CAPITAL ADEQUACY, LIQUIDITY AND 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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Dhobichour, Kathmandu

June, 2022

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RECOMMENDATION LETTER

This is to certify that the dissertation

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Entitled

CAPITAL ADEQUACY, LIQUIDITY AND PROFITABILITY OF COMMERCIAL BANK IN NEPAL

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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Chinta Mani Gautam	Sushil Kumar Pant, PhD	Bala Ram Thapa
Thesis Supervisor	**Head, Research Committee**	**Campus Chief**

Certificate of Authorship

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled "The Capital adequacy, liquidity and profitability of commercial bank in Nepal". The work of this dissertation has not been submitted previously for the purpose of conferral of any degree not it has been proposed and presented as part of requirements for any other academic purposes. The assistance and cooperation that I have received during the research work has been acknowledged. In addition, I declare that all information sources and literature used are cited in the reference section of the dissertation.

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Report of Research Committee

Mr. Sunil Shrestha has defended research proposal entitled "The capital adequacy, liquidity and profitability of Nepalese commercial bank" successfully. The research committee has registered the dissertation for the further progress. It is recommended to carry out the work as per the suggestions and guidance of supervisor sir and submit the thesis for the evaluation and viva voce examination.

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Approval Sheet

We, the undersigned, have examined the thesis entitled 'CAPITAL ADEQUACY, LIQUIDITY AND PROFITABILITY OF COMMERCIAL BANK IN NEPAL' presented by Sunil Shrestha, a candidate for the degree of Masters of Business Studies (MBS) and conducted the Viva-Voce examination of the candidate. We hereby certify the thesis is worthy of acceptance for the award of degree.

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Acknowledgements

This study was written as a master thesis during the completion of final year of from the Public Youth Campus under the Tribhuban University, Kathmandu, Nepal. This study entitled Capital Adequacy, Liquidity and Profitability of commercial banks in Nepal" has been prepared for partial fulfillment of requirements for the degree of Master of Business Studies. This would not have been possible without the kind support and help of many individuals. I would like to express their gratitude to the persons involved in the making of this research. First and foremost, I would like thank Public Youth Campus for accepting me as a student of the master degree program. And my deepest gratitude goes to my principal supervisor, Mr. Chinta Mani Gautam, for his commitment, invaluable supervision, scholarly support and dedication of time, without which this thesis would not have become a reality. Similarly special thanks to Mr. Bala Ram Thapa, Campus Chief for his kind cooperation for valid suggestion to prepare this report. My thanks also goes to all well-wishers for their valuable comments, understandings and encouragement when it was required. I greatly thanks to my all friends for his support help and support, I have been able to complete this research. I would like to take the responsibility of any possible mistake that may have occurred in the report. I would be delighted to welcome readers for their suggestion and recommendation to improve the report.

Sincerely,
Sunil Shrestha
Date:

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Abbreviations

AVG	:	Average
BCBS	:	Basel committee on banking supervision
BOKL	:	Bank of Kathmandu
CAR	:	Capital adequacy ratio
CV	:	Coefficient variation
EBL	:	Everest Bank Limited
HBL	:	Himalayan Bank Limited
KBL	:	Kumari Bank limited
LBL	:	Laxmi Bank Limited
LQR	:	Liquidity ratio
MAX	:	Maximum
MBL	:	Machapuchhera Bank limited
MIN	:	Minimum
N	:	Number of observation
NABIL	:	Nabil Bank Limited
NCCB	:	Nepal credit And Commerce Bank Limited
NIBL	:	Nepal Investment Bank limited
NPL	:	Non-performing loan ratio
NRB	:	Nepal Rastra Bank
NSBI	:	Nepal State Bank of India
P	:	Significance Level
PCPS	:	Perpetual Cumulative Preference Shares
r 2	:	Determinants

r	:	Correlation coefficient
ROA	:	Return on assets
ROE	:	Return on equity
RWA	:	Risk- weighted assets
SBL	:	Siddhartha Bank limited
SCB	:	Standard Charter Bank limited
SD	:	Standard Deviation
SD	:	Standard deviation
UK	:	United Kingdom

Abstract

The primary functions of commercial banks are raise and utilization of funds. Commercial banks collect a large amount of deposit from general public. The bank should hold an adequate capital secure the interest of depositors. The aim of this study is to quantify the impact and simultaneously, the results is corroborating with the hypothesis that there is no significant impact of capital adequacy variables on the profitability of commercial banks in Nepal. Out of prevailing 27 commercial banks, secondary data of ten commercial banks from 2011/12 to 2020/21 were considered to analyze the factors that affect profitability.

The descriptive statistics shows that, Nepalese commercial banks are earning satisfactory profit with average variation of return. The average capital adequacy ratio (CAR) is higher than regulatory requirement of 10%. It is the evidence of the compliance of NRB directives and Basel III requirement. The LQR shows that liquidity position of the commercial bank and aggressiveness of bank in lending funds which ultimately results in better profitability. The CDR shows that the total credit to deposit position of the commercial bank. NPL shows low return and high risk in Non-performing loan. The correlation coefficient shows the positive and negative impact of the dependent and independent variables. The correlation coefficient between CAR and ROA is positive. It indicates that there is positive correlation between CAR and ROA. It means capital adequacy ratio increase/decrease than ROA also increase/decrease. The correlation coefficient between LQR, CDR and NPL is negative related with ROA. It shows that higher the LQR, CDR and NPL the lower will be the profit of the commercial banks in Nepal. The correlation coefficient between CAR, LQR, CDR and NPL is negative correlation coefficient with ROE. It observed that increase the CAR, NPL, CDR and LQR than decrease with ROE. It is negative correlation between CAR, NPL, CDR and LQR with ROE. The regression analysis shows relationship with independent and dependent variables both. There is insignificantly negative relationship between ROA with CAR. There is significant relationship between NPL and LQR with ROE. Regression analysis shows positively insignificant relationship between CDR with ROA. There is significantly negative relationship between CAR, NPL and LQR with ROE. There is positive significantly relationship between CDR with ROE.0

KEYWORDS: Capital adequacy ratio, Return on assets, Return on equity and Econometric regression model.

CHAPTER I
INTRODUCTION

1.1 General background

Capital adequacy is the quantity of capital a financial institution and the different economic group has to keep as required with the aid of using its economic regulator. To create a sound and healthy economic machine, sensible and green law is important. The economic quarter is ordinarily the way for shifting and reworking the saving of a financial system into its funding. Financial establishments are establishments that keep economic assets along with mortgage and advances, funding, etc, and that achieve the fund for these investments with the aid of issuing liabilities along with shares, gathering deposits, etc. Risks are worried while the economic machine channels assets from savers to investors. Therefore, the well-functioning economic quarter attempts to make the maximum efficient use of financial savings and screen carefully to make ascertain that the productiveness is ascertained Athanasoglou et *al.* (2006).

Capital adequacy rules are safety valve for regulators and banks' clients/shareholders to reduce expected risks faced by commercial banks especially for cross border transactions as these rules are applied compulsory by all banks internationally. Applying these rules will achieve rational management and governance (El-Ansary & Hafez, 2015). Capital adequacy ratio (CAR) is an important indicator of bank safety sustainability. Banks that can guarantee CAR means the bank has the power to resist the financial crisis, protecting the bank itself and funds from depositors (Usman et al. 2019).

Risk to a bank may arise due to expected and unexpected events which are responsible for an adverse impact on the bank's capital and profitability. Today's zero risk business does not exist and risk has always existed in business. Banking is a risky business and the banks assume various kinds of risks in the process of providing financial services. Hassan (2010) studied the performance of Islamic banks worldwide from 1994 to 2001. Several internal and external banking factors were used to predict profitability and the result remarked high capital lead to high profitability. Abreu (2011) found that well-capitalized banks face lower expected bankruptcy costs and thus the low cost of funding resulting in better profitability. Capital is an

essential factor in the perpetual continuity of a bank. A minimum amount of capital is required to ensure the safety and soundness of the bank and therefore the trust and confidence of the customers. Alajmi et *al.* (2015) opined that a bank with a sound capital position can pursue business transactions more effectively and efficiently to counter unexpected losses and ensure the required profits.

Khalid (2011) examined the impact of capital adequacy requirements on the profitability of private banks in India and found that there was no significant impact of capital adequacy, non-interest income, and net interest income on the profitability of the private commercial banks. Various financial ratios employed along with regression suggest that the null hypothesis stands committed. The study further finds out that the non-risk weighted capital adequacy measures (i.e. equity capital ratio) are negatively related to the profitability of a bank. Capital adequacy ratio (CAR) is the ratio that determines the capacity of a bank in terms of meeting the time liability and other risks such as credit risk, market risk, operational risk, other so on. It is measured how much capital is used to support the bank's risk assets. These requirements are put into place to ensure that these institutions aren't participating or holding an investment that increases the risk of default and that they have enough capital to sustain operating losses while still honoring withdrawals. Hadjixenophontos et al. (2018) analyze that capital adequacy ratios are involved by a financial institution of the bank such as profit and loss sharing financing and that made it unequal capital standard from time to time or from bank to other, banks must keep capital adequacy at a specific minimum level to avoid risk and bankruptcy. The regulators of capital requirements seek to ensure that risk exposure on Nepalese financial institutions is backed by an adequate amount of high high-quality capital which absorbs ongoing concerns. This ensures Nepalese banks further promote their cushion of assets that can be used to meet claims in liquation.

Olalekan et al. (2013) observed that the Capital adequacy is the amount of capital a bank or another financial institution has to hold as required by its financial regulator. This is usually expressed as a capital adequacy ratio of equity that must be held as a percentage of risk-weighted assets. These requirements are put into place to ensure that the financial institutions do not take on excess leverage and become insolvent. Capital requirements govern the ratio of equity to debt, recorded on the assets side of a firm's balance sheet. The capital requirement should not be

confused with reserve requirements, which govern the liabilities side of a bank's balance sheet- in particular, the proportion of its assets banks must hold in cash or highly-liquid assets. Liquid assets include cash and bank balances, money at call and short notice having the placement of up to 90 days, and investments in government securities (Olalekan et al. 2013).

El-Ansary et *al.* (2015) revealed that a higher level of capital tends to have a positive effect on the efficiency levels of the banks. Banks are expected to absorb the losses from the normal earnings, but there may be some unanticipated losses that cannot be absorbed by normal earnings. Capital becomes useful in such abnormal loss situations to cushion the losses. In this way, capital plays an insurance function. Adequate capital in banking is a confidence booster. It provides the customer, the public, and the regulatory authority with confidence in the continued financial viability of the bank. Capital (equity and long-term debt) represents a source of funds for the bank along with deposits and borrowings.

The capital adequacy ratio shows the internal strength of the bank to withstand losses during a crisis. It is directly proportional to the resilience of the bank to crises. It has also a direct effect on the profitability of banks by determining its expansion (Sangmi & Tabassum, 2010). Angbazo (1997) found that banks well-capitalized were more profitable than others in the USA. Onadapo and Olufemi (2012) studied the effect of capital adequacy on the profitability of the Nigerian banking sector. They found that performance indicators of Return on Assets, Return on capital employed and efficiency ratio among others do not reflect much on the Capital adequacy ratio of the Nigerian Banking sector. Risk to a bank may arise due to expected and unexpected events which are responsible for an adverse impact on the bank's capital and profitability. Under pillar I of Basel II, a regulated institution must calculate the minimum capital required to cover losses for each of its Credit, Market & Operational risks and then add them together to arrive at an overall Minimum Capital requirement. The Basel Committee on Banking Supervision 1988 accord, commonly known as Basel I, called for a minimum capital ratio of capital to risk-weighted assets of 8% to be implemented by the end of 1992 (Bhowmick & Srivastava, 2017).

Khalid (2011) Capital adequacy ratio (CAR) is a study of financial institutions' capital. It is expressed as a percent of financial institutions' chance weighted credit score exposures and is additionally acknowledged as the capital-to-chance-weighted property ratio (CRAR). It is used to

guard depositors and sell the stableness and performance of financial structures across the world. There are kinds of capital: tier one, which could take in losses without a financial institution being required to quit trading, and tire, which may soak up losses in the occasion of a winding-up and so provides a lesser degree of safety to depositors. The capital adequacy ratio is a ratio that protects the banks in opposition to excess leverage, and insolvency and maintains them out of difficulty. It is described because of the ratio of a bank's capital in relation to its current liabilities and threat weighted assets (RWA). RWA is a measure of the number of a bank's assets for threat. It is the ratio that determines the bank's capability to fulfill the time liabilities and different dangers such as credit score threat, marketplace threat, operational risk, etc.

Anggono (2015) Capital adequacy is essential for a financial institution to keep depositors' self-assurance and provide financial institutions from going bankrupt. Capital is seen as a strong help to protect depositors and promote the stableness and performance of the financial system across the world. Capital adequacy reflects the general financial situation of the financial institution and additionally the capacity of the control to fulfill the want for additional capital. It additionally suggests whether or not the financial institution has sufficient capital to soak up unexpected losses. It additionally acts as a sign of financial institution leverage

Capital adequacy is the measurement of a minimum level of capital that is required to guard a bank from assets of the portfolio. However, there exists a debate on the minimum level of capital that a bank should hold. According to the Basel accord, a bank needs to hold a minimum level of capital based on its financial condition. These types of capital regulation are friendly to the economy are these bolster bank scenarios against losses generated from different exposures like credit, operation, and markets. The study found that the regulatory capital held by banks is greater than the minimum capital requirement guided under the Basel II accord. Again, it has been shown that explanatory variables like capital adequacy, operating efficiency, and loan structure are positively related to the profitability of a bank (Datta & Muhmud, 2018).

In Nepalese context, Nepal Rastra Bank (NRB) issued some considerations for commercial banks in order to create healthy banking system and have ability to compete with worldwide should be preparing Minimum Capital Adequacy Ratio that meets with the international standards. Capital Adequacy ratio means amount of capital to ensure that banks can handle risk

exposures. Implementing the Minimum Capital Adequacy Ratio must be adjusted to risk profile for absorb the potential losses on risk exposure as well as to fulfilling the minimum capital requirement. The Basel III norms stipulated a capital to risk weighted assets of 8%. However, as per NRB norms, Nepal scheduled commercial banks are required to maintain a CAR of 11%. Hence, the survival of Banks is vested with the maintenance of sufficient capital and it serves as buffer in the event of liquidity crunch. In this regards, the main research question of this study as follows: What are the determinants of capital adequacy ratio of commercial banks in Nepal?

NRB, (2015) examine that the central bank is responsible for establishing the regulatory and supervisory framework for the smooth operation of banking and financial institution in every country. In our country, Nepal Rastrya Bank plays the role of the central bank. NRB lays down various rules and regulations for banks and the bank needs to follow them. Generally, to bring uniformity and amend the rules and regulations, NRB issues directives to the commercial banks from time to time and amend them on the basis of need. The commercial bank has to modify its functions accordingly. The NRB directive no1 includes the capital adequacy norms for the commercial banks representing the requirements of maintaining a capital fund to the prescribed ratios. The directives are said to be based on the internationally accepted norms of the Basel Committee. The Basle Committee on banking supervision is a committee of banking supervisory authorities which was established by the central bank Governors of the Group of Ten countries in 1997. The Basle Committee on banking supervision 1988 has developed an internationally accepted standard for capital adequacy based on what is known as the "risk assets" approach. The committee consists of senior representatives of bank supervisory authorities and central banks from Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, Netherlands, Sweden Switzerland, the United Kingdom, and the United States. Widely accepted, though national authorities are free to impose higher standards on their banks and often do so. As originally designed, this approach was only concerned with credit risk, but at the beginning of 1996, the Basel Committee published a proposal to bring market risks into the calculation of capital requirements. Capital is required by a bank as a cushion to absorb losses, which should be done by the shareholder and to finance the infrastructure of the business. Capital is required by a bank as security against bank corruption (NRB, 2017).

Capital adequacy is important for a bank to maintain the depositor's confidence and presenting the bank from going bankrupt. Capital is seen as a strong support to protect depositors and promote the stability and efficiency of the financial system around the world. Capital adequacy reflects the overall financial conditions of the bank and also the ability of the management to meet the need for additional capital. It also indicates whether the bank has enough capital to absorb an unexpected loss. It also acts as an indicator of bank leverage Capital adequacy measures the financial strength of the financial institution. It tells how much capital it has a relative (as the percentage of) the money it has lent out i.e. its assets (NRB, 2019).

Pradhan and Bhattarai (2016) revealed that there is a negative impact of financial leverage on return on assets, return on equity as well as net interest margin of banks. Equity debt has a negative relationship with return on equity and net interest margin. Udas (2007) revealed that there was a significant impact of NRB directives of capital adequacy on the various aspects of the commercial banks and it also helped in maintaining the stability of commercial banks in the financial market and to uplift the banking sectors in Nepal to international standard. Sedhain (2012) concluded that capital adequacy has helped in developing suitable prudential norms to save the banks and financial institutions from financial crisis and signals of failure. The dissertation further concluded that the operating environment of the bank has changed radically, and its risk management system has also improved.

