.53	9.57	4.58
NIC	1.44	17.88	1.02	26.35	6.96	3.77
NSBI	1.44	18.37	0.25	8.30	7.88	3.75
SBL	1.46	19.22	1.55	8.15	7.09	4.01
Mean	1.61	19.44	1.46	13.24	8.19	4.20
Std. Dev.	0.36	4.27	0.86	6.19	0.97	0.33
C.V	22.68	21.97	59.31	46.80	11.80	7.93
Min.	1.16	13.57	0.25	8.15	6.96	3.75
Max.	2.38	27.87	3.28	26.35	9.57	4.65

Table 7 reflects the yearly average return on assets ratio, return on equity ratio, non-performing assets ratio, liquidity ratio, capital adequacy ratio, and interest spread rate of the sampled commercial bank throughout the fiscal year 2011/12 to 2020/21. The table shows that the average ROA of sampled commercial is 1.61% with the highest of NABIL i.e. 2.38% and the lowest of MBL i.e.1.16%. Similarly, the average ROE of a sampled commercial bank is 19.44% with the highest of NABIL i.e. 27.87%, and the lowest of MBL i.e. 13.57%. On the other hand, the Yearly average NPA of a sampled commercial

bank is 1.46%, LQDT is 13.24%, CAR is 8.19% and IRS is 4.20%. Over the study period, NCC had the highest NPA of 3.28% which means there is a problem with loan recovery since a large amount of lending has become unrecovered. And, NSBI had the lowest NPA of 0.25% which means NSBI is the most efficient bank in generating earnings using its assets and total capital and managing its debt than other banks.

The data shows that there is a fluctuation in NPA by 59.31% and returns in terms of ROA and ROE are 22.68% and 21.97% respectively. This indicates that there exists a relationship among NPA, ROA, and ROE along with its controlling variables i.e., LQDT, CAR, and IRS.

4.4 Pair-wise correlation analysis

The Pearson Correlation Coefficients of independent variables i.e., NPA, LQDT, CAR and IRS associated with dependent variable ROA and ROE have been computed and the results are presented in Table 8 and 9 respectively. Correlation is a term that refers to the strength of a relationship between two variables. It measures how a unit increment in independent variables affect the dependent variable is measured by this correlation. A strong, or high, correlation means that two or more variables have a strong relationship with each other while a weak, or low, correlation means that the variables are hardly related. Correlation coefficients can range from -1.00 to +1.00. The value of -1.00 represents a prefect negative correlation while a value of +1.00 represents a perfect positive correlation. A value of 0.00 means that there is no relationship between the variables tested.

Table 8

Correlation matrix of variables associated with return on assets

Variables	ROA	NPA	LQDT	CAR	IRS
ROA	1.000				
NPA	-0.193*	1.000			
LQDT	0.061	-0.273**	1.000		
CAR	-0.042	0.122	-0.213**	1.000	
IRS	0.458**	0.078	-0.010	-0.061	1.000

*** p<0.05, * p<0.1*

The correlation coefficient of return on assets and non-performing asset ratio is -0.193 and is significant at 10 percentage confidence level, which means there is negative correlation between return on assets and non-performing ratio i.e., non-performing asset to total loan and advance ratio. This implies that as the non-performing assets increases the return on assets decreases. The number of non-performing assets reduces the interest income of the commercial banks and in result decrease the net income, hence reducing the return on assets.

The correlation coefficient of return on assets and liquidity ratio is 0.061, which means there is positive correlation between return on assets and liquidity ratio. This implies that an increase in LQDT ratio increases the return on assets of commercial banks during the study period. Theoretically, also an increase in loans and advances to customer increases the interest income and profitability. Being said that, the return on assets have increased throughout the study years on absolute terms.

The correlation coefficient of return on assets and capital adequacy ratio is -0.042, which means there is negative correlation between return on assets and CAR i.e. shareholder's equity to total assets ratio. This implies that as the capital adequacy ratio of commercial bank increases the return on assets decreases. The increase in the CAR ratio creates a situation of unutilized fund for the investments and lending thus reducing the returns of banks.

The correlation coefficient of return in assets and interest rate spread is 0.458 and is significant at 5 percentage confidence level, which means that there exists positive relationship between rate of interest spread and ROA. This implies that as the rate of interest spread increase, the return on assets of commercial bank also increases. Theoretically also the increase in the rate of interest expenses over interest income increases the returns of commercial banks and vice versa.

Table 9

Correlation matrix of variables associated with return on equity

Variables	ROE	NPA	LQDT	CAR	IRS
ROE	1.000				
NPA	-0.110	1.000			
LQDT	0.054	-0.273**	1.000		
CAR	-0.514**	0.122	-0.213**	1.000	
IRS	0.492**	0.078	-0.010	-0.061	1.000

*** p<0.05, * p<0.1*

The correlation coefficient of return on equity and a non-performing asset to total loan and advance ratio i.e., NPA ratio is -0.110, which means there is a negative correlation between return on equity and a non-performing asset to total loan and advance ratio. This implies that an increase in the level of non-performing assets of the commercial banks leads to a decrease in return towards the shareholders and vice versa.

The correlation coefficient of return on equity and liquidity ratio is 0.054, which means there is a positive correlation between return on equity and liquidity ratio. This implies that an increase in the LQDT ratio increases the return on equity of commercial banks. Similar to the effect on return on assets, the increase in the liquidity ratio increases the degree of cash convertibility for the profitable investments whenever requires thus increasing the return on equity and vice versa.