The banking sector plays a significant role in the development of any country's economy. It acts as a bridge between people with money who need it. Commercial banks are classified as 'A' class banks in Nepal on the base of their nature of work and capital requirement. Gautam (2019) examine the impact of capital adequacy and bank's operational efficiency on the profitability of Nepalese commercial bank. The study is conducted using a commercial bank operating in Nepal for the period of 2007/08 to 2016/17. The dependent variable is ROA while the independent variables are capital adequacy ratio, operation efficiency, loan to deposit, bank size, and equity ratio. The result indicates that CAR has a significant relationship with profitability.

In order to ensure smooth migration to Basel III without aggravating any near-term stress, appropriate transitional arrangements have been made. Capital Ratio and deduction from common equity will be fully phased-in and implemented as on Mid June 2021. The study will have significant importance in the present context of the banking business in Nepal. Commercial

banks have collected more than millions of deposits. NRB can observe that there is a lack of adequate investment opportunity of funds. In such a situation, these deposits have to be protected by the adequate capital fund of respective commercial banks. In fact, The Bank should have adequate capital funds apart from the deposits of the public to make investments.

1.2 Problem statement

Nepal rastra bank annual report 2021 reports that there is more than Rs.4510383 million of the amounts deposited in the various bank of the country by the end of mid-June of the fiscal year 2021. But if the banks go bankrupt, what will happen to the depositors of such money? Thus, an adequate capital fund is required or enough to safeguard the money of depositors. The capital adequacy ratio is derived on the basis of total risk-weighted assets (TRWA). According to the new capital adequacy framework 2007, the minimum capital requirement for commercial banks is fixed at Tire 1 (Core capital 6% of risk-weighted assets and a total of 10% of risk-weighted assets.

If commercial banks are fails to maintain or meet the standard, they will have to face not only the difficulty in maintaining the liquidity but will be penalized by the regulatory authority as well. However, they are allowed to comply with the norms, stage by stage within the specified period. Hence, this is closely concerned with whether the selected sample banks are able to manage capital adequacy and profitability. Although the banking industry in Nepal is making remarkable progress and growth, it is not without any problems. In the present context, the problem faced by the overall business sector including the banking sector is the unstable political condition prevailing in the nation and the poor economic growth of the nation as a whole (NRB, 2015).

Due to securities issued and the unstable political condition of the country, the government is not paying sufficient attention to the economic sector. Regulation and monitoring by the government have been weakened in the banking sector as in order sectors whereby unfair competition is increasing. But besides these common problems, another problem faced by the banking industry is the lack of optimal capital. Also, some banks were found to be reined by the excess burden of the cost of debt capital even among listed commercial banks. So, to face above- mentioned instability and risk, banks have to do some precautions before they lay down. If any financial institution lay down, people will not only have a generalized negative perception of the financial

institution sector as a whole but will also deteriorate the financial healthiness of the Nepalese economy. To avoid these conditions, Nepal Rastra Bank, as a regulatory body of the Nepalese financial institution sector, implements many policies and directives such as an anti-money laundering system, BASEL guidelines, capital adequacy frameworks, and many more. The capital adequacy ratio is based on the total risk-weighted assets. According to NRB directives; commercial banks should maintain their core capital at 4.5% and capital fund at 8.5% of the total risk-weighted assets of the Capital adequacy framework. Due to the lack of capital adequacy structure, Nepalese banks are under international standards. It will obviously increase competition for the survival which might lead to keen rivalry among them to occupy the larger market share (NRB, 2019/20).

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 own 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 risk-weighted 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).

In the context of Nepal, many researchers are a researcher for capital adequacy and profitability of the commercial bank in Nepal but some researcher doesn't find out the exact point of view of capital adequacy and profitability in Nepalese commercial bank in Nepal. Many researchers have used different variable and non-variable tools and techniques as well as used different financial tools and analytical tools but anyone researcher doesn't find out the exact point of capital adequacy and profitability impact on Nepalese commercial banks in Nepal. During this time many researchers have said a different meaning and find out of capital adequacy and profitability of the commercial bank in Nepal. So this study has tried to explain and help a find out the data and what is the main impact of the capital adequacy on the profitability of the commercial bank in Nepal (Pradhan et al. 2016).

The main area of the study is to find out the tendency of capital development in line with banking compliance of commercial banks as well as whether banks are financially healthy and strong again risky investments. Due to differences in economic, political, and financial situations, legal and other restrictions, government policies, risky business, management ownership, control and other variables, provisions of capital adequacy may be different in different years. More specifically, the study seeks to solve the answer to the following questions:

- What is the capital adequacy position of Nepalese commercial banks?
- What is the impact of CAR on Nepalese commercial banks profitability (ROA and ROE?
- What is the impact of NPL on Nepalese commercial banks profitability (ROA and ROE?
- What is the impact of LQR on Nepalese commercial banks profitability (ROA and ROE?
- What is the impact of CDR on Nepalese commercial banks profitability (ROA and ROE?

1.3 Objective of the study

The main objective is to examine of the study is to assess the relationship between capital adequacy and profitability of sample selected commercial banks. The other specific objectives are as bellows:

1. To assess the capital adequacy position of selected commercial banks.
2. To analyze the relation of capital adequacy on return on assets (ROA).
3. To examine the impact of capital adequacy ratio (CAR) on return on equity (ROE).
4. To examine the impact of non-performing loan on ROA and ROE.
5. To analyze the impact of credit to deposit ratio on ROA and ROE.
6. To assess the impact of liquidity ratio on ROA and ROE.

1.4 Hypothesis

This study attempts to find out the relationship between the capital adequacy and on the profitability of commercial banks in Nepal. The following null hypotheses are formulated are as given bellows:

Ho1: There is no significant relationship between capital adequacy ratio and return on asset.

Ho2: There is no significant relationship between capital adequacy ratio and return on equity.

Ho3: There is no significant relationship between non-performing loan and return on asset.

Ho4: There is no significant relationship between non-performing loan (NPL) and return on equity (ROE).

Ho5: There is no significant relationship between credit to deposit ratio and return on asset.

Ho6: There is no significant relationship between credit to deposit ratio and return on equity.

Ho7: There is no significant relationship between liquidity ratio and return on asset (ROA).

Ho8: There is no significant relationship between liquidity ratio and return on equity (ROE).

1.5 Rational of the study

Banks are the modern world face an inherent risk of insolvency. Since the banks are so highly leveraged, there could be a run on the bank at any moment if their reserves are considered to be inadequate by the market. The study will help them to take corrective action to optimize the value of the bank by using optimal capital adequacy. Banks are the essential support to the financial sector, which facilitates the proper utilization of financial resources of the country. The banking sector is increasingly growing and has witnessed a huge flow of investment. The financial system, the bank, in particular, is exposed to a variety of risks that are growing more complex nowadays. To cope with the complexity and the mix of risk exposure to the banking system properly, responsibly, beneficially, and sustainably, it is of great importance to evaluate the overall performance of the banking supervision framework. One such measure of supervisory information is the capital adequacy framework as per NRB. The findings of this research provide a valuable contribution to the development and enhancement of deposit mobilization sectors in the Nepalese banking sector through various means as follows:

- This research is useful for decision-makers and policy planners both in banking and other financial sectors.
- This study offers an overall background of the Nepalese financial sector and NRB regulation on commercial banks.
- It analyzes how the banks are complying with various policies and legislation regulating the financial sector.
- It helps the management of various banks to know where they fall behind and where they are doing better.

The banks should have adequate capital funds though there are plenty of investment opportunities. Currently, raising capital is a tough task. The increasing nonperforming assets,

being the main headache of commercial banks, meeting the capital adequacy is very tough, however, it is not impossible. It has been observed that any study has not been undertaken regarding the capital adequacy norms for a commercial bank. Raising capital is a tough task at present. The increasing nonperforming assets are the main problem of commercial banks due to which meeting the capital adequacy is very tough, although it is not impossible.

1.6 Limitations of the study

The study is limited to the capital fund and capital adequacy norms for selected commercial banks. It is not possible to take all commercial banks as a sample, thus this thesis analyzes the capital adequacy and profitability of randomly selected commercial banks only.

No, any research can go beyond limitations and this study has also no exception. The study has been conducted as partial fulfillment of the requirements of 'Master of Business Studies" and the assessment of bank capital show the overall capital development of the bank and its governing norms. Since this is the analysis of bank capital under its governing standards; it primarily incorporates financials as disclosed under regulatory constraints.

Besides the above-mentioned procedure and strengths, there are some limitations, which cannot be ignored. The study has limited resources and it is difficult for the researcher to find out new aspects. Reliability of statistical tools used and lack of research experience are the major limitation and some other limitations. The scope of the present study has been limited in terms of the period of study as well as nature and sources of data. The following points highlight the major findings of this study are as bellows:

- The study is fully based on secondary data as the commercial bank does not provide full internal information.
- Only random selected Nepalese commercial banks are considered for the study.
- For Analyzing and presenting the data only some important financial and statistical tools have been used accordingly as Necessary.
- The profitability of commercial banks is influenced by several factors however; this study mainly focuses only on capital adequacy.
- Out of many financial dependent and independent variables, only minimum related variables like capital adequacy ratio, profitability, return on assets, and return on equity with capital regulation are considered in the preparation of this report.

- Only limited statically tools like mean, median, correlation, and regression analysis for the assessment of data have been used for the current research.
- Furthermore, this study cannot be generalized as the current study has been made on data of the past ten years from the fiscal year 2011/12 to 2020/21 of the random sample selected commercial bank only.

1.7 Organization of the study

This report of the study entitled "Capital adequacy and profitability of commercial Banks in Nepal" has been organized into five chapters. The structure of the thesis report comprises a total of five chapters which have briefly described are as bellows:

Chapter 1: Introduction

To start the thesis report, this First chapter includes the background of the study, the problem statement, the objective of the study, the rationale of the study, the limitation of the study, and the organization of the study. This chapter has been targeted to help the reader to understand to get the rhythm of the subject matter of the thesis reports.

Chapter 2: Review of literature

This second chapter in the review of literature includes reviews of articles and journals, annual reports published by the sample selected bank and related authorities, review of relater "capital adequacy and profitability of a commercial bank in Nepal" related writers journals and articles.

Chapter 3: Research methodology

The third chapter includes the interpretation parts which are research design, sources of data, analysis of data, population and sampling, and tools and techniques for analysis which are ratio analysis and statistical tool have been included in this chapter.

Chapter 4: Presentation and analysis of data

The four-chapter deals with the processing, analysis, and interpretation of the data, the presentation and analysis of relevant data through a defined course of research methodology with

the financial and statistical analysis related to Capital adequacy and its impact on the profitability of the commercial bank. And major findings of the study are also included in this chapter.

Chapter 5: Summary, conclusion, and Recommendations

In this chapter, the summary of the entire thesis has comprised. This chapter further describes the major findings of the thesis. The conclusion of the study has also been included in this chapter and recommendations for the improvement in the future performance of the sample Selected bank. Finally, references and appendices have been presented at the end of the dissertation.
Besides these chapters, References and appendices are also included in a research paper.

CHAPTER II
LITERATURE REVIEW

In this chapter, the review of various articles, research studies, journals, and books has been made to have a clear understanding of the impact of capital adequacy on the profitability of the Nepalese commercial bank and its relevance in different parts of the world. This chapter will help to recall the theories and previous studies made by various researchers in different parts of the world. The literature review is basically a stock-taking work of available literature. The purpose of the literature review is thus to find out what principles are established and what research studies have been conducted in the field of study and what remains to be done.

2.1 Conceptual review

2.1.1 Overview of capital and capital adequacy

The Bank capital is an important role in maintaining the safety and reliability and durability of the banks and the integrity of the financial system. In general, capital represents the wall or barrier that prevents any unexpected loss exposed to the bank that affects depositor's money, as well known, the banks generally operate in an environment with a high degree of uncertainty which results in exposure to many risks. Banks are exposed to two main types of loss risks; expected losses which occur frequently in any bank and the size of these losses are usually small. Unexpected losses occur rarely, but the impact on the bank is usually great. The term capital adequacy expresses the capacity and efficiency of banks that measure, direct, and control the risks it faces, in order to be scaled, control, and make decisions consistent with the strategy and policy and to strengthen their competitiveness attitude (Irawan et al. 2015). Capital adequacy is beneficial in pricing banking services and maximizing returns from a bank's operations, in addition to policy development and procedures necessary for the prevention of different types of risks, which arise as a result of technological and electronic evolution and increasing complexities in banking and competition between banks. Thus, commercial banks are obliged to provide sufficient capital to cover for any possible dangers that may occur and develop the right strategy to ensure the survival of the bank with a higher percentage than the specified percentage

and in order to avoid the intervention of monetary authorities to prevent its decline, which is known corrective actions (Yuanjuan et al. 2012).

Mekonnen (2015) observed that a very large extent, the strength of a bank depends on the capital funds available to it. A bank's capital can be defined as the equity value of a bank equated to the present value of its future net earnings. Generally, bank capital represents the owners' net worth in a bank and it includes the pay in capital and all additions to the capital resources of the bank. Bank capital also ensures the safety of a bank, it helps the bank to avoid the risk of insolvency, and also to support the credit risk a bank is called upon to assume in a normal business leading. Here, the larger the capital resources, the more loans and advances the bank could grant both in the aggregate and to single individuals. A bank's capital resources help the supervisory authorities in assessing the adequacy of its capital in relation to its loans and investments. Therefore, capital adequacy represents the number of capital resources needed by banks for their operations, consistent with the number of risks and risk assets it is assuming. Capital adequacy is the level of capital necessary for a bank as determined by the regulatory and supervisory authorities to assume the bank's financial health and soundness. Capital adequacy, the measure of the solvency of a bank, tells whether a bank has enough capital to support the risks on its balance sheet. Adequate capitalization is an important variable in business and is more so in the business of using other peoples' money such as banking (Hafez et al. 2015).

Adequate capital is required for the efficient operating and functioning of the firm in the modern competitive environment, which is always a matter of controversial debate. On one hand, holding excess capital keeps the firm in a low-profit position, on the other hand, inadequate capital limits the firm to meet the public demand for loans and low earning capacity. Capital adequacy aims at setting a minimum level of capital as a function of risks. Thus capital should be risk-based, (NRB Directives, 2019).

Khalid (2011) observed that there was no significant impact of capital adequacy, non-interest income, and net interest income on the profitability of the private commercial banks. Various financial ratios employed along with regression suggest that the null hypothesis stands committed. The study further finds out that the non-risk weighted capital adequacy measures (i.e. equity capital ratio) are negatively related to the profitability of a bank. Capital Adequacy

reflects the overall financial condition of the banks and also the ability of the management to meet the need for additional capital. It also indicates whether the bank has enough capital to absorb unexpected losses. Capital Adequacy ratios act as indicators of banks' leverage (Nyaboga, 2012). Capital Adequacy Ratio (CAR) shows the banks' ability to maintain sufficient capital. The main activity of the bank is to collect funds and channel them back into the form of loans. If a bank has enough capital or meets the requirements, it can operate to create profit. In addition, the bank can provide large loans and it has enough assets as collateral for third-party funds deposited in the bank so that it will increase public trust. The higher the CAR is better the performance of a bank. This is supported by Saeed (2014). Capital Adequacy is important for a bank to maintain depositors' confidence and prevent the bank from going bankrupt. Capital is seen as a cushion to protect depositors and promote the stability and efficiency of the financial system around the world, Khalid (2011).

Onadapo et al. (2012) studied the effect of capital adequacy on the profitability of the Nigerian banking sector. They found that performance indicators return on Assets, return on capital employed and efficiency ratio among others do not reflect much on the capital adequacy ratio of the Nigerian Banking sector. This study tries to explore various parameters pertinent to credit risk management as they affect banks' financial performance. Such parameters covered in the study were; default rate cost per loan assets and capital adequacy ratio. Financial reports of 31 banks were used to analyze for eleven years (2001-2011) comparing the profitability ratio to the default rate, cost of per loan assets, and capital adequacy ratio which was presented in descriptive, correlation, and regression was used to analyze the data. The study revealed that all these parameters have an inverse impact on banks' financial performance; however, the default rate is the most predictor of bank financial performance. The recommendation is to advise banks to design and formulate strategies that will not only minimize the exposure of the banks to credit risk but will enhance profitability.

2.1.2 Review of capital adequacy framework 2015

Prior to 1988, there was no uniform worldwide regulatory standard for setting financial institution capital necessities. In 1988, the Basel Committee on Banking Supervision (BCBS) developed the Capital Accord, that's called Basel I, to align the capital adequacy necessities applicable especially to banks in G-10 countries. Basel, I introduced key concepts. First, it

described what banks should hold as capital, as well as designating capital as Tier 1 or Tier 2 according to its loss-absorbing or creditor-protective characteristics. The second key concept introduced in Basel I was that capital has to be held by banks in relation to the risks that they face. The main risks faced by banks relate to the assets held on a balance sheet. Thus, in Basel, I calculated the bank's‟ minimum capital requirements as a percent of assets, which are adjusted in accordance with their riskiness and assigning risk weights to assets. Higher weights are assigned to riskier assets which include corporate loans, and lower weights are assigned to much less volatile property, which includes exposures to government. The BCBS released the "International Convergence of Capital Measurements and Capital Standards: Revised Framework", popularly called Basel II, on June 26, 2004. This framework was updated in November 2005 and a comprehensive version of the framework was issued in June 2006. Basel II builds extensively on Basel I by growing the sensitivity of capital to key financial institution risks. In addition, Basel II recognizes that banks can face a large number of risks, ranging from the traditional risks associated with financial intermediation to the day-to-day risks of operating a business as well as the risks related to the ups and downs of the local and worldwide economies. As a result, the framework more explicitly associates capital necessities with the specific categories of major risks that banks face. The Basel II capital framework also acknowledges that large, usually internationally active banks have already put in place sophisticated approaches to risk measurement 17 and management based on statistical inference rather than judgment alone. Thus, the framework allows banks, under certain conditions, to use their own „internal‟ models and strategies to measure the key risks that they face, the probability of loss, and the capital require to meet those losses. In developing the brand new framework, the Basel Committee incorporated many factors that help to promote a sound and efficient economic system over and above the setting of minimum capital requirements. Keeping this in mind, the Basel II framework incorporates three complementary „pillars‟ that draw on the range of methods to assist make sure that banks are adequately capitalized in commensurate with their risk profile. Again, the Basel Committee on Banking Supervision (BCBS) released a comprehensive reform package entitled “Basel III: an international regulatory framework for more resilient banks and banking systems” (called Basel III capital regulations) in December 2010. Basel III reforms are the response of the Basel Committee on Banking Supervision (BCBS) to improve the banking sector’s capacity to absorb shocks arising from financial and economic stress, regardless of the source, thus reducing the risk of spillover from the financial sector to the actual economy. Basel

III reforms strengthen the financial institution-level i.e. micro-prudential regulation, to be able to raise the resilience of individual banking institutions during periods of stress. These new international regulatory and supervisory standards mainly seek to raise the excellent level of capital (Pillar 1) to make sure that banks are better able to absorb losses on each a going concern and a gone concern basis, increase the risk insurance of the capital framework, introduce leverage ratio to serve as a backstop to the risk-based capital measure, raise the standards for the supervisory assessment process (Pillar 2) and public disclosures (Pillar 3), etc. The macro-prudential aspects of Basel III are in large part enshrined in the capital buffers. Both the buffers i.e. the capital conservation buffer and the countercyclical buffer are intended to protect the banking sector from durations of excess credit score growth. The Basel Committee on Banking Supervision's (BCBS) suggestions on capital accord are important guiding frameworks for the regulatory capital requirement to the 18 banking enterprises everywhere in the world and Nepal is no exception. Realizing the significance of capital for ensuring the safety and soundness of the banks and the banking system, at large, Nepal Rastra Bank (NRB) has developed and enforced capital adequacy requirements based on worldwide practices with an appropriate level of customization based on the domestic state of marketplace developments.

2.1.3 Eligible capital and their components

Qualifying capital in the context of financial institutions normally banks consists of Tier 1 (core) capital and Tier 2 (supplementary) capital elements, net of required deduction in the capital. Thus, for the purpose of calculation of regulatory capital, banks are required to classify their capital into two parts (Basel report-2005). In order to calculate the minimum capital requirement of a bank, all capital components should be segregated into these two parts as follows:

Core Capital (Tier-1)

Nepal Rastra Bank has issued directives regarding the minimum capital requirements for banks. Every bank has to comply with the directive of Nepal Rastra Bank. Bank has to maintain 4.5% equity capital, 6%Tire I capital, and 8.5% minimum total capital of total risk-weighted exposure. In Nepal, a commercial bank should maintain a capital fund at 8.5% of the risk-weighted assets, in which at least 6% of the risk-weighted assets must be Tier I capital. The key element of capital on which the main emphasis should be placed on tier 1 capital, which consists of equity capital and disclosed reserves. It includes fully paid ordinary shares/common stock and non-cumulative

perpetual preferred stock (but excluding cumulative preferred stock). This emphasis on equity capital and disclosed reserves reflects the importance to secure progressive enhancement in the quality, as well as the level, of the total capital resources maintained by major banks. Notwithstanding this emphasis, there are a number of other important and legitimate constituents of a bank's capital base, which are included within the system of measurement. Individual supervisory authorities are free at their discretion to apply a policy of deduction on a case-by-case basis. For supervisory purposes, it has been defined in two tiers in a way which have the effect of requiring at least 50% of a bank's capital base to consist of a core element comprised of equity capital and published reserves. The other element of capital (supplementary capital) is admitted to an amount equal to that of the core capital. Tier-1 capital, or core capital, consists of equity capital, ordinary share capital, intangible assets, and audited revenue reserves. Tier-1 capital is used to absorb losses and does not require a bank to cease operations. Tier-1 capital is the capital that is permanently and easily available to cushion losses suffered by a bank without it being required to stop operating. A good example of a bank's tier one capital is its ordinary share capital.

Elements of core capital

- Paid up Equity Capital
- Irredeemable non-cumulative preference shares (fully paid-up)
- Eligible capital funds
- Share Premium (Paid-in capital)
- Proposed Bonus Equity share
- General Reserve
- Disclosed
- Retained earnings available for distribution to shareholders.
- Un-audited current years cumulative profit
- Capital Redemption reserve
- Capital Adjustment reserve
- Dividend equalization reserve

Any other type of reserves notified by NRB

Eligible deductions from core capital

For capital adequacy purpose banks can deduct some items from the capital components as being fully risk free and thus subject to no capital requirements. The items are as follows:

- Book value of goodwill
- Miscellaneous expenditure to the extent not written off, e.g., preliminary expenses, share issue expenses, deferred revenue expenditure, etc.
- Investment in equity of institutions in excess of prescribed limits.
- Fictitious assets
- Investment in securities of companies having financial interest of the concern bank
- Investments arising out of underwriting commitments that have not been disposed within a year from the date of commitment.
- Reciprocal crossholding of bank capital artificially designed to inflate the capital position of the bank.
- Any other items as stipulated by Nepal Rastra Bank

We can calculate Core Capital Ratio by using a formula are as given bellows:

$$\text{Core capital ratio} = \frac{\text{Core Capital}}{\text{Total risk weighted exposure}} \times 100\%$$

Supplementary Capital (Tier-2)

The Supplementary (Tier 2) Capital includes reserves that have been passed through the profit and loss account and all other capital instruments eligible and acceptable for capital purposes. Elements of the Tier 2 capital will be reckoned as capital funds up to a maximum of 100% of Tier 1 capital arrived at, after making regulatory adjustments/deductions. In case, where the Tier 1 capital of a bank is negative, the Tier 2 capital for regulatory purposes shall be considered zero, and hence the capital fund, in such cases, shall be equal to the core capital.

Tire-2 Capital comprises unaudited retained earnings, unaudited reserves, and general loss reserves. This capital absorbs losses in the event of a company winding up or liquidating. Tier-2 capital is the one that cushions losses in case the bank is winding up, so it provides a lesser degree of protection to depositors and creditors. It is used to absorb losses if a bank loses all its Tier-1 capital.

The two capital tiers are added together and divided by risk-weighted assets to calculate a bank's capital adequacy ratio. Risk-weighted assets are calculated by looking at a bank's loans, evaluating the risk, and then assigning a weight. When measuring credit exposures, adjustments are made to the value of assets listed on a lender's balance sheet. All of the loans the bank has issued are weighted based on their degree of credit risk.

Elements of tier-2 capital

Tier II Capital is also known as the supplementary capital of banks. Loan loss reserves, cumulative and redeemable preferred shares, perpetual debts, hybrid capital instruments, capital equity notes, and subordinated debts are the elements of supplementary capital. Capital equity notes are the mandatory convertibles that can be exchanged for common stock. Supplementary capital should not exceed the amount of core capital. The total capital fund of a bank is the sum of core capital and supplementary capital.

The Tier 2 capital consists of the sum of the following elements:

- Preference Share Capital Instruments [Perpetual Cumulative Preference Shares (PCPS) / Redeemable Non-Cumulative Preference Shares (RNCPS) / Redeemable Cumulative Preference Shares (RCPS)] issued by the bank with the maturity of 5 years or above;
- Subordinated term debt fully paid up with a maturity of 5 years or above;
- Hybrid capital instruments combine certain characteristics of debt and certain characteristics of equity.
- Stock surplus (share premium) resulting from the issue of instruments included in Tier 2 capital;
- General loan loss provision is limited to a maximum of 1.25% of total Credit Risk Weighted Exposures.
- General loan loss provision refers to provisions or loan-loss reserves held against future, presently unidentified losses are freely available to meet losses that subsequently materialize.
- Exchange equalization reserves are created by banks as a cushion for unexpected losses arising out of adverse movements in foreign currencies.
- Investment adjustment reserves are created as a cushion for adverse price movements in banks‟ investments falling under the "Available for Sale" category.

- Revaluation reserves will be eligible up to 50% for treatment as Tier 2 capital and limited to a maximum of 2% of total Tier 2 capital subject to the condition that the reasonableness of the revalued amount is duly certified by the internal auditor of the bank.
- Any other type of instruments notified by NRB from time to time for inclusion in Tier 2 capital.

Less: Regulatory adjustments/deductions applied in the calculation of Tier 2 capital

As supplementary capital contains all the quasi capital components which are subject to risk, there is no provision for eligible deductions from such capital. Moreover, the amount of Tier-2 capital is limited to up to 100% of the sum total of the Tier-1 capital net of deductions.

Capital funds

The capital fund is the summation of Tier 1 and Tier 2 capital and Tier 1 capital is the total of common equity Tier 1 and additional Tier 1 capital. A bank should compute capital ratios in the following manner:

$$\text{Tire1 capital ratio} = \frac{\text{Tire 1 capital}}{\text{Total risk weighted Assets}}$$

$$\text{Capital adequacy ratio} = \frac{\text{Total Capital fund (tire 1+Tir 2)}}{\text{Total risk weighted assets}}$$

2.1.4 Risk-weighted assets (RWA)

The Basel Capital standards consider the credit risk on a bank's assets. For this purpose, risk weights are assigned to each asset of the bank on the basis of the risk inherent in each asset. There are several credit risk classifications for banks. NRB has classified assets into different risk classes and assigned a weight to each class. The risk weights assigned are: 0%, 20%, 50%, 60%, 75%, 100%, 150% and 200%. Risk weight shows the capital required to support the bank assets. The risk-weighted assets by multiplying the book value of assets by the risk weight assigned to the respective assets.AS per the Basel Accord 2009, the items which are not recorded in the balance sheet also explore risk to the bank, and such items are called off-balance sheet items. The total risk-weighted assets are the summation of total risk-weighted on balance sheet items and total risk-weighted off-balance sheet items.

Risk-weighted assets are used to determine the minimum amount of capital that must be held by banks and other financial institutions in order to reduce the risk of insolvency. The capital requirement is based on a risk assessment for each type of bank asset. According to Basel III, a set of international banking regulations sets the guidelines around risk-weighted assets. Risk coefficients are determined based on the credit ratings of certain types of bank assets. Loans backed with collateral are considered to be less risky than others because the collateral is considered in addition to the source of repayment when calculating an asset's risk.

Table 1

Risk weighted off balance sheet items

Off Balance Sheet Exposure	Risk Weight
Any commitments those are unconditionally cancelable at any time by the bank without prior notice (for example bills under collection)	0%
Forward exchange contracts.	10%
Short Term Trade-related contingencies. This includes documentary letters of credit, acceptances on trade Bills, Shipping guarantees issued and any other trade-related contingencies with an original maturity up to six months.	20%
Undertaking to provide a commitment on an off-balance sheet items	20%
Unsettled13 securities and foreign exchange transactions between bank to bank and between bank and customer	20%
Long Term Trade-related contingencies. This includes documentary letters of credit, Acceptances on trade Bills, shipping guarantees issued and any other trade-related contingencies with an original maturity of over six months.	50%
Performance-related contingencies, Contingent liabilities, which involve an obligation to pay a third party in the event that counterparty fails to fulfill. This includes issue of performance bonds, bid bonds, warranties, indemnities, underwriting commitments and standby letters of credit in relation to a non-monetary obligation of counterparty under a particular transition.	50%
Long term irrevocable Credit Commitments. (Un-drawn portion of committed credit more than 1 year). This shall include all unutilized limits of working capital loans e.g. overdraft, cash credit, working capital loan etc. except for	Up to 50%

trade finance exposures.	
Short term irrevocable Credit Commitments (un-drawn portion of committed credit up to 1 year). This shall include all unutilized limits e.g. overdraft, cash credit, working capital loan etc. except for trade finance exposures.	20%
Repurchase agreements, securities lending, securities borrowing, reverse repurchase agreements and equivalent transactions.	100%
Direct credit substitutes, Any irrevocable off-balance sheet obligations which carry the same credit risk as a direct extension of credit. This includes potential credit arising from the issue of financial guarantees and credit derivatives, confirmation of letters of credit, issue of standby letters of credit, and bills endorsed under bill endorsement lines Unpaid portion of partly paid shares and securities.	100%
Unpaid Portion of party paid Shares and Securities	100%
Other Contingent Liabilities	100%

Source: www.NRB Directive.com (2019)

Table 2

Risk weighted on balance sheets assets

On Balance Sheet Exposure	Risk Weight
Cash Balance	**0%**
Gold(Tradable)	0%
Balance with Nepal Rastra Bank	0%
Investments in Bonds and Share	0%
Balance with domestic and financial institutions	20%
Balance with foreign Banks	20%
Money at call	20%
Loans provided against the guarantee of Rated licensed foreign institutions	20%
Investments in Share, Debenture and Bonds	50%
Investment in public (government owned) Enterprise	50%

Other investments	50%
Loan, Advances and Bill purchased Discounted	50%
Fixed Assets	50%
All other assets	50%

Source: NRB Directives.com (2019)

Minimum capital requirement

According to the Capital Adequacy Framework 2015 Commercial bank need to maintain certain percentage of capital adequacy ratio given as below:

- Banks shall maintain a minimum total capital (MTC) of 8.5% of total risk weighted assets (RWAs) i.e. capital to risk weighted assets (CRAR).
- Common Equity Tier 1 (CET1) capital must be at least 4.5% of risk- weighted assets (RWAs) i.e. for credit risk + market risk + operational risk on an ongoing basis.
- Tier 1 capital must be at least 6% of RWAs on an ongoing basis. Thus, within the minimum Tier 1 capital, Additional Tier 1 capital can be admitted maximum at 1.5% of RWAs.
- Total Capital (Tier 1 Capital plus Tier 2 Capital) must be at least 8.5% of RWAs on an ongoing basis. In case the Tier 1 capital is negative, Tier 2 capital shall be considered to be "Nil" for regulatory capital adequacy purposes and hence, in such a situation, the capital fund shall be equal to the Tier 1 capital.

2.2 Review of literature on the capital adequacy and return on asset

Capital adequacy rules are safety valve for regulators and banks' clients/shareholders to reduce expected risks faced by commercial banks especially for cross border transactions as these rules are applied compulsory by all banks internationally. Applying these rules will achieve rational management and governance (El-Ansary & Hafez; 2015). Capital adequacy ratio (CAR) is an important indicator of bank safety sustainability. Banks that can guarantee CAR means the bank has the power to resist the financial crisis, protecting the bank itself and funds from depositors (Usman et al. 2019). Thus, to explain different researches expose in the different part, the following review of literature are as below;

Table 3

Review of literatures on capital adequacy and return on asset

Studies	Major findings
Dutta and Mahmud (2018)	Positive relationship between capital adequacy ratio (CAR) and return on asset (ROA).
Kingu et al. (2018)	Positive and statistically significant with ROA as the ratio of CAR increases, the ROA of banks moves upward.
Srivastava and Bhowmick (2017)	Profitability has shown the decreasing trends on ROA and it's no significant impact on CAR.
Ojong and Ubi(2014)	CAR has play a important role in ROA. It has no any significant impact on profitability
Irawan et, al. (2015)	No any significant impact on the capital adequacy ratio and return on asset.
Baral (2016)	CAR has positive significant relationship between ROA.
Mekonnen (2015)	Positive relationship between CAR and ROA. It is significant impact on profitability
Khalid (2011)	No significant impact on the CAR and ROA
Patwary and Tasneem (2019)	No significant impact between CAR and ROA as there exist independent causality.

Irawan and Anggono (2015) have examined the determinants of capital adequacy ratio of Bank BUKU 3 and Bank BUKU 4 in Indonesia. Determinants and its effect toward capital adequacy ratio of Indonesian banks are covered by the study. Data were gathered from monthly financial statement of Indonesian banks during 2005-2014. Regression analysis was used in this study to analyze the relationships between independent variables; bank size (asset), deposits, credits, nonperforming loan, liquidity coverage ratio (LCR), profitability (ROA and ROE), and net interest margin (NIM) and a dependent variable which is capital adequacy ratio (CAR). The results of this study were assets, nonperforming loan, and ROA have positive effect toward the capital adequacy ratio, while ROE, NIM, credit, and deposit have negative effect toward the dependent variable. On the other hand, liquidity coverage ratio not has any significant effect toward the capital adequacy ratio.