The correlation coefficient of return on equity and capital adequacy ratio is -0.514 and is significant at 5 percentage confidence level, which means there is a negative correlation between return on equity and CAR i.e., shareholder's equity to total assets ratio. This implies that as the capital adequacy ratio of commercial banks increases the return on equity decreases. The decrease in the CAR ratio creates a situation of an increase in unutilized capital which is not used for the revenue-generating activities and thus reduces the return of equity of banks.

The correlation coefficient of return in equity and interest rate spread is 0.492 and is significant at 5 percentage confidence level, which means that there exists a positive relationship between the rate of interest spread and ROE. This implies that as the rate of

interest spread increases, the return on equity of commercial banks also increases. Theoretically also the increase in the rate of interest expenses over interest income increases the returns of commercial banks and vice versa.

4.5 Regression analysis with dependent variable ROA

To test the statistical significance and robustness of the results, the multiple regression analysis concerning the econometric method has been carried out. It deals with regression results from various specifications of the model to examine the estimated relationship of different bank-specific performance indicators with the profitability of selected commercial banks during the period through FY 2011/12 to 2020/21. The two models of regression analysis are the major concern of this study which has been favored based on the result of the Hausman 1978 specification test.

4.5.1 Regression of fixed effect model

The fixed effect model is one of the statistical models where the values of independent variables are assumed to be constant and there change independent variables only due to the change in the value of independent variables other things remain the same. The below table shows the regression results of independent variables i.e., NPA, LQDT, CAR, and IRS with dependent variable ROA under the fixed effect model;

Table 10

Regression result on ROA under fixed effect model

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf.	Interval]	Sig
NPA	-.136	.04	-3.37	.001	-.216	-.056	***
LQDT	.019	.006	2.96	.004	.006	.032	***
CAR	-.009	.021	-0.40	.687	-.051	.034	
IRS	.406	.06	6.72	0	.286	.526	***
Constant	-.084	.351	-0.24	.812	-.781	.614	

Mean dep. Var.	1.604	SD dep.Var.	0.524
R-squared	0.421	Number of obs	100
F-test	15.645	Prob> F	0.000
Akaikecrit. (AIC)	51.183	Bayesian crit. (BIC)	64.209

**** p<.01, ** p<.05, * p<.1*

Table 10 shows the result of regression analysis of ROA with different independent variables defined for the study. The result shows ROA possesses a significant negative relationship with NPA, a significant positive relationship with LQDT, and IRS with a negative insignificant relationship with CAR. The value of R-square is greater than 0 i.e., 0.421 and the value of probability in F- statistic is 0% which means the model has high explanatory power and is fitted at a 5% level of significance.

4.5.2 Regression of random effect model

The random effect model is one of the statistical models where the effect that defines systematic components shows different forms of random variation. In another word, this is the model which helps to provide an efficient result by nullifying the correlation among the unobserved heterogeneity variables. The below table shows the regression results of independent variables i.e., NPA, LQDT, CAR, and IRS with dependent variable ROA under the random effect model;

Table 11

Regression Result on ROA under random effect model

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
NPA	-.131	.039	-3.36	.001	-.207	-.054	***
LQDT	.017	.006	2.71	.007	.005	.029	***
CAR	-.006	.021	-0.29	.768	-.047	.035	
IRS	.404	.059	6.82	0	.288	.52	***
Constant	-.073	.367	-0.20	.842	-.792	.646	

Mean dep.var	1.604	SD dep.Var	0.524
Overall r-squared	0.215	Number of obs	100
Chi-square	62.725	Prob> chi2	0.000
R-squared within	0.420	R-squared between	0.050

**** p<.01, ** p<.05, * p<.1*

Table 11 shows the result of regression analysis of ROA with different independent variables defined for the study. The result shows ROA possesses a significant negative relationship with NPA, a significant positive relationship with LQDT, and IRS with a negative insignificant relationship with CAR. The value of R-square is greater than 0 i.e., 0.215 and the value of probability in F- statistic is 0% which means the model has high explanatory power and is fitted at a 5% level of significance.

4.5.3 Selection of model using Hausman test

Hausman test developed in 1978 is the test that helps to find the econometric model misspecification that exists among the variables between two different models i.e., fixed effect and random effect. So, this test helps to choose the appropriate econometric model for the regression analysis of the variables. The decision shall be drawn based on null hypothesis which is as follow;

H0: There is no significant difference in the results of random effect model and fixed effect model.

Table 12

Hausman specification test for selection between fixed and random effect model

ROA	(b) Fixed Effect	(B) Random Effect	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E
NPA	-0.136	-0.131	-0.005	0.011
LQDT	0.019	0.167	0.002	0.002
CAR	-0.008	-0.006	-0.002	0.004
IRS	0.406	0.404	0.002	0.012
Chi square	1.92	P-value	0.75	

Here, the P-value from Hausman test is 0.75 which is greater than 0.05 that means the null hypothesis is accepted and implies that random effect model for the regression analysis is appropriate since there exist unobserved heterogeneous effects of variables.

4.5.4 Analysis of panel regression for ROA

The regression of the independent variables with dependent variable ROA is carried out to study the realationship among them using the balanced panel data of the sampled commercial banks. The test of signifncance along with the degree of influence on dependent variable ROA is shown in the Table 13.