Khalid (2011) found in his study on "The impact of capital adequacy requirements on the profitability of private banks in India (A case study of J and K Bank, ICICI Bank, HDFC Bank, and Yes Bank) found that there was no significant impact of capital adequacy, non-interest income and net interest income on the profitability of the private commercial banks. Various financial ratios employed along with regression suggest that the null hypothesis stands committed. The study further finds out that the non-risk weighted capital adequacy measures (i.e. equity capital ratio) are negatively related to the profitability of a bank.

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 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 incensement 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 ad 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 an increase in CAR enables ROA to move towards upward.

Ojong and Ubi (2014) in their work on the impact of capital adequacy on deposit money bank's profitability in Nigeria revealed that capital adequacy plays an important role in explaining a bank's Return on Assets (ROA) which is a measure of bank profitability.

Mekonnen (2015) examined the determinants of commercial banks of Ethiopia commercial banks. This study found that the fixed effect model for the study reveals that ROA, DEP, and SIZE have a positive effect on capital adequacy and ROE and NIM have a negative effect on capital adequacy but Loan to assets and Leverage ratio have no significant effect on capital adequacy.

Baral (2016) conducted a study on 20 commercial banks from the fiscal year 2006/07 to 2012/13 leading to a total of 160 observations and revealed that has size, operational efficiency, and return on assets have a positive relation with capital adequacy ratio which implies that higher the size, operational efficiency and return on assets, higher would the capital adequacy ratio. The result also shows that customer deposits and loans and advances have a negative relation with both the capital adequacy ratio.

Datta and Mahmud (2018) found that the regulatory capital held by banks is greater than the minimum capital requirement guided under the Basel II accord. It has been shown that explanatory variables like capital adequacy, operating efficiency, and loan and structure are positively related to the profitability of a bank.

Srivastava and Bhowmick (2017) observed the impact of the capital adequacy ratio under Basel II on the determinants of profitability ratios of Panjab national bank. The research observed the impact of capital adequacy ratio correlation and regression analysis show a positive relationship between all the profitability ratio and capital adequacy ratio expected earnings per share. The profitability ratio like dividend payout ratio and return on equity have shown a decreasing trend during the Basel II period whereas ratios like Return on assets, Earning per share and Dividend Payout Ratio have not shown a consistent decrease.

Patwary and Tasneem (2019) researched to evaluate the impact of the non-performing loan on the profitability of banks in Bangladesh. The research discover 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 year's 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 weld 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.

2.2.1 Review of literature on capital adequacy and return on equity

Capital adequacy is the quantity of capital a financial institution and the different economic group has to keep as required with the aid of using its economic regulator. To create a sound and healthy economic machine, sensible and green law is important. The economic quarter is ordinarily the way for shifting and reworking the saving of a financial system into its funding (Hadjixenophontos et al. 2018).

Table 4

Review of literature on capital adequacy and return on equity

Studies	Major finding
Navapan and Tripe (2003)	It is Negative relationship between capital adequacy ratio (CAR) and return on asset (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.
Zaman et al. (2011)	Positive significant relationship between capital adequacy ratio (CAR) and return on equity (ROE).
Dutta and Mahmud (2018)	Positive relationship between capital adequacy ratio (CAR) and return on equity.

Navapan and Tripe (2003) asserted that the proportion that there has to be a negative relationship between a bank's ratio of capital to assets and its return on equity may appear to be self-evident as to not need empirical verification. It is consequently important to note that Berger (1995) found evidence for a positive relationship that is, the ratios of capital to assets and returns on

equity have been positively related. He argued that a higher capital ratio (with decreased risk of bankruptcy) should reduce a bank's cost of funds, both by reducing the rate of the fund and the quality of funds required, thus improving a bank's net interest income and hence profitability.

Dutta and Mahmud (2018) referred to Capital as consisting of equity and long-term debts and considered a source of funds to the banks along with deposits and borrowings. In measuring the profitability of a bank, the regulators have used Return on Assets (ROA) and Return on equity (ROE) to access the performance of the bank. These two are used as inputs in statistical models to find out the bank's failures and mergers and other purposes which need measuring profitability. The study establishes that the change in total assets is also significant. Thus the present examination has included those variables in its model to examine the relationship between capital adequacy, cost-income ratio, and profitability. In measuring the profitability of a bank, bank regulators and analysts have used Return on Assets (ROA) and Return on Equity (ROE) to assess industry performance and forecast trends in market structure as inputs in statistical models to predict bank failures and mergers and for a variety of other purposes where a measure of profitability is desired.

Zaman *et al.* (2011) show a significant relationship between bank profitability and capital adequacy. The results suggest that all variables have a significant relationship with bank profitability, although their impacts and relationships are not always uniform for domestic and foreign banks. But, the findings under the primary data analysis show that there is no significant relationship between capital adequacy and profitability in both the domestic and foreign banks in the Nigerian banking sector.

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 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 positive significant relationship whereas the effects return on equity is negative and there exists a negative and significant relationship.

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. 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.

2.2.2 Review of literature on non-performing loan and (ROA) & (ROE)

The bank's asset is another bank specific variable that affects the profitability of a bank. The bank asset includes among others current assets, credit portfolio, fixed assets, and other investments (Athmanasoglous 2006). The quality of loan portfolio determines the profitability of banks. The loan portfolio quality has a direct bearing on bank profitability. The highest risk facing a bank is the losses derived from delinquent loans (Dang, 2011). The non-performing loan ratios are the best proxies for asset quality. This ratio portrays the bank's ability to keep the risk of loan repayment by the debtor. After credits are given, banks should monitor the use of the credits as well as the debtors' ability and compliance to meet their obligations cause if there is a failure of the debtor to pay, it will decrease bank's profitability. Frederick (2014) proved that the NPL has a significant negative effect on profitability. But Duraj & Moci (2015) proved that the NPL has no significant effect on profitability.

Table 5

Review of literature on non-performing loan and (ROA) & (ROE)

Studies	Major Findings
Goddard and Haron (2013)	Positive relationship between non-performing loan and ROA & ROE.
Alajmi and Alqasem (2015)	The non-performing loan and return on equity has no any significant relationship between NPL and ROE.
Lucky and Nwosi (2015)	The percent of non-performing loans have positive relationship with Return on equity.
Maheshwari et, al. (2018	Inverse relationship between NPA and ROA & ROE it's statistically significant.
Munene (2006)	There is weak positive relationship between two variables ROA and ROE.

Alajmi and Alqasem (2015) have identified the effects of seven internal factors of five conventional Kuwaiti banks on capital adequacy ratio (CAR). The five factors are: Loans to Assets, Loans to Deposits, Non- Performing Loans to Total Loans, Return on Assets, Return on Equity, Dividend Payout and Total Liability to Total Assets. The study covers the period from 2005 to 2013. The study shows that under fixed effect model, variables DIVIEDEND, LAR, LDR, NPLLR, and ROE do not have any impact on capital adequacy ratio. However, SIZE has a significant and negative relationship with capital adequacy ratio. Also, ROA shows a significant and negative relationship with capital adequacy ratio. Under random effect model, results indicate that CAR is adversely affected by bank's SIZE (total liability to assets), and ROA has a significant and negative relationship with capital adequacy ratio. However, Loan to Deposit Ratio (LDR) showed a significant and positive relationship with capital adequacy ratio. On the other hand, dividend payout, loans to assets, Non-Performing Loans to Total Loans and Return on equity do not have significant effect on CAR under random effect model.

Goddard (2004) investigated the profitability of Euro peon banks using cross-sectional data during the 1990s. The results showed the relationship between the capital-asset ratio and profitability is positive. In another study, Wilson et al. (2004) measured the impact of some of

the determinants of profitability. The factors such as liquidity, deposit items, asset structure, inflation, and money supply had a significant long-term impact on profitability.

Maheshwari et, *al.* (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 NPL 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 a bank's profitability. The regression results found that net NPL has negative impact on the profitability of IFCI and no impact of NPA on the profitability of IDBI.

Lucky and Nwosi (2015) found a study on assets quality and profitability of commercial banks in Nigeria. This study tested the connection between asset excellence and the profitability of the fifteen quoted commercial banks in Nigeria from 1980 – to 2013. The objective of the study was to research the connection between CAMELS standards for asset quality and the profitability of Nigerian commercial banks. Secondary statistics had been sourced from annual reviews of the quoted commercial banks. The Findings from the regression result proved that the percent of non-performing loans to Total Loans and percent of nonperforming Loans 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.

Munene's (2006) analysis of the study was to ascertain whether there exists a relationship between the profitability of a firm and sources of financing of these firms quoted at the NSE. He found that there was a weak positive relationship between the two variables with a conclusion that profitability on its own is a minor determinant of capital structure.

2.2.3 Review of literature on liquidity ratio and (ROA) & (ROE)

A liquidity ratio is a type of financial ratio used to determine a company's ability to pay its short-term debt obligations. The metric helps determine if a company can use its current, or liquid, assets to cover its current liabilities. Three liquidity ratios are commonly used – the current ratio, quick ratio, and cash ratio. In each of the liquidity ratios, the current liabilities amount is placed in the denominator of the equation, and the amount of the liquid assets are placed in the numerator. Liquidity is the ability to convert assets into cash quickly and cheaply (Al-Tamimi and Obeidat 2013).

Table 6

Review of literature on liquidity ratio and ROA & ROE

Studies	Major finding
Mohapatra (2018)	Positively insignificant relationship exists between LQR and ROA & ROE.
Gizaw et al. (2015)	LQR ratio, the ratio of total loans to deposit has no statistically significant relationship with ROA & 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. 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 LQR and ROA & 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 ROA and ROE.

Mohapatra (2018) conducted a study on the liquidity ratio and profitability of 37 commercial banks in India using the panel data analysis over the period of 14 years i.e. 2005 to 2018. 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 LQR and 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.

2.2.4 Review of literature on credit to deposit ratio and (ROA) & (ROE)

The credit to deposit ratio of how much a bank lends out of the deposits. It indicates how much of a bank's core funds are being used for lending, the main activity. A high ratio indicates more reliance on deposits for lending and likely pressure on resources. The credit to deposit ratio is the ratio of how much a bank lends out of the deposits it has mobilized. Credit means loans given out to borrowers by the banks. Credits are assets of the Bank (Alkadamani 2015). Deposits are the amount received from customers as deposits in the banks. The major review of literature on credit to deposit ratio and ROA & ROE as bellow;

Table 7

Review of literature on credit to deposit ratio and (ROA) & (ROE)

Studies	Major findings
Sharifi & Akhter (2016)	There exists statistically significant relationship between credit to deposit ratio (CDR) and ROI, ROA, OPTA. On the other hand return on equity (ROE) was found not to be statistically significant. ROE.
Jethwani et al. (2017)	Significant relationship between credit to deposit ratio (CDR) and return on asset (ROA) & return on equity (ROE).

Sharifi & Akhter, (2016) studied the impact of Priority Sector Advances on Banks Profitability by taking data of all schedule commercial banks from 2004 to 2014 and found that there exists statistically significant relationship between PSATA and ROI, ROA, OPTA, INTTA. On the other hand ROE was found not to be statistically significant.

Jethwani et al. (2017) observed that Impact of Credit Deposit Ratio (CDR) on Bank Profitability Evidence from Scheduled Commercial Banks of India. CD Ratio of all commercial banks taken

as an independent variables whereas, Return on Assets (ROA), Return on Investment (ROI), Return on Equity (ROE), and Ratio of net interest income to total assets (Net Interest Margin) were taken as dependent variables. The study covers the period ranging from financial year 2004-5 to 2015-16 and entire dataset was taken from Reserve Bank of India website. The study reveals that there exists a statistically significant relationship between CDR and OPTA, INTTA, ROE and NIM implying that Credit Deposit Ratio (CDR) has bearing on bank profitability.

2.2.5 Review of literature on Nepalese articles and journal

Gautam (2019) concluded that capital adequacy has helped in developing suitable prudential norms to save the banks and financial institutions from financial crisis and signals of failure. The dissertation further concluded that the operating environment of the bank has changed radically, and its risk management system has also improved. The return on assets was significantly influenced by the capital adequacy ratio, interest expenses to total loan, and net interest margin, while the capital adequacy ratio had a considerable effect on return on equity. This study aims at examining the effect of capital adequacy and operating efficiency on the performance of commercial banks in Nepal. It also examines the effect of capital adequacy on the operating efficiency of commercial banks in Nepal. The remainder of this study is organized as follows. Section two describes the sample, data, and methodology. Section three presents the empirical results and the final section draws conclusions and discusses the implications of the study findings.

Chalise (2019 Found that the regression models are expected to test the significance and impact of capital adequacy and cost income ratio at the performance of Nepalese commercial banks. The study indicates that there's positive relationship of financial institution size with return on assets. This indicates that larger the banks, higher will be the return on assets. However, the study shows that there is negative relationship of capital adequacy, cost income ratio, equity capital to total assets ratio and liquidity ratio with return on assets. This suggests that increase in capital adequacy ratio, cost income ratio, equity capital to total assets ratio and liquidity ratio leads to increase in return on assets. Similarly, the study discovered that higher the equity capital to total assets, decrease will be the return on assets. Similarly, the study observed that there's a negative relationship of cost income ratio and liquidity ratio with return on equity. This shows that higher the cost income ratio and liquidity ratio, lower will be the return on equity. The

regression results show that financial institution size has positive impact on financial institution overall performance. However, the study reveals that capital adequacy ratio, cost income ratio, and equity capital to total assets has negative impact on return on assets.

Khadka (2010) has conducted research entitled "NRB Unified Directives on Capital Adequacy Norms and its Impact, a case study of SCBL, NABIL, HBL, NIBL, and ADBL".It is found that the sample banks are up to the mark of Capital Adequacy guidelines of NRB. The banks are following directives but in cases of supplementary capital, there has been a shortfall, which can be compensated for the excess amount of core capital in supplementary capital. This study shows the significant impact of NRB directives of Capital Adequacy on the various aspects of the commercial Banks in the Financial Markets and to uplift the Banking sector in Nepal to international standards. It shows the increased provisioning amount has decreased the profitability of the commercial banks.

Pandit (2010) has conducted research entitled "Directives of NRB in maintaining Capital Adequacy Ratio and its impact, a case study of NIC Bank" that Capital Fund has grown consistently from 2061/62 to 2065/66 due to the substantial increment in the supplementary capital, and issuance of Unsecured Subordinated Term Debt. It shows Capital Deposit ratio is adequate and satisfactory. Although the capital adequacy requirement has been met, the Bank is unable to fulfill other capital and deposit ratio which are important to safeguard the depositors.

Pradhan and Shrestha (2016) observed a study on 17 commercial banks of Nepal for the period 2006 to 2013 and identified that Banks operating efficiency, loan and deposit, total deposit and total assets have a significantly positive impact on the financial performance of Nepalese commercial bank whereas, total capital ratio has a negative impact on the financial performance of Nepalese commercial bank.

Baral (2016) conducted a study on 20 commercial banks from the fiscal year 2006/07 to 2012/13 leading to a total of 160 observations and revealed that has size, operational efficiency, and return on assets have a positive relation with capital adequacy ratio which implies that higher the size, operational efficiency and return on assets, higher would the capital adequacy ratio. The

result also shows that customer deposits and loans and advances have a negative relation with both the capital adequacy ratio.

2.3 Research Gap

The above-studied subject matters have been carried out by different researchers. Since the weakness and drawbacks are also mentioned therewith. The study has covered only randomly sampled selected commercial banks in Nepal out of a total population of 27 commercial banks. Ten years of data have been analyzed with due consideration of capital adequacy ratio, non-performing loan, credit to deposit ratio, liquidity ratio and profitability indicators like return on assets and return on equity. Taking in mind for more elaborate and extensive analysis, a company-wise analysis has also been made. All the above studies have been conducted under the research title "Capita adequacy, liquidity and profitability of the commercial bank in Nepal". As to the research gap is concerned, there are many impacts on the capital adequacy on the profitability of the Nepalese commercial banks. Most of the studies have considered many more objectives which made their study more complicated but in this research report, only six objectives are taken into study. Secondary data have been considered in this research. Both financial tools like ROA and ROE as well as statistical tools like mean, standard deviation, correlation and regression analysis have been used in this research.

Many more studies are undertaken in the study area. This study adds more literature in the field so as to make the findings of the present studies more conclusive. This study is basically based on the capital adequacy indicators like capital adequacy, liquidity, credit to deposit and non-performing loan and profitability indicators like return on assets (ROA) and return on equity (ROE). It has been experienced that to date either sample has been limited to a single or more banks in an arbitrary manner, as a sample in order to draw a conclusion. Here the effort has been made to draw the nearest conclusion regarding the impact on the profitability in addition to ROA and ROE. Mostly the study related to bank profitability is based on various and broad indicators including capital adequacy with asset quality, management, earnings, and liquidity but very few studies are done in terms of one particular indicator on profitability performance so it is unique in this sense also.

CHAPTER III
RESEARCH METHODOLOGY

Research methodologies used by the researcher are presented in this study. It includes research design, population, sampling methods, sample size, data collection instruments, and processing procedures.

3.1 Research design

This study is about the capital funds of commercial banks taking the data and information of selected Nepalese commercial banks. Descriptive analysis research design is used to explore the various facts and figures. The research design in this study is basically descriptive and analytical. Ratio analysis and correlation analysis have been used for analyzing the data. The research examines the relationship between bank capital adequacy and profitability indicators with return on assets (ROA) and return on equity (ROE). This study uses descriptive and analytical research design, in order to examine the impact of capital adequacy on the profitability of a commercial bank in the case of Nepal from the fiscal year 20011/12 to 2020/21. Descriptive research design helps to describe the characteristics of variables and involves the evaluation of facts and information. The descriptive study defines a subject by constructing a profile of people, groups, or events through tabulation and the collection of data on the frequencies of studied variables. Various ratio analytical tools such as Correlation and regression are used to examine the performance of the banks.

3.2 Population and sample

The sample size of a survey is the total number of complete response that was received during the survey process. It is referred to as a sample because it does not include full target population; it represents a selection of the population (Daniel, Wayne W, 1999). Since the study is concerned with the effects of dividend on share price of commercial banks in Nepal. All the licensed commercial banks that are operating currently are the population of the study. For the purpose of this study, random sampling technique is used where the adequacy of sample from total

population were calculated by using the sampling calculator at 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.

There are 27 commercial banks operating in Nepal with their branches located in different parts of the country. According to sampling calculator 10 samples are adequate for the study, while 12 samples are actually used for the study. This study has covering the period from 2011/12 to 2020/21 using the Random sample technique. This sample comprises 44.44% of the total population of commercial banks in Nepal. The sample banks are presented in Table 8

Table 8

Name list of random selection on commercial bank

Name of Bank	**Established Year**
Himalayan Bank Limited	(1993 A.D)
Nepal SBI Bank Limited	(1993 A.D)
Everest Bank Limited	(1994 A.D)
Nepal Credit and Commerce Limited	(1996 A.D)
Machhapuchre Bank limited	(2000 A.D)

Kumari Bank Limited	(2001 A.D)
Nabil Bank Limited	(1984 A.D)
Laxmi Bank Limited	(2002 A.D)
Standard charter Bank Limited	(1987 A.D)
Nepal Investment Bank Limited	(1986 A.D)
Siddhartha Bank Limited	(2002 A.D)
Bank of Kathmandu Limited	(1995A.D)

3.3 Nature and source of data

The study is based on secondary data based. The data required for the study purpose has been collected from various secondary sources. The main sources of data are Nepal Stock Exchange (NEPSE) publications, Annual Reports of the selected banks and websites of the sample banks, and publications of Security Board of Nepal (SEBON) websites. The required data for this study such as balance sheets, profit and loss statements, etc. are collected through the annual report of the sample selected commercial banks and another structured document review. Mostly the annual reports of the selected sample banks and NRB reports are used as a major source of data. Besides the annual reports of sample banks, information is collected from various publications of the Nepal Stock Exchange (NEPSE), Nepal Rastrya Banks' official Site (NRB).To comply with the objective, the study is based on secondary data. The required data for this study such as balance sheets, profits, loss statements, etc. are collected through the annual report of the sample commercial banks and another structured document review.

Mostly the annual reports of the selected sample banks and NRB reports are used as a major source of data. Besides the annual reports of sample banks, information is supplemented from various publications of the Nepal Stock Exchange (NEPSE) and browsing of the official web site of sample banks, NRB and NEPSE.

3.4 Data collection and processing procedure

Different tools and techniques were adopted while collecting and processing data for the study. The data needed for conducting this study includes all the secondary sources. The degree of reliability and validity of the data used for the study depends on the degree of accuracy of the data maintained by the sample banks in their respective reports or accounts. However, the data

can be ensured by cross-checking the source. The data collected using the data collection sheet were edited, coded, and re-arranged as per the need of the study. Data are analyzed by using Microsoft Excel. The collected data are entered using analysis of descriptive, correlation, and regression is done as per the requirement of the study.

3.5. Method of analysis

The data collected from various sources are raw so they need to be classified and tabulate as per the nature of the study and in accordance with the data. Thus, different financial and tactical 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 Capital adequacy ratio, Non-performing loan, and Credit and deposit ratio whereas the tactical tools includes as listed are bellows:

Arithmetic mean or average

The mean or average value is a single value within the range of the data that is used to represent all the values in the series. Since an average is somewhere within the range of the data, it is also called a measure of central value. It is written by are as bellow

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

Where,

$\sum x$ = Sum of values of all items, and

N= Number of items

$\bar{X}$ = Arithmetic Mean

Standard Deviation (S.D)

The standard deviation is the measure that is most often used to describe variability in data distributions. It can be thought of as a rough measure of the average amount by which observation deviation on either side of the mean is denoted by Greek letters (read as sigma), standard deviation is extremely useful for judging the representatives of the mean. Standard Deviation is written by are as bellows

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

Where,

$\sum(X - \overline{X})^2$= Sum of squires of the deviations measured from arithmetic average

N= Number of items

Ϭ= Standard Deviation

Coefficient of variance (C.V)

The coefficient of variance is the ratio of standard deviation to the mean for a given sample used to measure spread. It can be thought of as the measure of relative risk. The larger the coefficient of variance, The greater the risk relative to the average. Mathematically it can be written by are as bellows:

$CV = \frac{6}{\bar{X}}$

Where,

CV= Coefficient of variation

Ϭ= Standard Deviation

$\overline{X}$ = Arithmetic Mean

Correlation of co-efficient analysis (r)

The correlation analysis is the technique used to measure the closeness of the relationship between the variables. Correlation is an analysis of the covariance between two or more variables and correlation analysis deals to determine the degree of relationship between variables. The correlation analysis can be written by the formula are as bellows

$r = \frac{Cov\ (X,Y)}{6_{X,6Y}}$

Where,

r = Coefficient of Correlation

Cov (X, Y) = covariance Between Stock X and Y

6_X = Standard Deviation of stock X

6_Y = Standard Deviation of stock Y

Regression analysis (r^2)

Pearson's correlation coefficient is a way to index the degree to which two or more variables Single Regression coefficient describes how the change in the independent variable affects the

value of the dependent variable estimate. This model is used as the econometrics model. As stated in the research design and methodology section, the study used four models to estimate the qualitative effect of the Capital Adequacy ratio on the profitability of Nepalese commercial banks measured by ROA, ROE and Average profitability ratio. An analysis where one or more than one independent variable is jointly regressed against the dependent variable is known as multiple regressions. The regression coefficient of each independent variable indicates the marginal relationship between the variables and the value of a dependent variable, the effect of all other independent variables in the regression model holding constant. This study is used to measure the degree of impact of capital adequacy requirements the on profitability of sample banks.

To access the profitability performance of banks from 2011/12 to 2020/21 a multiple regression equation. The Regression analysis can be written by formula are as bellows:

ROA = a + b1(CAR) + b2(NPL) +b3(CDR) + b4(LQR) + e …….(1)

ROE = a + b1(CAR) + b2(NPL) +b3(CDR) + b4(LQR) + e …… .(2)

In this analysis, the researchers have used a 5% level of significance to test the Hypothesis.

Whereas,

CAR= Capital adequacy ratio

NPL= Non-performing loan

CDR= Credit and deposit ratio

LQR= Liquidity ratio

ROA= Return on assets

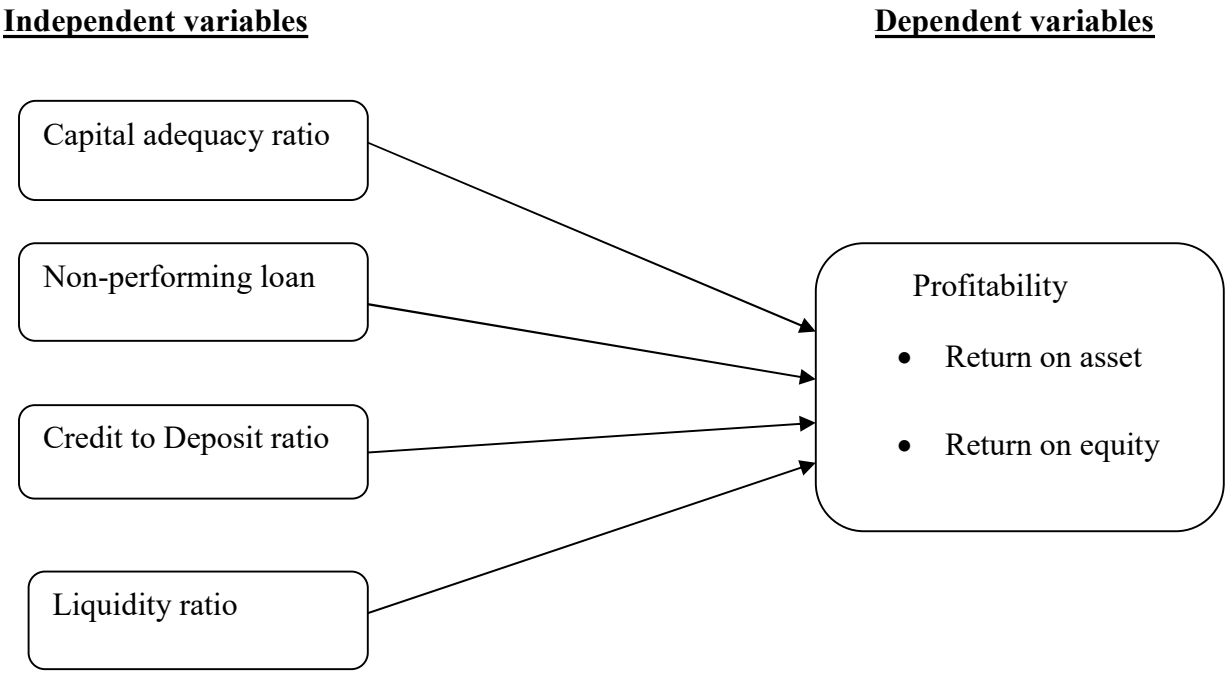
ROE= Return on equity

e = Random error term

3.5 Conceptual framework

Based on the review of the key paper by Srivastava and Bhowmick (2017) studied the impact of capital adequacy on Bank profitability under the Basel II accord" and Mekonnen (2015) "Determinants of Capital Adequacy of Ethiopia Commercial Bank (2004-2013), the following conceptual framework shows the relationship between dependent and independent variable. Five research hypotheses are developed to investigate the relationship among the variables that are

included in the framework. The hypothesis tests, if there is a significantly positive relationship between variables. The conceptual framework is shown in the figure below



Source: Mekonnen (2015), Srivastava and Bhowmick (2017)

Figure 1

Conceptual framework

3.5.1 Independent variable

Capital Adequacy Ratio (CAR)

The capital to risk-weighted ratio measures a bank's financial stability by measuring its available capital as a percentage of its risk-weighted credit exposure. The purpose of the ratio is to help bank protect their depositors and promote financial health. In Nepal, as per the capital adequacy framework 2015, all the commercial banks were required to maintain a CRAR of 8.5%, otherwise, the bank will be treated as undercapitalized. Higher the CRAR, lower the need for external funding and therefore higher profitability. It is also seen that well-capitalized banks face lower costs of going bankrupt and then the cost of funding is reduced. Berger et al. (1999) find a positive relationship between Bank Performance and Capitalization. The formula for the capital–to–risk-weighted Assets Ratio is given bellows:

$$CAR = \frac{\text{Total capital}}{Total\ Risk\ Weighted\ Assets} \times 100\%$$

Whereas,

Capital fund = Tier 1 capital + Tire 2 capital

Non-performing loan (NPL)

The bank's asset is another bank-specific variable that affects the profitability of a bank. The bank asset includes among others current assets, credit portfolio, fixed assets, and other investments (Athmanasoglous, 2006). The quality of a loan portfolio determines the profitability of banks. The loan portfolio quality has a direct bearing on bank profitability. The highest risk facing a bank is the losses derived from delinquent loans (Dang, 2011). The non-performing loan ratios are the best proxies for asset quality. This ratio portrays the bank's ability to keep the risk of loan repayment by the debtor. After credits are given, banks should monitor the use of the credits, as well as the debtors' ability and compliance to meet their obligations, cause if there is a failure of the debtor to pay, it will decrease the bank's profitability. Frederick (2014) proved that the NPL has a significant negative effect on profitability. But Duraj and Moci (2015) proved that the NPL has no significant effect on profitability. The formula for the capital–to–risk-weighted Assets Ratio is given bellows:

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

Credit to deposit ratio (CDR)

Abreu and Mendes (2011) observed that credit to deposit ratio of how much a bank lends out of the deposits. It indicates how much of a bank's core funds are being used for lending, the main activity. A high ratio indicates more reliance on deposits for lending and likely pressure on resources. The credit to deposit ratio is the ratio of how much a bank lends out of the deposits it has mobilized. Credit means loans given out to borrowers by the banks. Credits are assets of the Bank. Deposits are the amount received from customers as deposits in the banks. Deposits are a liability to the bank. So; the credit-deposit ratio broadly means the ratio of assets and liabilities of the banks. The credit-to-deposit (CTD) or loan-to-deposit ratio (LTD) is used for measuring a bank's liquidity by dividing the bank's total loans disbursed by the total deposits received

Khrawish (2011). It indicates how much of a bank's core funds are being used for lending which the main banking activity is. The formula for the credit to deposit Ratio is given bellows:

$$\text{Credit to deposit ratio} = \frac{\text{Total Advances}}{\text{Total Deposits}}$$

Liquidity ratio (LR)

Abreu and Mendes (2011) analyze that liquidity ratio is a type of financial ratio used to determine a company's ability to pay its short-term debt obligations. The metric helps determine if a company can use its current, or liquid, assets to cover its current liabilities. Three liquidity ratios are commonly used – the current ratio, quick ratio, and cash ratio. In each of the liquidity ratios, the current liabilities amount is placed in the denominator of the equation, and the amount of the liquid assets are placed in the numerator. Liquidity is the ability to convert assets into cash quickly and cheaply. Liquidity ratios are most useful when they are used in comparative form. This analysis may be internal or external. The deposit of a bank is called the cash reserve ratio Onadapo & Olufemi (2012). The formula for the credit to deposit Ratio is given bellows:

$$\text{Liquidity Ratio} = \frac{\text{Loan and advance}}{\text{total deposit}}$$

3.5.2 Dependent variable

Return on assets (ROA)

Return on assets is a financial ratio that shows the percentage of profit that a company earns in a relation to total assets. ROA is the key profitability of ratio which measures the amount of profit made by a company per dollar of its assets. The ratio measures the operating efficiency of the company based on the firm's generated profit from its total assets. Thus the higher ROA shows that the company is more efficient in using its resources. The performance of banks is measured through Return on Assets (ROA). It reflects the ability of the bank to generate profit from the bank's assets (Naceur, 2006). The ROA reflects the ability of a bank's management to generate profits from the bank's assets. It shows the profits earned per birr of assets and indicates how effectively the bank's assets are managed to generate revenues, although it might be biased due to off-balance-sheet activities. This is probably the most important single ratio in comparing the

efficiency and operating performance of banks as it indicates the returns generated from the assets that the bank owns (Tan et al. 2012). Using formulas are as shown bellows:

$$\text{ROA} = \frac{\text{Net Profit}}{\text{Total Assets}}$$

Return on equity (ROE)

Return on equity (ROE) is a percentage of net income /net profit on common equity. Its measures the ratio of return on the ownership interest (shareholders equity) of the common stock owners.ROE reflects the ability of the bank to use its own funds to generate profit in this study ROE is also used as the primary dependent variable to measure the bank's performance. The total capital fund of the sample bank is used as common equity in the calculation of ROE. Thus higher the ROE better the company in terms of profit generation. It reflects how effectively a bank is managing the shareholder's funds. This measured the net profits before tax divided by capital and reserves. It measures the earning power of shareholders' investments. Shareholders and investors will pay attention to this measure and will want to maximize it for their benefit. Return on equity is the return to shareholders on their equity. This means that return on equity reflects the capability of a bank in utilizing its equity to generate profits (Hyseni et al. 2015). It is further explained by Khrawish (2011) that ROE is the ratio of Net Income after Taxes divided by Total Equity Capital. It represents the rate of return earned on the funds invested in the bank by its stockholders. ROE reflects how effectively bank management is using shareholders' funds. Thus, it can be deduced from the above statement that the better the ROE the more effective the management in utilizing the shareholder's capital.

$$\text{ROE} = \frac{\text{Net Profit}}{\text{Total Equity capital}}$$

CHAPTER IV
RESULTS AND DISCUSSION

This chapter deals with the presentation, analysis, and interpretation of relevant data of EBL, HBL, NSBI, NABIL, BOKL, NCCB, KBL, LBL, SCB, NIBL, SBL, and MBL, Which were collected from various sources. This section is devoted to analyzing the structure and pattern of dependent variables i.e. return on assets and return on equity and independent variables capital adequacy ratio, non-performing loan, credit to deposit and liquidity ratio of random sample selected commercial banks for the period of FY 2010/11 to 2020/21. They are changed into an understandable presentation using financial, descriptive as well as statistical tools mentioned in the previous chapter i.e., Research methodology. This section tries to make a statistical analysis of the quantitative data for a better understanding of the impact of ratios on different factors of capital adequacy ratio. It is categorized into three parts i.e. Data presentation, Data analysis, and interpretation. This chapter contributes to highlighting the formulated objectives of the research study.