Table 13

Regression analysis on return on assets

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
NPA	-.131	.039	-3.36	.001	-.207	-.054	***
LQDT	.017	.006	2.71	.007	.005	.029	***
CAR	-.006	.021	-0.29	.768	-.047	.035	
IRS	.404	.059	6.82	0	.288	.52	***
Constant	-.073	.367	-0.20	.842	-.792	.646	

Mean dep.var	1.604	SD dep. Var	0.524
Overall r-squared	0.215	Number of obs	100
Chi-square	62.725	Prob> chi2	0.000
R-squared within	0.420	R-squared between	0.055

**** p<.01, ** p<.05, * p<.1*

Based on the result of Table 13 the following equation has been derived:

ROA = –0.073 – 0.131NPA +0.017LQDT – 0.006CAR+ 0.404IRS + e

Table 13 presents regression results when ROA is regressed on the non-performing assets ratio, liquidity ratio, capital adequacy ratio, and interest rate spread. The results show that there exists a statistically negative significant relationship between ROA and NPA since the P-value i.e. 0.001 is less than 0.05 at a 95% confidence level. The regression coefficient of a non-performing asset to total loan and advance (NPA) ratio in regression coefficient analysis is -0.131, which indicates if we increase the non-performing asset to total loan and advance ratio by 1 unit, the average influence on return on assets decreases by 0.131 units. Hence there is a negative relationship however the relationship is significant.

There exists a positive significant relationship between ROA and LQDT ratio as the P-value i.e. 0.007 is greater than 0.05 at a 95% confidence level. The regression coefficient of liquidity ratio in regression coefficient analysis is 0.017, which indicates if we increase the liquidity ratio by 1 unit, the average influence on return on assets also increases by 0.017 units. Hence there is a positive significant relationship between ROA and LQDT.

The regression coefficient of capital adequacy ratio in the regression coefficient analysis is -0.006, which indicates if we increase shareholder's equity to total assets ratio by 1 unit,

the average influence on return on assets decreases by 0.006 units. Also, the P-value i.e., 0.768 is greater than 0.05 at a 95% confidence level which implies there exists an insignificant relationship between ROA and CAR. Hence there is a negative relationship however the relationship is insignificant.

The regression coefficient of interest rate spread in the regression coefficient analysis is -0.404, which indicates if we increase the interest rate spread by 1 unit, the average influence on return on assets increases by 0.404 units. Also, the P-value i.e., 0 is greater than 0.05 at a 95% confidence level which implies there exists a significant relationship between ROA and IRS. Hence there is a positive significant relationship.

4.6 Regression analysis with dependent variable ROE

The multiple regression analysis concerning the econometric method has been carried out to test the significance and robustness of the results. The model for the regression analysis of dependent and independent variables could be selected based on the result of the Hausman 1978 specification test that has been explained.

4.6.1 Regression of fixed effect model

The fixed effect model is one of the statistical models where the values of independent variables are assumed to be constant and there change independent variables only due to the change in the value of independent variables other things remain the same. Table 14 shows the regression results of independent variables i.e., NPA, LQDT, CAR, and IRS with the dependent variable ROE under fixed-effect model.

Table 14

Regression result of ROE under fixed effect model

ROE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
NPA	-1.128	.486	-2.32	.023	-2.095	-.162	**
LQDT	.173	.077	2.24	.028	.019	.327	**
CAR	-2.273	.257	-8.84	0	-2.784	-1.762	***
IRS	5.722	.728	7.86	0	4.275	7.168	***
Constant	13.371	4.229	3.16	.002	4.964	21.778	***

Mean dependent var	19.437	SD dependent var	7.415
R-squared	0.662	Number of obs	100
F-test	42.153	Prob> F	0.000
Akaike crit. (AIC)	549.072	Bayesian crit. (BIC)	562.098

*** p<.01, ** p<.05, * p<.1*

Table 14 shows the result of regression analysis of ROE with different independent variables defined for the study. The result shows ROE possess significant negative relationship with NPA and CAR and significant positive relationship with LQDT and IRS. The value of R-square greater than 0 i.e. 0.662 and value of probability in F- statistic is 0% which means the model has high explanatory power and is fit at 5% level of significant.

4.6.2 Regression of random effect model

The random effect model is one of the statistical models where the effect that defines systematic component shows different forms of random variation. In other word this is the model which helps to provide efficient result by nullifying the correlation among the unobserved heterogeneity variables. The below table shows the regression results of independent variables i.e., NPA, LQDT, CAR and IRS with dependent variable ROE under random effect model;

Table 15

Regression result of ROE under random effect model

ROE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
NPA	-1.044	.469	-2.23	.026	-1.962	-.126	**
LQDT	.138	.074	1.86	.063	-.007	.284	*
CAR	-2.228	.252	-8.84	0	-2.722	-1.734	***
IRS	5.686	.716	7.95	0	4.284	7.089	***
Constant	13.493	4.395	3.07	.002	4.879	22.108	***

Mean dependent var	19.437	SD dependent var	7.415
Overall R^2	0.445	Number of obs.	100
Chi-square	168.590	Prob> chi2	0.000
R^2within	0.661	R-squared between	0.123

*** p<.01, ** p<.05, * p<.1*

Table 15 shows the result of regression analysis of ROE with different independent variables defined for the study. The result shows ROE possess significant negative relationship with NPA, insignificant positive relationship with LQDT, negative significant relationship with CAR and positive significant relationship with IRS. The value of R-square greater than 0 i.e. 0.445 and value of probability in F- statistic is 0% which means the model has high explanatory power and is fit at 5% level of significant.

4.6.3 Selection of model using Hausman test

Hausman test developed in 1978 is the test that helps finding the econometric model misspecification that exists among the variables between two different models i.e. fixed effect and random effect. So, this test helps to choose the appropriate econometric model for the regression analysis of the variables. The decision shall be drawn on the basis of null hypothesis as in Table 16;

H0: There is no significant difference in the results of random effect model and fixed effect model.

Table 16

Hausman specification test for selection between sixed and random effect model

ROE	(b) Fixed Effect	(B) Random Effect	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E
NPA	-1.129	-1.044	-0.842	0.130
LQDT	0.173	0.138	0.035	0.022
CAR	-2.272	-2.228	-0.045	0.050
IRS	5.721	5.686	0.354	0.131
Chi square	3.09	P-value	0.54	

Here, the P-value from Hausman test is 0.5425 which is greater than 0.05 that means the null hypothesis accepted and implies that random effect model for the regression analysis is appropriate for analysis of data.

4.6.4 Analysis of panel regression for ROE

The regression of the independent variables with dependent variable ROE is carried out to study the realationship among them using the balanced panel data of the sampled

commercial banks. The test of signifncance along with the degree of influence on dependent variable ROE is shown in the Table 17;

Table 17

Regression result on return on equity

ROE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
NPA	-1.044	.469	-2.23	.026	-1.962	-.126	**
LQDT	.138	.074	1.86	.063	-.007	.284	*
CAR	-2.228	.252	-8.84	0	-2.722	-1.734	***
IRS	5.686	.716	7.95	0	4.284	7.089	***
Constant	13.493	4.395	3.07	.002	4.879	22.108	***

Mean dependent var	19.437	SD dependent var	7.415
Overall r-squared	0.445	Number of obs	100
Chi-square	168.590	Prob> chi2	0.000
R-squared within	0.661	R-squared between	0.123

**** p<.01, ** p<.05, * p<.1*

Based on the results of Table 17 the following equation has been derived:

ROE = 13.493– 1.044NPA + 0.138LQDT – 2.228CAR+ 5.686IRS + e

Table 17 presents regression results when ROE is regressed on the non-performing assets ratio, liquidity ratio, capital adequacy ratio, and interest rate spread. The results show that there exists a statistically significant relationship between ROE and NPA since the P-value i.e. 0.026 is greater than 0.05 at a 95% confidence level. The regression coefficient of a non-performing asset to total loan and advance (NPA) ratio in regression coefficient analysis is -1.044, which indicates if we increase the non-performing asset to total loan and advance ratio by 1 unit, the average influence on return on equity also decreases by 1.044 units. Hence there is a negative significant relationship between ROE and NPA.

There exists a positive insignificant relationship between ROE and LQDT ratio as the P-value i.e. 0.063 is greater than 0.05 at a 95% confidence level. The regression coefficient of liquidity ratio in regression coefficient analysis is 0.138, which indicates if we increase

the liquidity ratio by 1 unit, the average influence on return on equity also increases by 0.138 units. Hence there is a positive insignificant relationship between ROE and LQDT.

The regression coefficient of capital adequacy ratio in the above regression coefficient analysis is -2.228, which indicates if we increase shareholder's equity to total assets ratio by 1 unit, the average influence on return on equity decreases by 2.228 units. Also, the P-value i.e., 0 is greater than 0.05 at a 95% confidence level stating the significant relationship between ROE and CAR. Hence there is a negative significant relationship between ROE and CAR.

The regression coefficient of interest rate spread in the regression coefficient analysis is 5.686 which indicate if we increase the interest rate spread by 1 unit, the average influence on return on assets also increases by 5.686 units. Also, the P-value i.e., 0 is greater than 0.05 at a 95% confidence level which implies there exists a significant relationship between ROE and IRS. Hence there is a positive significant relationship between ROE and IRS.

4.7 Result of hypothesis

The regression analysis of independent variables concerning its dependent variables has been done based on which leads toward the conclusion and implications of the study shall be drawn. The interpretation of the findings concerning the hypothesis set in the previous chapter is necessary to discuss the consistency of findings along with the comparison of the results of other researchers.

Table 18 shows the summary result of hypothesis testing.

Table 18:

Summary of results of hypothesis testing

Null hypothesis	P-value	Remarks
Ho_1: There is no significant relationship between non-performing assets and return on assets.	0.001	Rejected
Ho_2: There is no significant relationship between the non-performing assets and return on equity.	0.026	Rejected

Ho_3: There is no significant relationship between liquidity ratios and return on assets.	0.007	Rejected
Ho_4: There is no significant relationship between liquidity ratios and return on equity.	0.063	Accepted
Ho_5: There is no significant relationship between capital adequacy ratio and return on assets.	0.768	Accepted
Ho_6: There is no significant relationship between capital adequacy ratio and return on equity.	0	Rejected
Ho7: There is no significant relationship between interest rate spread and return on assets.	0	Rejected
Ho8: There is no significant relationship between interest rate and return on equity.	0	Rejected

Table 18 shows the result of hypothesis testing concerning the P-value calculated through the regression analysis using an econometric model. The null hypothesis Ho1, Ho2, Ho3, Ho6, Ho7, and Ho8 is rejected as the P-value is less than 5% and states that there exist significant relationships between the variables. Similarly, the null hypothesis Ho4 and Ho5 is accepted since the P-value is greater than 5% and implies that there exist insignificant relationships between the variables.

4.8 Discussion

The analysis of the impact of non-performing assets along with other controlling variables such as liquidity ratio, capital adequacy ratio, and interest rate spread on return on assets and return on equity were carried out in the study. Using the econometric method of regression analysis using the Hausman test, the best fit model from between the fixed effect and the random effect was selected and a certain conclusion has been drawn. Referring to different reviews of articles and journalsby different scholars, the pre-arrival framework regarding the relationship between dependent and independent variables has been developed. The studies of Wadhwa and Ramaswamy (2020), Arasu et al. (2019), Manu and Maheshwari (2018) and Pokharel (2020) found a negative significant relationship between NPA and ROA. Similarly, Poudel (2018), Gnawali (2018), Hersugondo et al. (2021) and Ahmed and Tripati (2017) found a negative significant relationship between NPA and ROE in the study along with different controlling variables

like liquidity ratio, capital adequacy ratio, interest rate spread, GDP, bank size and inflation.