4.1 Descriptive analysis

The summary of the descriptive statistics for all variables used in the study is presented in table no 9. The table indicates the bank's profitability indicators like ROA and ROE. This table shows the relationship between the independent variables like capital adequacy, liquidity, non-performing loan and credit to deposit ratio individual dependent variable like ROA and ROE. It also shows the relationship between the Mean profitability ratios and independent variables. It helps to analyze the overall situation of selected banks. To provide a clear picture of profitability performance and capital adequacy indicators under the study, descriptive statistics are used. It clearly shows the average value, number of observation period, minimum value, maximum value and standard deviation of the variables of the sample commercial banks for ten year period.

Table 9

Descriptive statistics of variables

Variable	N	MAX	MIN	AVG	Std
Independent variable					
CAR	120	23.68	10.38	13.24	0.71
NPL	120	7.49	0.10	1.02	0.34
LQR	120	96.21	48.85	79.44	1.57
CDR	120	84.61	49.62	89.27	0.49
Dependent variable					
ROA	120	2.85	0.04	1.54	0.16
ROE	120	40.85	0.41	18.64	2.49
Mean profitability ratio	120	40.85	0.04	10.09	1.17

The table no 9 describe the descriptive different independent variable and dependent variable. The capital adequacy ratio shows the proportion of owner equity to total risk-weighted assets. Central banks use CAR as a protection of the deposits money from credit risk and other failures. With regard to the credit risk measured in Table no 9, it indicates that the average value of capital adequacy (CAR) is 13.24% with a standard deviation of 0.71%. The minimum capital adequacy ratio is 10.38% and the maximum is 23.68%. The average amount of capital adequacy ratio is higher than the minimum capital requirements of the Basel committee and the NRB directives 2015. It shows that the bank has the ability to bear losses resulting from loan default and other operational shocks. It indicates that the average value of the non-performing loan (NPL) is 1.02% with a standard deviation of 0.34%. The minimum non-performing loan is 0.1% and the maximum is 7.49% which is all selected commercial bank non-performing loan is maintained.

It indicates that the average value of liquidity ratio (LQR) is 79.44% with a standard deviation of 1.57%. The minimum liquidity ratio is 48.85% and the maximum is 96.21%. So, it indicates that all selected banks are less than a hundred percent. It indicates that the average value of credit to deposit (CDR) is 89.27% with a standard deviation of 0.49%. The minimum credit to deposit ratio is 49.62% and the maximum is 84.61%. It has maintained a credit to deposit ratio.

Return on Assets is an indicator of how efficient a company is using its assets to generate before contractual obligation must be paid. . ROA measures the ability of the management to convert the assets of the bank into net earnings (Zaman, 2008). The ROA reflects the ability of a bank's management to generate profits from the bank's assets. The mean value of ROA was 1.54%

during the period last ten years. It indicates, on average, the total assets f sample banks in Nepal generate 1.54% of return. The standard deviation on ROA is 0.16%. The maximum value of ROA is 2.85% and the minimum value is 0.04%. ROE is a financial ratio that refers to how much profit a company earned compared to the total amount of shareholder equity invested or found on the balance sheet. ROE is what the shareholders look for in return for their investment. The profitability performance measured by ROE showed that the average value of bank performance is 18.64%. The standard deviation of the ROE is 2.49%. The minimum and maximum value is 0.41% and 40.8% respectively.

4.1.1 Analyzing of Capital adequacy ratio

The capital adequacy ratio is the ratio that determines the capacity of the bank in terms of meeting the time liabilities and other risks such as credit risk, market risk, operational risk, and others. It is a measure of how much capital is used to support the bank's risk assets. The capital Adequacy Ratio (CAR) is calculated by dividing eligible regulatory capital by total risk-weighted exposure.

Table 10

Capital adequacy of sample commercial banks for the period of ten years

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	AVG
BOKL	11.07	12.58	11.57	13	13.67	13.97	15.07	14.58	14.09	14.02	13.36
EBL	11.02	11.6	11.15	13.33	12.67	14.69	14.2	13.75	13.23	12.51	12.82
HBL	11.02	12.15	11.58	11.45	10.91	12.23	13.03	12.73	14.67	13.85	12.36
KBL	11.94	12.23	11.92	11.12	12.02	16.15	13.93	12.07	14.42	13.71	12.95
LBL	11.68	12.27	12.12	10.95	11.15	14.02	12.54	11.33	12.46	11.85	12.04
MBL	15.04	12.66	10.38	12.47	12.23	17.48	15.6	12.88	13	12	13.37
NABIL	11.01	13.29	13.23	11.91	12.65	13.34	13.18	12.71	12.81	12.69	12.68
NCCB	11.77	11.95	11.58	11.43	11.8	12.3	11.38	14.04	13.4	13.8	12.35
NIBL	11.82	12.99	12.71	11.99	16.19	14.47	13.34	13.65	13.23	14.64	13.50
NSBI	11.43	12.86	12.2	13.47	13.33	15.76	15.26	14.01	15.44	13.93	13.77
SBL	11.54	12.3	12.27	11.19	11.12	13.21	12.43	12.56	12.97	13.45	12.30
SCB	14.37	14.48	14.3	13.86	15.82	22.04	23.68	19.9	18.54	17.17	17.41
AVG	11.98	12.61	12.08	12.18	12.79	14.97	14.47	13.69	14.02	13.63	
SD	1.27	0.72	0.97	0.97	1.65	2.59	3.03	2.07	1.59	1.35	
CV	0.11	0.06	0.08	0.08	0.13	0.17	0.21	0.15	0.11	0.09	
MIN	11.01	11.6	10.38	10.95	10.91	12.23	11.38	11.33	12.46	11.85	
MAX	15.04	14.48	14.3	13.86	16.19	22.04	23.68	19.9	18.54	17.17	

Source: Bank annual report and STATA

Capital adequacy is the reflection of the inner strength of the bank. In general, all sample banks maintain the CAR as directed by NRB. Higher capital adequacy indicates the stronger position of the bank. It ensures high safety against bankruptcy, however, very high capital adequacy also indicates that the bank is conservative and has not utilized the full potential of its capital. Table no 10 depicts that the average capital Adequacy ratio of the selected commercial bank is 13.24% with a standard deviation and coefficient of correlation of 0.71% & 0.44% respectively. As per the Capital Adequacy framework 2015, all commercial banks shall maintain a 10% of minimum capital Adequacy ratio. Alkadmani (2015) finds that a bank's profitability is negatively related to CAR. Ngo (2006) investigated the relationship between bank capital and profitability. It showed no significant relationship between capital and profitability.

4.1.2 Analyzing of Non- performing loan ratio

The bank's asset is another bank-specific variable that affects the profitability of a bank. The bank asset includes among others current assets, credit portfolio, fixed assets, and other investments.

Table 11

Non- performing loan of sample commercial bank for the period of ten years

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	AVG
BOKL	2.3	1.5	1.06	3.47	2.51	1.29	3.04	1.54	2.28	1.04	2.03
EBL	0.84	0.62	0.97	0.66	0.38	0.25	0.2	0.16	0.22	0.12	0.44
HBL	2.09	2.89	1.96	3.22	1.23	0.85	1.4	1.12	1.01	0.48	1.63
KBL	2.21	2.89	4.03	2.49	1.15	1.86	1.05	1.01	1.39	0.96	1.90
LBL	0.62	1.51	1.15	1.3	0.8	0.93	1.29	1.11	1.04	0.75	1.05
MBL	2.84	2.84	1.78	0.64	0.55	0.38	0.44	0.37	0.52	0.62	1.09
NABIL	1.77	2.26	2.13	2.25	1.14	0.8	0.55	0.74	0.98	0.84	1.35
NCCB	3.82	2.73	2.8	2.75	1.93	7.49	3.87	2.78	2.86	1.76	3.28
NIBL	3.32	1.91	1.77	1.25	0.68	0.83	1.36	2.78	2.91	2.46	1.93
NSBI	0.54	0.37	0.26	0.19	0.14	0.1	0.2	0.2	0.23	0.23	0.25
SBL	1.52	2.39	2.75	1.8	1.47	1.3	1.09	0.75	1.38	1	1.55
SCB	0.78	0.77	0.48	0.34	0.32	0.19	0.18	0.15	0.44	0.96	0.46
AVG	1.89	1.89	1.762	1.69	1.03	1.36	1.22	1.06	1.27	0.93	
SD	1.04	0.89	1.03	1.09	0.67	1.92	1.11	0.88	0.91	0.61	
CV	0.55	0.47	0.59	0.64	0.65	1.41	0.91	0.83	0.72	0.65	
MIN	0.54	0.37	0.26	0.19	0.14	0.1	0.18	0.15	0.22	0.12	
MAX	3.82	2.89	4.03	3.47	2.51	7.49	3.87	2.78	2.91	2.46	

Source: Bank annual report and STATA

Table 11 depicts that the average non-performing loan of the selected commercial bank is 1.02% with a standard deviation and coefficient of correlation of 0.34% & 0.33% respectively. The quality of a loan portfolio determines the profitability of banks. The loan portfolio quality has a direct bearing on bank profitability. The highest risk facing a bank is the losses derived from delinquent loans (Dang, 2011).

4.1.3 Analyzing of credit to deposit ratio

Credit to deposit ratio of how much the bank lends out of the deposits. It indicates how much of a bank's core funds are being used for lending, the main activity. A high ratio indicates more reliance on deposits for lending and likely pressure on resources (Ubi et al. 2014).

Table 12

Credit to deposit of the sample commercial bank for the period of ten years

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	AVG
BOKL	77.3	83.21	84.61	84.61	78.76	75.34	76.3	75.8	70.79	77.78	78.45
EBL	73.22	71.84	75.06	66.63	73.52	82.32	75.98	75.07	68.57	72.5	73.47
HBL	75.36	72.41	70.87	73.51	77.27	79.07	77.02	75.59	66.85	76.77	74.47
KBL	76.27	75.19	77.37	74.66	74.31	78	76.54	78.32	75.85	81.01	76.75
LBL	72.32	72.92	72.05	75.06	76.21	71.76	77.07	77.13	71.77	79.66	74.59
MBL	74.62	72.37	73.29	72.51	76.26	76.58	76.13	76.98	73.81	80.12	75.27
NABIL	77.91	74.42	77.51	65.12	73.84	75.62	74.68	72.9	68.08	79.22	73.93
NCCB	78.25	68.62	74.1	74.21	74.52	71.48	76.76	73.84	74.88	78.14	74.48
NIBL	75.3	73.6	76.94	72.76	75.74	77.63	75.01	71.97	72.93	75.12	74.70
NSBI	49.62	75.18	65.47	79.11	76.57	75	74.38	74.38	63.2	74.86	70.78
SBL	79.42	76.53	73.34	76.71	77.55	76.71	74.23	76.85	72.85	77.42	76.16
SCB	65.38	67.8	70.74	62.34	70.34	72.34	71.68	73.13	66.43	75.83	69.60
AVG	87.49	88.41	89.14	87.72	90.49	91.19	90.58	90.19	84.60	92.84	
S.D	16.56	15.21	15.53	15.75	15.24	15.5	15.17	15.14	14.58	15.65	
C.V	0.19	0.17	0.17	0.18	0.17	0.17	0.17	0.17	0.17	0.17	
MIN	49.62	67.8	65.47	62.34	70.34	71.48	71.68	71.97	63.2	72.5	
MAX	79.42	83.21	84.61	84.61	78.76	82.32	77.07	78.32	75.85	81.01	

Source: Bank annual report and STATA

Table 12 depicts that the average credit to deposit ratio of the selected commercial bank is 89.27% with a standard deviation and coefficient of correlation of 0.49% & 0.30% respectively.

4.1.4 Analyzing of liquidity ratio (LQR)

A liquidity ratio is a type of financial ratio used to determine a company's ability to pay its short-term debt obligations. The metric helps determine if a company can use its current, or liquid, assets to cover its current liabilities. This analysis may be internal or external. The deposit of a bank is called the cash reserve ratio (Onadapo & Olufemi, 2012).

Table 13

Liquidity ratio of sample commercial bank for the period of ten years

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	AVG
BOKL	72.28	78.72	79.07	80.61	86.43	84.83	90.48	91.17	87.98	95.2	84.68
EBL	72.74	76.24	72.21	66.05	73.43	82.2	81.75	85.89	82.02	83.87	77.64
HBL	71.82	74.71	68.65	72.26	76.58	81.18	87	87.51	81.84	88.94	79.05
KBL	81	79.32	82.66	80.86	79.26	86.79	90.08	90.27	94.59	93.27	85.81
LBL	69.41	73.74	71.49	73.55	80.66	85.4	91.48	89.36	89.61	92.93	81.76
MBL	74.37	79.72	78.69	76.39	83.73	86.74	88.81	86.92	88.56	86.53	83.05
NABIL	77.66	74.71	74.06	64.27	70.34	76.89	82.56	80.6	79.27	89.99	77.04
NCCB	78.06	73.53	80.18	79.77	81.64	81.6	85.06	87.95	88.51	91.16	82.75
NIBL	74.57	75.88	71.91	73.96	79.85	83.15	86.69	86.69	86.03	96.21	81.49
NSBI	49.5	49.47	64.34	76.83	71.98	76.08	89.61	90.78	85.42	95.63	74.96
SBL	77.31	81.32	77.87	81.32	85.84	86.38	84.65	88.59	87.36	89.46	84.01
SCB	51.09	58.6	56.84	48.85	56.88	62.2	69.28	72.77	58.04	75.62	61.02
AVG	70.82	72.99	73.16	72.89	77.22	81.12	85.62	86.54	84.10	89.90	
SD	9.68	8.84	7.06	8.99	7.89	6.65	5.77	4.95	8.77	5.59	
CV	0.14	0.12	0.09	0.12	0.1	0.08	0.07	0.06	0.1	0.06	
MIN	49.5	49.47	56.84	48.85	56.88	62.2	69.28	72.77	58.04	75.62	
MAX	81	81.32	82.66	81.32	86.43	86.79	91.48	91.17	94.59	96.21	

Source: Bank annual report and STATA

Table 13 depicts that the average liquidity ratio of the selected commercial bank is 79.77% with a standard deviation and coefficient of correlation of 1.57% & 0.21% respectively.

4.1.5 Analyzing of return on assets (ROA)

ROA is defined as the net profit divided by total assets. ROA measures the ability of the management to convert the assets of the bank into net earnings. The ROA reflects the ability of a bank's management to generate profits from the bank's assets. It shows the profits earned per birr of assets and indicates how effectively the bank's assets are managed to generate revenues, although it might be biased due to off-balance-sheet activities (Munene, 2012).

Table 14

Return on assets of sample commercial bank for the period of ten years

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	AVG
BOKL	2.04	1.84	1.29	0.76	0.91	1.49	2.69	1.85	1.33	1.13	1.53
EBL	1.93	2.21	2.17	1.56	1.5	1.69	1.2	1.71	1.27	0.86	1.61
HBL	1.88	1.62	1.46	1.32	1.88	2	2.06	2.09	1.61	1.66	1.76
KBL	0.97	0.96	0.95	0.88	1.65	1.02	1.35	1.29	0.8	1.01	1.09
LBL	1.32	1.42	1.26	0.81	1.16	1.18	1.14	1.49	1.17	1.02	1.19
MBL	0.04	0.5	1.08	1.21	1.42	1.73	1.32	1.51	0.97	1	1.08
NABIL	2.41	2.85	2.56	1.75	2.21	2.35	2.42	2.2	1.5	1.55	2.18
NCCB	0.99	1.4	1.37	1.25	1.89	0.76	1.94	1.67	1.14	0.92	1.33
NIBL	1.89	2.55	2.1	1.77	1.85	2.01	1.96	1.68	1.15	1.45	1.84
NSBI	0.8	1.17	1.47	1.75	1.63	1.49	1.78	1.89	1.12	0.67	1.38
SBL	0.98	1.37	1.79	1.38	1.54	1.25	0.94	1.5	1.16	1.17	1.31
SCB	2.73	2.59	2.51	1.97	1.9	1.76	2.5	2.58	1.67	1.2	2.14
AVG	1.49	1.71	1.67	1.37	1.63	1.56	1.78	1.79	1.24	1.14	
SD	0.74	0.69	0.52	0.39	0.34	0.44	0.56	0.35	0.24	0.28	
CV	0.5	0.4	0.31	0.28	0.21	0.28	0.31	0.19	0.19	0.25	
MIN	0.04	0.5	0.95	0.76	0.91	0.76	0.94	1.29	0.8	0.67	
MAX	2.73	2.85	2.56	1.97	2.21	2.35	2.69	2.58	1.67	1.66	

Source: Bank annual report and STATA

Table 14 describe the mean value of ROA was 1.54% during the period last ten years. It indicates, on average that the total assets of sample banks in Nepal generate 1.54% of return. The standard deviation on ROA is 0.16% and the coefficient value is 0.35% respectiely.