In return of the encounter stage over pre-arrival through literature reviews of the research after the regression analysis of the variables, different results are drawn. The study showed that there exists a negative significant relationship between NPA and ROA, ROE. Theoretically, the default in the loan or the increase in non-performing loans reduces the interest income of the bank as result the performance measured by ROA and ROE tends to decrease. Similarly, there exists a positive significant relationship between liquidity ratio and ROA and a positive insignificant relationship with ROE. It is because the increase in liquidity increases the capacity of banks for profitable investments, lending and eventually increases the returns. Likewise, the capital adequacy ratio has a negative insignificant relationship with ROA and a negative significant relationship with ROE. It is because the increase in capital adequacy ratio states that there is not the optimum utilization of capital to generate profitable returns as result reduces the ROA and ROE of commercial banks. And, the interest rate spread has a positive significant relationship with both ROA and ROE because the interest rate spread is the indicator of interest income that increases the returns of commercial banks.

Thus, the relationship of the variables exists where they play a great role in indicating their degree of significance along with their impact on the determination of the performance of commercial banks. In the context of Nepal, the variation of the result concerning the literature review has been drawn due to the difference in the sampled bank, its size, country of study, and period of the study. Further, difference in the methods and models of data analysis adopted for the study is creating differences in the results. Thus, considering the consistency and contradictory results with respect to the international studies, the conclusions of the study are drawn.

CHAPTER - V
SUMMARY AND CONCLUSION

5.1 Summary

The study is concerned with the impact of non-performing assets on the profitability of Nepalese commercial banks. In addition to that, a general understanding of the state of non-performing assets among the sampled commercial banks has been made by reviewing different articles, NRB websites, and banks' annual reports for accurate data collection to substantiate the findings of secondary data. This chapter includes a summary, conclusion, and implications of the study. All summaries and conclusions are made according to the result obtained from the analysis.

To find out the impact of non-performing assets, four major ratios are considered as the independent variables which are the non-performing assets ratio, liquidity ratio, capital adequacy ratio, and interest rate spread. The main objective of the study is to find out the impact of non-performing assets on the profitability of commercial banks concerning ROA and ROE in Nepal. However, the study also covers specific objectives like analysing the non-performing assets of the sampled banks, examining the impact of NPA on ROA, examining the impact of NPA on ROE, analysing the impact of capital adequacy, liquidity ratio, and interest rate spread on ROA and ROE of Nepalese commercial banks.

Wadhwa and Ramaswamy (2020) argue that non-performing loans have a deleterious impact on bank profits as they decrease interest income and effects current profits and capital base as provisions need to be maintained. There is a significant positive relationship between Gross NPA and Net NPA there is a significant negative relationship between NPA with Return on Assets (ROA) of public & private sector banks (Arasu et al., 2019). Non-performing loans are considered determinants of profitability because high levels of non-performing loans adversely affect bank net profit through provisioning for doubtful debts and write-offs of bad debts; which normally affect profitability and capital levels (Patwary&Tasneem, 2019). Kingu et al. (2018) state there exist negative and statistically significant as the ratio of loan to deposit increases, the ROA of bank decreases, and Positive and statistically significant with ROA as the ratio of CAR

increases, the ROA of banks moves upward. There exists a negative relationship between CAR and ROE as Capital strength measured by the ratio of equity over total assets bears a negative influence on ROE (Shingjergji&Hyseni, 2015). Musah et al. (2018) state there is a positive relationship between interest rate spread and bank profitability i.e., ROA & ROE and is all statistically significant.

Pokharel (2020) argues that ROA, Bank Size, GDP, and Inflation have a significant impact on NPL however CAR does not have a significant impact on the NPL of banks. The net interest margin has positive and bank size has a negative significant relationship with the non-performing loan (Panta, 2018). Gnawali (2018) states that there exists a negative relationship between NPL and profit i.e., ROA and ROE whereas a positive relationship between CAR, LQDT, loan loss provision, and profits i.e., ROA and ROE.

The study is based on an analysis of both primary and secondary data of 10 commercial banks for the period of FY 2011/12 to 2020/21. The secondary data and information are collected from the annual reports of the respective individual bank, Nepal Rastra Bank and Financial Statistics and quarterly reports of respective banks. This study hypothesizes that there is no significant relationship between variables such as NPA ratio, liquidity ratio, capital adequacy ratio, and interest rate spread with the profitability measured in terms of return on assets and return on equity. The analysis of balanced panel data is carried out using a wide variety of statistical tools like structure and pattern of variables, descriptive statistics using trend analysis, correlation analysis, and regression analysis using the econometric method. The use of the random effect model has been favoured over the fixed effect model using the Hausman test since the unobserved heterogeneity exists among the variables. The major findings of the study are:

- NCC bank has the highest value of non-performing assets to total loans and advances ratio i.e., 7.49 in FY 2016/17. Since NCC bank is providing the maximum proportion of loans, their non-performing ratio is also the highest among the sampled banks. However, NIC bank has the lowest ratio i.e., 0.06 in FY 2017/18 which means that its loans have a minimal record of turning bad.

- As per the industry average analysis, the average non-performing assets ratio of selected banks during the study period is noticed to be a maximum of 1.96 in FY2011/12 and a minimum in FY 2020/21. The average liquidity ratio is found to

be a maximum of 14.48 in FY 2015/16 and a minimum of 10.20 in FY 2016/17. Similarly, the average capital adequacy ratio reached a maximum of 9.40 in FY 2013/14 and a minimum of 6.87 in FY 2017/18. The average interest rate spread is found to be a maximum of 4.58 in FY 2018/19 and a minimum of 3.45 in FY 2011/12. Whereas the average ROA and ROE are found to be a maximum of 1.83 and 24.09 in FY 2019/20 and a minimum of 1.22 and 12.95 in FY 2011/12 respectively.

- NIC bank possesses the highest average value of liquidity ratio i.e., 26.35 On the other hand, Siddhartha bank has the lowest average liquidity ratio i.e. 8.15, implying that its fund or deposit utilization is relatively poor.

- Nepal investment bank possesses the highest average value of capital adequacy ratio i.e., 9.57 which means that it has a high capacity of the capital required to meet its bank's risk-weighted credit exposure. Whereas, NIC has the lowest average ratio i.e., 6.96.

- Everest bank has the highest average ratio of interest rate spread i.e., 4.65 which implies it has the highest margin in the interest rate since it is receiving a high rate of return on lending over interest expenses. On the other hand, Nepal SBI bank has the lowest average ratio of 3.75.

- Nabil bank has the highest average return on asset ratio i.e., 2.38 which means that it has been most successful in generating a return from its assets. Machhapuchhre bank, on the other hand, has the lowest average return on assets ratio of 1.16 implying that the utilization of its assets is not as efficient as the other sampled banks.

- Nabil bank has the highest average return on equity ratio of 27.87 meaning that it has been well efficient in terms of generating revenue by utilizing the shareholder's fund. However, Machhapuchhre bank has the lowest average return on equity ratio i.e., 13.57 implying that its utilization of shareholders fund is not as efficient as the other sampled banks.

- Pearson correlation analysis shows that the dependent variable return on assets has a negative correlation with non-performing asset to total loan and advance ratio i.e., -0.193 indicating that as the non-performing assets increase the return on assets decreases. The number of non-performing assets reduces the interest income of the commercial banks and as result decreases the net income, hence reducing the return on assets. It also shows that it has there is a negative correlation between return on assets and CAR i.e., shareholder's equity to total risk-weighted assets ratio with a coefficient of -0.042. This implies that as the capital adequacy ratio of commercial banks increases the return on assets decreases. The increase in the CAR ratio creates a situation of unutilized funds for investments and lending thus reducing the returns of banks.

- Return on assets has a positive correlation with liquidity ratio since the coefficient is 0.061 indicating that an increase in the LQDT ratio increases the return on assets of commercial banks during the study period. Also, the positive correlation with the interest rate spread with a coefficient of 0.458 indicates that as the rate of interest spread increases, the return on assets of the commercial bank also increases

- Pearson correlation analysis shows that the dependent variable return on equity has a negative correlation with the non-performing assets ratio i.e., -0.110. It is also negatively correlated with the capital adequacy ratio i.e., -0.514. This indicates that as this ratio increases the return to equity decreases and vice-versa.

- Return on equity is positively correlated with liquidity ratio i.e., 0.054 and with interest rate spread i.e., 0.492. This implies that an increase in the LQDT ratio and interest rate spread increases the return on equity of commercial banks. Similar to the effect on return on assets, the increase in the liquidity ratio increases the degree of cash convertibility for the profitable investments whenever requires thus increasing the return on equity and vice versa.

- Regression analysis with dependent variable return on assets shows that there is a statistically significant negative relationship with independent variables i.e., non-performing assets ratio with coefficient -0.131 and liquidity ratio with coefficient 0.017. This rejects our prior null hypothesis since the calculated P-value is less than 0.05. This implies that as these ratios increase the return on assets of the sampled commercial banks decreases and the relationship is statistically significant. Return on assets has a significant positive relationship with the interest rate spread with a coefficient of 0.404 implying that as the interest rate spread increases, the return on assets also increases. This also rejects our prior null hypothesis since the calculated P-value is less than 0.05.

- Return on assets has an insignificant negative relationship with capital adequacy ratio with the coefficient of -0.006, which supports our prior hypothesis. This implies that if we increase shareholder's equity to total assets ratio by 1 unit, the average influence on return on assets decreases by 0.006 units.

- Regression analysis with dependent variable return on equity shows that there is a significant negative relationship between non-performing assets ratio with coefficient -1.044 and capital adequacy ratio with coefficient -2.228. This rejects our prior null hypothesis. This implies that as these ratios increase the return on equity of the sampled commercial banks decreases and there exist a statistically significant relationship. Return on equity on the other has shown a positive significant relationship with the interest rate spread with a coefficient of 5.686. This also rejects our prior null hypothesis and implies that with the increased interest rate spread by 1 unit, the average influence on return on assets also increases by 5.686 units.

- Return on equity has an insignificant positive relationship with liquidity ratio having the coefficient value of 0.138. This also supports our prior null hypothesis and implies that indicates if we increase the liquidity ratio by 1 unit, the average influence on return on equity also increases by 0.138 units.

In the current highly competitive market out of the various kinds of loans, SME loans or loans provided to small and medium enterprises have the highest risk of turning bad.

Similarly, the microfinance sector of loans has the most defaulters out of the selected sectors. These sectors and kinds of loans need to be specially monitored and a proper risk-reward analysis needs to be done before providing further loans to reduce the risk of default. The need to control the defaulting loans has been highly stressed. Regular follow-up monitoring received the highest responses in terms of measures that need to be taken by the banks to resolve the problems of non-performing assets. Thus, proper monitoring should be strictly in place to ensure regular and timely follow-ups.