4.1.6 Analyzing of return on equity (ROE)

The ROE is measure the rate of return on the bank's shareholder's equity and it is calculated by dividing the bank's net income after tax by total equity capital which includes common and preferred stock, surplus, undivided profits, and capital reserve. ROE is a financial ratio that refers to how much profit a company earned compared to the total amount of shareholder equity invested or found on the balance sheet. ROE is what the shareholders look for in return for their investment. A business that has a high return on equity is more likely to be one that is capable of generating cash internally. Thus, the higher the ROE the better the company is in terms of profit generation. ROE reflects how effectively bank management is using shareholders' funds (Khrawish, 2011).

Table 15

Return on Equity of sample commercial bank for the period of ten years

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	AVG
BOKL	25.01	22.86	15.7	10.05	10.64	16.69	24.07	16.06	11.79	10.38	16.33
EBL	35.03	35.31	32.16	28.67	25.06	23.16	14.76	20.87	15.51	9.7	24.02
HBL	26.34	22.12	20.81	18.56	27.84	22.99	21.11	21.51	17.78	17.54	21.66
KBL	11.76	12.27	12.09	11.89	22.27	8.8	12.94	12.84	7.18	12.37	12.44
LBL	16.9	19.26	17.34	10.78	13.55	9.99	10.07	14.25	11.9	10.08	13.41
MBL	0.41	5.97	16.57	19.16	19.49	16.39	13.31	17.84	12.11	14.43	13.57
NABIL	37.68	40.85	35.84	28.64	32.48	23.8	29.15	22.89	13.82	13.52	27.87
NCCB	11.31	19.29	16.27	15.32	23.77	8.92	23.6	13.89	9.39	9.58	15.13
NIBL	25.54	32.91	27.45	24.73	16.7	18.21	19.16	15.32	10.39	12.76	20.32
NSBI	16.69	24.3	24.23	23.18	23.25	17.08	17.34	19.46	11.55	6.66	18.37
SBL	15.31	22.5	31.11	24.62	24.51	14	10.78	18.07	15.07	16.27	19.22
SCB	31.9	29.41	29.95	25.69	21.1	12.91	17.92	19.54	15.12	9.45	21.29
AVG	21.16	23.92	23.29	20.11	21.72	16.08	17.85	17.71	12.63	11.89	
SD	10.53	9.29	7.52	6.52	5.77	5.16	5.6	3.12	2.83	3.03	
CV	0.49	0.39	0.32	0.32	0.27	0.32	0.31	0.18	0.22	0.25	
MIN	0.41	5.97	12.09	10.05	10.64	8.8	10.07	12.84	7.18	6.66	
MAX	37.68	40.85	35.84	28.67	32.48	23.8	29.15	22.89	17.78	17.54	

*Source***:** Bank Annual Report and STATA

ROE is a financial ratio that refers to how much profit a company earned compared to the total amount of shareholder equity invested or found on the balance sheet. ROE is what the

shareholders look for in return for their investment. The profitability performance measured by ROE showed that the average value of bank performance is 18.64%. The standard deviation of the ROE is 2.49% and the coefficient is 0.42% respectively.

4.2 Correlation analysis

The Pearson Correlation coefficient is a term that refers to the strength of a relationship between two or more variables. 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 perfect 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. Correlation analysis is a measure of association that is based on numerical values of the two variables. It is preferred in this study to identify the relationship between variables whether the relationship is significant or not. In other words, it is done between the explanatory variables and profitability variables to explore whether there is a positive or negative relationship between these variables.

Table 16

Correlation analysis of variables associated with return on asset (ROA)

Regressor	ROA	CAR	NPL	LQR	CDR
ROA	1.000				
CAR	0.204	1.000			
NPL	-0.201	-0.320	1.000		
LQR	-0.300	-0.074	0.124	1.000	
CDR	-0.073	-0.110	0.122	0.553	1.000

The correlation coefficient of return on asset and capital adequacy ratio i.e. CAR is 0.204, which means there is a positive correlation between return on asset and capital adequacy ratio. This implies that as the capital adequacy ratio of the Nepalese commercial bank increase the return on assets increase. It is a positive relationship between the Capital adequacy ratios to Return on assets.

The correlation coefficient of return on asset and non-performing loan ratio i.e. NPL is -0.201, which means there is a negative correlation between return on asset and non-performing loan.

This implies that as the non-performing loan of the Nepalese commercial bank increases the return on assets decreases. It is a negative or inverse relationship between the Capital adequacy ratios to return on asset.

The correlation coefficient of return on asset and Credit to deposit ratio i.e. -0.073, means there is a negative correlation between return on asset and Credit to deposit ratio. It is a negative relationship between the credits to deposit ratio. This implies that as the Credit to deposit ratio of the Nepalese commercial bank increase the return on assets also decreases. It is a negative correlation relationship between the credits to deposit ratio to Return on assets.

The correlation coefficient of return on asset and liquidity ratio i.e. -0.300, means there is a negative correlation between return on asset and Credit to liquidity ratio. This implies that as the Liquidity ratio increases the Nepalese commercial bank then decreases the return on assets. So it is a negative correlation relationship between ROA and LQR.

Table 17

Correlation analysis of variables associated with return on equity (ROE)

Variable	ROE	CAR	NPL	LQR	CDR
ROE	1.000				
CAR	-0.196	1.000			
NPL	-0.129	-0.320	1.000		
LQR	-0.467	-0.074	0.124	1.000	
CDR	-0.125	-0.110	0.122	0.553	1.000

The correlation coefficient of return on equity and capital adequacy ratio i.e. CAR is -0.196, which means there is a negative correlation between return on equity and capital adequacy ratio. This implies that as the capital adequacy ratio of the Nepalese commercial bank increase the return on equity decrease. It is a negative or inverse relationship between the Capital adequacy ratio to Return on equity.

The correlation coefficient of return on equity and non-performing loan ratio i.e. NPL is -0.129, which means there is a negative correlation between return on equity and non-performing loan. This implies that as the non-performing loan of the Nepalese commercial bank increase the return on equity decrease. It is a negative or inverse relationship between the Capital adequacy ratios to return on equity.

The correlation coefficient of return on equity and Credit to deposit ratio i.e. -0.125, means there is a negative correlation between return on equity and Credit & deposit ratio. It is a negative relationship between the credits to deposit ratio. This implies that as the Credit to deposit ratio of the Nepalese commercial bank increase the return on equity also decreases. It is a negative relationship between ROE and CDR.

The correlation coefficient of return on equity and Liquidity ratio i.e. -0.467, means there is a negative correlation between return on equity and liquidity ratio. It is a negative relationship between liquidity ratios. This implies that as the liquidity ratio of the Nepalese commercial bank increase the return on equity also decreases. It is a negative relationship between ROE and LDR.

4.3 Regression analysis with dependent variable ROA

As stated in the research design and methodology section, the study used one model to estimate the qualitative effect of Capital Adequacy ratio (CAR), Nom-performing loan (NPL), Credit to deposit ratio (CDR), and Liquidity ratio (LQR) on the profitability of Nepalese commercial banks measured by ROA, ROE, and Average profitability ratio. In order to test the statistical significance and insignificance of the result, the multiple regression analysis with respect to the use of an econometric method has been carried out. It basically deals with regression results from various models to analyze the estimated relationship of different bank-specific performance indicators with the financial institution profitability of selected commercial banks during a period of the fiscal year 2011/12 to 2020/21. The two models of regression analysis fixed-effect model and the random effect model are the major concern of the study which is based on the result of the Hausman (1978) test. The below table shows the regression results of independent variables in CAR, NPL, CDR, and LQR with dependent variable ROA fixed and random effect model;

4.3.1 Regression of fixed effect model

The fixed effect model is one of the statistical models in which the values of independent variables are assumed to be constant and there change in independent variables only due to the change in the value of independent variables other things remain the same. The bellow table shows the regression results of independent variables i.e. CAR, NPL, CDR, and LQR with the dependent variable being ROA under the fixed-effect model.

Table 18

Regression analysis result on ROA using a fixed effect model

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CAR	-.012	.028	-0.42	.647	-.067	.043	
NPL	-.112	.048	-2.31	.023	-.208	-.016	**
LQR	-.006	.006	-0.93	.352	.017	.006	
CDR	.015	.01	1.46	.147	-.005	.035	
Constant	1.179	.762	1.55	.125	-.332	2.689	

Mean dependent var	1.537	SD dependent var	0.529
R-squared	0.472	Number of obs	120
F-test	2.017	Prob > F	0.021
Akaike crit. (AIC)	111.196	Bayesian crit. (BIC)	125.134

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

Table 18 describe the result of regression analysis of ROA with different independent variables defined for the study. The result of the regression coefficient of CAR is -0.012. This is a negative relationship between ROA and CAR and insignificant relationship between ROA and CAR. The result of the regression coefficient of NPL is -0.112.Which is a negative relationship between ROA and NPL and poorly significant relationship between NPL and ROA. The result of the regression coefficient of CDR is 0.015. It is a positive relationship between CDR and ROA and insignificant relationship between CDR and ROA. The result of the regression coefficient of LQR is -.006.Which is a negative relationship between LQR and ROA and insignificant relationship between LQR and ROA.

4.3.2 Regression of random effect model

The random effect model is one of the statistical models in which the effect that defines the systematic component shows different from random variation. In other words, this is the model which helps to provide a suitable result by null the correlation among the unobserved heterogeneity variables. The below table shows the regression result of independent variables i.e. CAR, NPL, LQR, and CDR with dependent variable ROA under using a random effect model.

Table 19

Regression analysis result on ROA using a random effect model

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CAR	-.014	.025	0.55	.583	-.035	.062	
NPL	-.103	.045	-2.31	.021	-.191	-.016	**
LQDT	-.011	.005	-2.09	.037	-.022	-.001	**
CDR	.016	.01	1.50	.134	-.005	.036	
Constant	1.228	.761	1.61	.107	-.264	2.719	

Mean dependent var	1.537	SD dependent var	0.529
Overall r-squared	0.426	Number of obs	120
Chi-square	10.249	Prob > chi2	0.036
R-squared within	0.061	R-squared between	0.206

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

Table 19 defined the result of regression analysis of ROA with different independent variables defined for the study. The result of the regression coefficient of CAR is -0.014. This is a negative relationship between ROA and CAR and insignificant relationship between ROA and CAR. The result of the regression coefficient of NPL is -0.103.Which is a negative relationship between ROA and NPL and significant relationship between NPL and ROA. The result of the regression coefficient of CDR is 0.016. It is a positive relationship between CDR and ROA and insignificant relationship between CDR and ROA. The result of the regression coefficient of LQR is -.011.Which is a negative relationship between LQR and ROA and significant relationship between LQR and ROA.

4.3.3 Model selection using the Hausman test

Hausman test was developed in 1978 in the test that helps to find the econometric model misspecification that exists among the variables between fixed and random effect models. So, this test helps to choose the appropriate econometric model for the regression analysis of the variables. Hausman test of the regression analysis of the fixed-effect model and random effect model of selected sample bank.

Table 20

Result of Hausman test

	Coef.
Chi-square test value	4.803
P-value	0.214

Here, the p-value from the Hausman Test P-value is 0.214, which is higher than 0.05 at significance at a 95% confidence level. It indicates that not rejected the null hypothesis and accepted the null hypothesis. Since the null hypothesis is accepted the random effect model is an appropriate model for panel data regression analysis or it is more relevant in describing the relationship among the given variables.

4.3.4 Analysis of panel Regression of random effect model with ROA

The regression of the independent variables with the dependent variable ROA is carried out to study the relationship among them using the balanced panel data of the sampled commercial banks. The test of significance along with the degree of influence on dependent variable ROA is shown below;

Table 21

Regression analysis result on ROA using a random effect model

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CAR	-.014	.025	0.55	.583	-.035	.062	
NPL	-.103	.045	-2.31	.021	-.191	-.016	**
LQDT	-.011	.005	-2.09	.037	-.022	-.001	**
CDR	.016	.01	1.50	.134	-.005	.036	
Constant	1.228	.761	1.61	.107	-.264	2.719	
Mean dependent var		1.537	SD dependent var		0.529		
Overall r-squared		0.426	Number of obs		120		
Chi-square		10.249	Prob > chi2		0.036		
R-squared within		0.061	R-squared between		0.206		

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

Based on the above results the following equation has been created are as below;

ROA = 1.228 – 0.014CAR – 0.103NPL + 0.016CDR – 0.011LQR + e

Table 21 analyze the result of regression analysis when ROA regressed on capital adequacy ratio, non-performing loan, credit to deposit ratio and liquidity ratio. The result shows that there statically negative insignificant relationship between capital adequacy ratio (CAR) and return on asset (ROA). Since the p- value is 0.583 higher than 0.05 or 95% confidence level. The regression coefficient of capital adequacy ratio is -0.014, which observe that increase the risk weighted assets ratio than decrease the return on assets. So, it is negative or inverse relationship between CAR and ROA.

The regression of coefficient credit to deposit ratio (CDR) is 0.016. There is positive correlation between CDR and ROA. There is statically insignificant relationship between credit to deposit ratio (CDR)) and return on assets (ROA). In above table the p- value is 0.134 respectively which is higher than 0.05 or 95% confidence level. Which indicates that increase/decrease a credit to deposit ratio than increase/decrease the return on assets, it is positive correlation between credit to deposit ratio (CDR) and return on assets (ROA).

The regression of coefficient NPL and LQR is -0.103 and -0.11 respectively. There is negative correlation between NPL, LQR and ROA. There is statically significant relationship between non-performing loan (NPL) and liquidity ratio (LQR) and return on assets (ROA). In above table the p- value is 0.021 and 0.037 respectively which is less than 0.05 or 95% confidence level. The regression of coefficient NPL and LQR is -0.103 and -0.11 respectively, which means if increase the NPL and LQR than decrease the return on assets (ROA). It is inverse or negative relationship between NPL, LQR and ROA.

4.4 Regression analysis with dependent variable ROE

The multiple regression analysis with respect to the econometric method has been carried out in order to test the tactical significance and insignificance of the results Alajmi et *al*. (2015).The model for the regression analysis of dependent and independent variables was to be based on the result of the Hausman test that has been explained below;

4.4.1 Regression of fixed effect model with ROE

The fixed effect model is one of the statistical models in which the values of independent variables are assumed to be constant and there change in independent variables only due to the change in the value of independent variables other things remain the same. The bellow table

shows the regression results of independent variables i.e. CAR, NPL, LQR, and CDR with the dependent variable being ROE under the fixed-effect model.

Table 22

Regression analysis results on ROE using fixed effect model

ROE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CAR	-1.085	.378	-2.87	.005	-1.835	-.334	***
NPL	-1.025	.662	-1.55	.124	-2.337	.287	
LQR	-.345	.081	-4.29	0	-.505	-.186	***
CDR	.295	.139	2.12	.037	.019	.571	**
Constant	39.973	10.398	3.84	0	19.354	60.592	***
Mean dependent var		18.637	SD dependent var		7.591		
R-squared		0.513	Number of obs		120		
F-test		11.868	Prob > F		0.000		
Akaike crit. (AIC)		738.493	Bayesian crit. (BIC)		752.430		

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

Table 22 shows the result of regression analysis of ROE with different independent variables and dependent variables defined for the study. The result of the regression coefficient of CAR is -1.085. It is a negative relationship between ROE and CAR but a significant relationship between ROE and CAR. The result of the regression coefficient of NPL is -1.025.Which is a negative relationship between CAR and ROE. The result of the regression coefficient of CDR is 0.295. It is a positive relationship between CDR and ROE. The regression coefficient of liquidity ratio (LQR) is -0.345. It is a negative relationship between ROE and LQR but it is a significant relationship between CAR and LQR.

4.4.2 Regression of random effect model with ROE

The random effect model is one of the statistical models in which the effect that defines the systematic component shows different from random variation. In other words, this is the model which helps to provide a suitable result by null the correlation among the unobserved heterogeneity variables. The below table shows the regression result of independent variables i.e. CAR, NPL, LQR, and CDR with dependent variable ROA under using random effect model.

Table 23

Regression analysis results on ROE using random effect model

ROE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CAR	-1.011	.331	-3.05	.002	-1.66	-.362	***
NPL	-1.107	.598	-1.85	.064	-2.279	.065	*
LQR	-.374	.071	-5.25	0.00	-.514	-.234	***
CDR	.292	.137	2.12	.034	.023	.561	**
Constant	41.595	10.092	4.12	0.00	21.816	61.374	***

Mean dependent var	18.637	SD dependent var	7.591
Overall r-squared	0.515	Number of obs	120
Chi-square	52.201	Prob > chi2	0.000
R-squared within	0.313	R-squared between	0.389

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

Table 23 defined the result of regression analysis of ROE with different independent variables and dependent variables defined for the study. The regression coefficient of CAR is -1.011.Which is a negative relationship between ROE and CAR. It is a negative relationship between ROE and CAR but a significant relationship between ROE and CAR. The result of the regression coefficient of NPL is -1.107. It is a negative relationship between CAR and ROE. The result of the regression coefficient of CDR is 0.292.Which is a positive relationship between CDR and ROE. The result of the regression coefficient of LQR is -0.374. It is a negative relationship between ROE and LQR but it is a significant relationship between CAR and LQR.