5.2 Conclusion

This study is focused to examine the effect of NPA on profitability of commercial banks in Nepal. The regression results indicate that NPA negatively affects profitability of commercial banks in Nepal. The study found that NPA ratio measured by NPA/total loans and advances is appropriate and significant in explaining effect of NPA on profitability of commercial banks. The findings also indicated that Random effect regression using econometric model is appropriate for testing the effects of NPA on profitability using NPA ratio as independent variable along with its controlling variables like liquidity ratio, capital adequacy ratio and interest rate spread whereas the dependent variables return on assets and return on equity respectively. This study therefore confirmed that NPL negatively affects profitability of commercial banks in Nepal. The findings are supported by Manu and Maheshwari (2018), Arasu et al. (2019), Wadhwa and Ramaswamy (2020) and Hersugondo et al. (2021).

Thus it can be concluded that the profitability of commercial banks in terms of ROA and ROE are sensitive to non-performing assets. So special attention is to be given to borrowers of these sectors with proper credit assessment and risk and reward analysis. The critical factors of high NPA are lack of a proper credit appraisal system, economic turmoil, and fierce competitive pressure leading to relaxed credit appraisal standards. Thus, there should be a regular and strict follow towards loans that have become due since it is a key action in reducing the level of non-performing assets. If the problem is not addressed properly, it dilutes the profitability and erodes the bank's reputation as well.The summary and conclusion of this study are as bellows:

- This study focused on -performing assets as the main independent variable and capital adequacy ratio, liquidity ratio, interest rate spread are control independent

variables where as ROA and ROE are the dependent variables for evaluating banks' profitability. But the same study could be developed by including more significant independent and financial performance indicators as dependent variables in the regression model along with the increase in sample size.

- The findings of the study could be used in other areas of financial sector to know the effect of NPA towards profitability.

5.3 Implication

The critical element revealed by this study is that higher and unmanaged non-performing asset reduces the profit of banks. In the current context of the Nepalese banking industry where there is fierce competition among banks, even a slight dilution in profit is not acceptable. The increasing level of non-performing assets not only reduces the profitability of the banks in terms of ROA and ROE but also determines the overall financial along with operational health of the organization.

Based on findings from the study, the below-mentioned implications have been forwarded:

- To strengthen asset quality, mainly loans, it is strongly recommended that management of banks and officers who are primarily responsible for loans should always pay serious attention to the status of asset quality of commercial banks specifically loans concerning its performance for preventing loans loss. To curtail the chance of occurrence of non-performing assets; the bank managers should give due emphasis to the asset management decision.

- To reduce the level of NPA banks should be more cautious towards the supervision and management of the credit risks. For this, a protection in advance strategy is suitable. During the execution of the loan, the agreement bank should evaluate the potential risks that may cause the borrower to default on its loan obligation. For this appropriate credit policies and standards, procedures are required.

- Huge portion of default loans belong to microfinance and SME sector, therefore commercial banks should analyze collateral and retain adequate security to cover

them from losses. Thus, there should be the continuous follow-up to support the recovery.

- Since a strict credit appraisal is critical to controlling non-performing loans, employees and the management team must be provided training programs regarding loan management, risk management, and credit assessment.

- Banks should avoid overvaluation of collateral and aim to take enough collateral against risky loans so that they can recover their principal amount in case of default.

- The study observed a negative relationship between the non-performing assets ratio and return on assets. Hence, banks should maintain a good governance policy that includes non-performing assets along with its proper management.

- The study observed that there exists a negative relationship between return on equity and non-performing assets ratio. So, the commercial banks should pay more concentration on strict credit appraisal so that future defaulting loans can be controlled and equity holders shall receive maximum returns in the future.

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Appendix 1: Non-performing assets ratio

Year/ Bank	BOK	EBL	HBL	MBL	NABIL	NCC	NIBL	NIC	NSBI	SBL
2011/12	2.30	0.84	2.09	2.84	1.77	3.82	3.32	0.60	0.54	1.52
2012/13	1.50	0.62	2.89	2.84	2.26	2.73	1.91	0.73	0.37	2.39
2013/14	1.06	0.97	1.96	1.78	2.13	2.80	1.77	2.32	0.26	2.75
2014/15	3.47	0.66	3.22	0.64	2.25	2.75	1.25	2.33	0.19	1.80
2015/16	2.51	0.38	1.23	0.55	1.14	1.93	0.68	2.07	0.14	1.47
2016/17	1.29	0.25	0.85	0.38	0.80	7.49	0.83	0.36	0.10	1.30
2017/18	3.04	0.20	1.40	0.44	0.55	3.87	1.36	0.06	0.20	1.09
2018/19	1.54	0.16	1.12	0.37	0.74	2.78	2.78	0.46	0.20	0.75
2019/20	2.28	0.22	1.01	0.52	0.98	2.86	2.91	0.75	0.23	1.38
2020/21	1.04	0.12	0.48	0.62	0.84	1.76	2.46	0.50	0.23	1.00

Source: Annual report of bank

Appendix 2: Return on assets ratio

Year/ Bank	BOK	EBL	HBL	MBL	NABIL	NCC	NIBL	NIC	NSBI	SBL
2011/12	1.31	0.89	1.68	1.02	1.71	0.99	1.56	1.09	0.70	1.25
2012/13	1.33	1.43	1.79	1.02	1.58	1.14	1.19	1.32	1.17	1.26
2013/14	1.88	1.94	2.21	1.61	2.11	1.15	1.79	1.56	1.94	1.49
2014/15	1.45	1.97	1.67	1.47	2.61	1.83	2.13	0.97	1.97	1.59
2015/16	1.57	1.83	2.03	1.89	2.69	0.75	2.10	1.64	1.57	1.53
2016/17	0.82	1.85	1.34	1.51	2.32	2.03	2.00	1.51	1.70	1.69
2017/18	0.74	1.85	1.30	1.26	2.06	1.14	1.90	1.21	1.80	1.51
2018/19	0.65	2.25	1.54	1.12	2.65	1.14	2.30	1.71	1.51	1.74
2019/20	1.90	2.39	1.76	0.49	3.25	1.46	2.60	1.78	1.19	1.43
2020/21	2.10	2.11	1.91	0.16	2.80	1.37	1.60	1.64	0.83	1.12

Source: Annual report of bank

Appendix 3 : Return on equity ratio

Year/ Bank	BOK	EBL	HBL	MBL	NABIL	NCC	NIBL	NIC	NSBI	SBL
2011/12	10.38	9.70	17.54	14.43	13.52	9.58	12.76	18.64	6.66	16.27
2012/13	11.79	15.51	17.78	12.11	13.82	9.39	10.39	22.12	11.55	15.07
2013/14	16.06	20.87	21.51	17.84	22.89	13.89	15.32	25.49	19.46	18.07
2014/15	24.07	14.76	21.11	13.31	29.15	23.60	19.16	10.66	17.34	10.78
2015/16	16.69	23.16	22.99	16.39	23.80	8.92	18.21	16.93	17.08	14.00
2016/17	10.64	25.06	27.84	19.49	32.48	23.77	16.70	16.77	23.25	24.51
2017/18	10.05	28.67	18.56	19.16	28.64	15.32	24.73	15.14	23.18	24.62
2018/19	15.70	32.16	20.81	16.57	35.84	16.27	27.45	18.57	24.23	31.11
2019/20	22.86	35.31	22.12	5.97	40.85	19.29	32.91	14.77	24.30	22.50
2020/21	25.01	35.03	26.34	0.41	37.68	11.31	25.54	19.73	16.69	15.31

Source: Annual report of bank

Appendix 4: Liquidity ratio

Year/ Bank	BOK	EBL	HBL	MBL	NABIL	NCC	NIBL	NIC	NSBI	SBL
2011/12	5.34	18.15	26.51	27.08	3.66	2.86	4.4	20.65	3.22	3.54
2012/13	11.39	14.43	31.39	23.83	11.2	2.78	8.7	27.09	8.89	5.03
2013/14	6.92	18.56	26.25	23.7	4.78	3.87	5.5	26.05	6.65	4.56
2014/15	7.3	17.75	23.05	25.26	10.05	7.49	8.2	24.45	7.18	6.37
2015/16	9.36	16.52	26.64	26.29	10.02	0.91	10.5	25.8	10.04	8.68
2016/17	8.71	16.61	8.32	6.84	6.77	8.88	7.2	23.79	8.83	6
2017/18	9.98	24.27	8.72	11.02	14.15	12.07	12	28.91	10.92	8.63
2018/19	6.82	16.91	6.08	9.24	11.32	17.92	19.2	28.68	9.32	17.22
2019/20	9.41	15.19	8.72	11.07	9.32	13	16	29.27	9.58	9.6
2020/21	8.72	17.22	5.57	15.34	8.6	20.06	13.6	28.84	8.33	11.86

Source: Annual report of bank

Appendix 5: Capital adequacy ratio

Year/ Bank	BOK	EBL	HBL	MBL	NABIL	NCC	NIBL	NIC	NSBI	SBL
2011/12	10.87	8.82	9.44	6.91	11.48	9.62	11.38	4.60	10.13	7.20
2012/13	11.27	8.22	9.03	7.97	10.85	12.11	11.05	5.14	9.72	7.69
2013/14	11.55	8.19	9.74	8.47	9.62	12.03	10.98	5.37	9.71	8.29
2014/15	11.19	8.12	9.78	9.93	8.29	8.24	10.23	5.83	10.27	8.68
2015/16	8.95	7.32	8.69	10.57	9.88	8.48	11.04	8.58	8.74	8.90
2016/17	8.57	5.99	6.76	7.29	6.81	7.97	11.07	7.73	7.00	6.29
2017/18	7.54	5.45	7.09	6.29	6.12	8.13	7.14	7.78	7.57	5.60
2018/19	8.24	6.74	7.03	6.54	7.14	8.41	7.63	8.21	6.05	5.75
2019/20	8.04	6.25	7.34	8.39	6.98	7.24	7.76	8.69	4.82	6.09
2020/21	8.16	5.50	7.15	10.36	6.38	8.77	7.40	7.71	4.77	6.43

Source: NRB monthly report

Appendix 6: Interest rate spread

Year/ Bank	BOK	EBL	HBL	MBL	NABIL	NCC	NIBL	NIC	NSBI	SBL
2011/12	3.03	3.24	3.32	3.82	3.31	3.76	3.89	3.25	3.18	3.70
2012/13	3.81	3.59	3.77	4.36	3.51	3.84	4.83	4.18	3.87	4.81
2013/14	4.40	4.29	4.47	4.27	4.19	4.70	4.32	5.02	4.43	3.72
2014/15	4.98	4.72	4.70	4.75	4.48	4.12	4.30	3.60	4.99	3.53
2015/16	4.80	4.48	4.44	4.27	4.32	3.75	4.34	3.49	3.68	3.49
2016/17	3.62	4.76	4.35	4.59	3.74	4.49	4.70	3.36	4.00	4.16
2017/18	3.93	4.76	4.54	4.65	3.97	3.48	4.60	3.19	3.85	3.86
2018/19	4.14	5.69	5.17	4.97	5.03	3.48	4.80	4.46	3.45	4.65
2019/20	4.81	5.68	4.25	4.63	5.48	3.42	5.50	3.81	3.38	4.39
2020/21	4.67	5.32	3.96	5.01	4.95	3.87	4.50	3.33	2.70	3.82

Source: Annual report of bank