4.4.3 Selection on Hausman test

Hausman test was developed in 1978 in the test that helps to find the econometric model misspecification that exists among the variables between fixed and random effect models. So, this test helps in choosing the appropriate econometric model for the regression analysis of the variables. Hausman test of the regression analysis of the fixed-effect model and random effect model of selected sample bank.

Table 24

Result of Hauseman test

	Coef.
Chi-square test value	2.704
P-value	0.609

Here, the p-value from the Hausman Test P-value is 0.609, which is higher than 0.05 at significance at a 95% confidence level. It indicates that not rejected the null hypothesis and accepted the null hypothesis. Since the null hypothesis is accepted the random effect model is an appropriate model for panel data regression analysis or it is more relevant in describing the relationship among the given variables.

4.4.4 Analysis of panel Regression of random effect model with ROE

The regression of the independent variables with the dependent variable ROE is carried out to study the relationship among them using the balanced panel data of the sampled commercial banks. The test of significance along with the degree of influence on dependent variable ROE is shown below;

Table 25

Regression analysis results on ROE using random effect model

ROE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CAR	-1.011	.331	-3.05	.002	-1.66	-.362	***
NPL	-1.107	.598	-1.85	.064	-2.279	.065	*
LQR	-.374	.071	-5.25	0.00	-.514	-.234	***
CDR	.292	.137	2.12	.034	.023	.561	**
Constant	41.595	10.092	4.12	0.00	21.816	61.374	***

Mean dependent var	18.637	SD dependent var	7.591
Overall r-squared	0.315	Number of obs	120
Chi-square	51.201	Prob > chi2	0.000
R-squared within	0.313	R-squared between	0.389

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

Based on the above results the following equation has been created are as below;

ROE = 41.595 – 1.011CAR -1.107NPL + 0.292CDR – 0.374LQR + e

Table no 25 analyze the result of regression analysis of ROE with different independent variables and dependent variables defined for the study. The coefficient regression analysis of capital adequacy ratio (CAR) value is -1.011, it observe that increase the risk-weighted assets ratio than decrease the return on equity. So, it is negative or inverse relationship between CAR and ROE, but there is statically significant relationship between capital adequacy ratio (CAR) and return on equity (ROE). Since the p- value 0.002 is lower than 0.05 or 95% confidence level. So, it is negative or inverse relationship between CAR and ROE but statically significant relationship between capital adequacy ratio (CAR) and return on equity (ROE).

The regression of coefficient credit to deposit ratio (CDR) is 0.292. There is positive correlation between CDR and ROE. There is statically significant relationship between credit to deposit ratio (CDR)) and return on equity (ROE). In above table the p- value is 0.034, which is lower than 0.05 or 95% confidence level. Which indicates that increase/decrease a credit to deposit ratio than increase/decrease the return on equity, it is positive correlation between credit to deposit ratio (CDR) and return on equity (ROE).

The regression of coefficient liquidity ratio (LQR) is -0.374. There is negative correlation between LQR and ROE. There is statically significant relationship between liquidity ratio (LQR) and return on equity (ROE). In above table the p- value is 0.0, which is lower than 0.05 or 95% confidence level. Which indicates that increase the liquidity ratio than decrease a return on equity, it is negative correlation between liquidity ratio (LQR) and return on equity (ROE) but statically significant relationship between LQR and ROE.

The regression of coefficient non-performing loan (NPL) is -1.107. There is negative correlation between NPL and ROE. There is statically poor significant relationship between non-performing loan (NPL) and return on equity (ROE). In above table the p- value is 0.064, which is higher than 0.05 or 95% confidence level. Which indicates that increase the non-performing loan than decrease a return on equity, it is negative correlation between credit to deposit ratio (LQR) and return on equity (ROE) but statically poor significant relationship between NPL and ROE.

4.5 Result of hypothesis

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

The Table 26 shows the summary result of hypothesis testing;

Table 26

Summary of results on hypothesis testing

Null hypothesis	P-value	Result
Ho1: There is no significant relationship between capital adequacy ratio and return on assets.	0.583	Accepted
Ho2: There is no significant relationship between capital adequacy ratio and return on equity.	0.002	Rejected
Ho3: There is no significant relationship between non-performing loan and return on assets.	0.021	Rejected
Ho4: There is no significant relationship between non-performing loan and return on equity.	0.064	Accepted
Ho5: There is no significant relationship between credit to deposit ratio and return on assets.	0.134	Accepted
Ho6: There is no significant relationship between credit to deposit ratio and return on equity.	0.034	Rejected
Ho7: There is no significant relationship between liquidity ratio and return on assets.	0.037	Rejected
Ho8: There is no significant relationship between liquidity ratio and return on equity.	0.00	Rejected

The Table 26 shows the result of hypothesis testing with respect to the P-value calculated through the regression analysis using econometric model. The null hypothesis 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 Ho1, Ho4 and Ho5 is accepted which is the P-value is greater than 5% and implies that there exist insignificant relationships between the different dependent variables.

4.5 Discussion

The analysis of the capital adequacy ratio and profitability of Nepalese commercial banks along with other independent variables such as capital adequacy ratio (CAR) with controlling variables such as non-performing loan, credit to deposit ratio and liquidity ratio and dependent variables such as ROA and ROE were carried out in this study. Using the econometric method of regression analysis and using a Hausman test, to find out the best alternative method between the fixed-effect model or random effect model were selected and certain conclusions were to be written. Referring to the different reviews of articles, journals, and scholarly frameworks regarding the relationship between independent and dependent variables has been developed. For the analysis of all the random selection, all commercial bank data used the econometric method has been used. Which Hausman test was conducted to select the best model from the fixed effect model or random effect model. While carrying out the Hausman test null hypothesis is accepted hence random effect model became suitable for the analysis of data as per the random effect model and fixed model. The studies of Datta and Mahmud (2018),Mekonnen (2015) found positive relationship between CAR and ROA. Similarly Shingjergji and Hyseni (2015), Noman et al. (2015) found negative relationship between CAR and ROE.

Mainly the data are analyzed on the basis of the result from descriptive statistics, correlation, and regression analysis. From the findings of descriptive statistics, the average ROA and ROE value is 1.54% & 18.64% with a standard deviation of 0.16% & 2.49% respectively. It shows that there is a satisfactory impact on profitability with average variation in return and risk. The average capital adequacy ratio is 13.24% with a standard deviation of 0.71% respectively. It shows the inverse impact on risk and return. The average non-performing loan is 1.02% with a standard deviation is 0.34%, the average value of CDR is 89.27% with a standard deviation is 0.49% and the average value of liquidity ratio is 79.44% with a standard deviation value is 1.57% respectively. The findings are shown on the ROA and ROE. Rivard and Thomas (1997) suggest that bank profitability is best measured by ROA in that ROA is not distorted by high equity multipliers and ROA represents a better measure of the ability of the firm to generate returns on

its portfolio of assets. ROA gives an idea of how efficient management is at using its assets to generate earnings.

The major findings from this analysis are presented below:

- The Capital Adequacy indicator in this study such as capital adequacy ratio, non-performing loan, credit to deposit ratio, and liquidity ratio shows a significant/ insignificant relationship with the profitability. It is supported by Alkadmani (2015) who finds that a bank's profitability is negatively related to CAR. Mekonnen (2015) investigated the relationship between bank capital and profitability. It showed no significant relationship between capital adequacy ratio and profitability.
- The average capital adequacy position of the BOKL is 13.36%. Similarly the average capital adequacy ratio of EBL, HBL, KBL, LBL, MBL, NABIL, NCCB, NIBL, NSBI, SBL and SCB is 12.82%, 12.36%, 12.95%, 12.04%, 13.37%, 12.68%, 12.35%, 13.50%, 13.77%, 12.30% and 17.41% respectively. The SCB has 17.41% i.e. highest capital adequacy ratio and the LBL bank has the lowest capital adequacy ratio i.e. 12.04%. So, all selected commercial banks are maintained a minimum capital adequacy ratio of 10% norms followed by Nepal rastrya bank (NRB) norms and capital adequacy guideline rules.
- Based on the finding from regression analysis, CAR indicates that there is a negative and statistically insignificant relationship between the Capital Adequacy ratio and profitability ratio of the selected Nepalese commercial bank over the ten-year period. It means when the capital adequacy ratio increases the profitability of Nepalese commercial banks decreases.
- It indicates that there is a negative but statistically significant relationship between non-performing loans (NPL) with ROA and ROE. It means when the non-performing loan increases, the ROA and ROE decrease, and vice versa. It indicates there is a negative but statistically significant relationship between ROA and ROE. The non-performing loan indicates the negative and statistically significant relationship between NPL and Profitability ratio.
- It indicates that there is a negative but statistically significant relationship between liquidity ratio and ROA and ROE. It means LQR increases the ROA & ROE decreases respectively. It indicates that there is a negative and statistically significant relationship between LQR and Profitability indicator ROA and ROE respectively

- It indicates that there is a positive but statistically significant relationship between the credit to deposit ratio and ROA and ROE. It indicates that there is a positive but statistically significant relationship between the credit to deposit ratio (CDR) and Profitability ratio
- It is observed that the bank has been complying with the requirements of the Capital Adequacy norms of NRB. The bank has been increasing its capital fund to meet the cost of its capital adequacy requirement. The capital adequacy norms are required to safeguard the interest of depositors.
- It is observed that the average non-performing loan (NPL) of the sample selected commercial banks is 1.02% with a 0.34% of standard deviation. It means that there is an adequate capital fund for the sample commercial banks to safeguard the money of depositors.
- It is observed that the average credit to deposit ratio (CDR) of the sample selected commercial banks is 89.27% with a 0.49% of standard deviation. It means that there is an adequate capital fund for the sample commercial banks to safeguard the money of depositors.

CHAPTER V
SUMMARY AND CONCLUSION

This chapter includes a summary and conclusion for our research study and provides a recommendation. This begins with the summary of this research and, and then presents the quality assessment of the study with the conclusion of the research. Further research recommendations will be provided at the end of this chapter.

5.1 Summary

Financial institutions like banks are the replica of the modernization of society and play a vital role in the development of the economic growth of the country. Commercial banks furnish the necessary capital needed for trade and commerce for mobilizing the dispersed saving of the individuals and institutions. The primary functions of commercial banks are raising and utilization of funds. Commercial banks collect a large number of deposits from general public capital is one of the most important components of an organization. Actually, no organization can exist without capital (Ogboi, 2013). Although the banks are the major source of capital, they also have to raise capital to run a business. Especially, the bank capital has a significant role to play as the banks have obligations to mass people, its depositors. Thus, the bank should hold adequate capital to secure the interest of depositors Fiordelisi et *al.* (2010).

The main objectives of this were to identify the capital adequacy and its impact on the profitability of Nepalese commercial banks. This study had five research questions and specific objectives of establishing how these capital adequacy factors affect the profitability of commercial banks in Nepal. The first objective of this research study is to access the capital adequacy ratio position of the selected commercial banks. The second is to investigate the impact of capital adequacy indicators on return on assets (Capital Adequacy Ratio on the profitability of commercial banks in Nepal. The third is to analyze the CAR Maintained by a commercial bank as per directives of NRB and maintained a return on equity. The fourth is to find out the impact of the capital adequacy ratio on Earning per share. Lastly, the assess impact of the CAR on dividend per share to evaluate the risk-taking efficiency of the sample commercial banks on the basis ratio.

To achieve the objectives of the research, the research was conducted by collecting data from the twelve commercial bank annual reports from 2011/12 to 2020/21. In order to test the relationship between dependent and independent variables, correlation and regression analyses are done. The study is based on an analysis of both primary and secondary data of twelve 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 rastrya bank, and financial statistics and quarterly reports of respective banks. This study hypothesizes that there is no significant relationship between variables such as capital adequacy ratio, liquidity ratio, and credit to deposit ratio 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 favored over the fixed effect model using the Hausman test since the unobserved heterogeneity exists among the variables. Descriptive statistics, correlation analysis, and regression analysis is made to analyze the data collected from the sample bank's annual report and other sources to fulfill the objectives.

The descriptive statistics show that Nepalese commercial banks are earning satisfactory profits with an average variation of return. The average CAR is 13.24% of the twelve commercial banks over ten year period, which is higher than the regulatory requirement of 10%. It is evidence of compliance with NRB directives and Basel III requirements. The risk associated with this return on assets ratio is 1.54%, which shows that Nepalese banks are investing in safe securities. The return on equity ratio is 18.64%, which shows that the commercial banks are investing in risk-free assets, they are risk averters.

The correlation coefficient of dependent variable return on asset (ROA) and independent variable capital adequacy ratio(CAR) i.e. CAR is 0.204, which means there is a positive correlation between ROA and CAR. The correlation coefficient of return on assets (ROA) and non-performing loan ratio (NPL) i.e. NPL is -0.201, which means there is a negative correlation between ROA and NPL. The correlation coefficient of return on asset (ROA) and Credit to deposit ratio (CDR) i.e. -0.073, means there is a negative correlation between ROA and CDR.

The correlation coefficient of return on asset (ROA) and liquidity ratio (LQR) i.e. -0.300, means there is a negative correlation between ROA and LQR. The correlation coefficient of return on equity (ROE) and capital adequacy ratio (CAR) is -0.196, which means there is a negative correlation between ROE and CAR. The correlation coefficient of return on equity (ROE) and non-performing loan ratio (NPL) is -0.129, which means there is a negative correlation between ROE and NPL. The correlation coefficient of return on equity (ROE) and Credit to deposit ratio (CDR) is -0.125, which means there is a negative correlation between ROE and CDR. The correlation coefficient of return on equity (ROE) and liquidity ratio (LQR) is -0.467, which means there is a negative correlation between ROE and LQR.

The regression analysis shows a relationship with independent variables like capital adequacy ratio, non-performing loan, credit to deposit ratio, and liquidity ratio and dependent variables both. Under this study, two dependent variables are used for profitability indicators like ROA and ROE. The ROA is considered a strong indicator of profitability. It indicates that there is a negative with CAR but the statistically significant relationship of CAR with ROA with a significant level of 0.005. It indicates the negative relationship between CAR and ROE. There is a significantly negative relationship between capital adequacy ratio and Return on equity. The independent variable of the non-performing loan with a dependent variable like ROA and ROE regression analysis results are both negative but significant levels at 0.005. There is a negative but statically significant at 0.005. The result of regression analysis of independent variable credit to deposit ratio and dependent variable like ROA and ROE both are negative but statically significant level at 0.005. The regression analysis of independent variable credit to deposit ratio and dependent variable ROA and ROE both results carried out the positive but statically credit to deposit ratio and ROA is insignificant than also credit to deposit ratio and ROE is insignificant level at 0.005.

Thus as per the objectives of a research study, the findings are sufficient to meet the objectives. The average capital adequacy ratio of the selected commercial bank is 13.24% with a standard deviation and coefficient of correlation of 0.71% & 0.0.44% respectively. As per the Capital Adequacy framework 2015, all commercial banks shall maintain a 10% of minimum capital Adequacy ratio. The sample commercial banks are able to meet the directives of NRB. The average CAR of the ten commercial banks is slightly higher than the set criteria, which means

over capitalization also leads to low profitability and low goodwill. Adequate capital is the correct capital. The capital adequacy ratio is a major financial policy indicator of the organization in the financial institution. Financial institutions have maintained a directive of the NRB guideline.

The study is based on an analysis of both primary and secondary data of twelve 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 rastrya bank, and financial statistics and quarterly reports of respective banks. This study hypothesizes that there is no significant relationship between variables such as capital adequacy ratio, liquidity ratio, and credit to deposit ratio 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 favored over the fixed effect model using the Hausman test since the unobserved heterogeneity exists among the variables.

5.2 Conclusion

This paper examines the valuation of the capital adequacy framework for randomly selected Nepalese commercial banks. It attempts to determine the relative importance of the capital adequacy framework and dependent and independent variable's impact on the capital adequacy ratio. After summarizing the objective of the study, it is the section where the conclusion is drawn. With some twenty-seven commercial banks operating in Nepal, the market seems over-crowded and the banks are now finding tough competition among themselves. Since the entry barriers are not so high due to the government's liberal policy, this competition is expected to be more intense soon, as there is always the possibility of a new player entering this financial banking sector. The commercial banks in Nepal are doing well but they are not giving satisfactory results due to some internal and external factors. Commercial banks of Nepal are bound by the directives of Nepal rastra bank. Directives No. 1 has set norms on capital adequacy for commercial banks. Every commercial bank has to meet the requirement of capital adequacy as stated by the directives issued by NRB rules and regulations. Capital adequacy is the portion of the capital fund regarding risk-weighted assets that commercial banks hold. Capital adequacy

is required for the money of the depositors as the banks are playing with the money they collected from the depositors (NRB 2017). Based on the findings, it can be concluded that the Capital Adequacy ratio, has an insignificant impact on ROA at a 0.05 level with a positive relationship; which means any increase/decrease in the value of these variables leads to an increase/decrease in profitability performance of Commercial banks on return on assets (ROA).

NRB (2019) analyze that investing safely and taking a medium risk. Nepalese commercial banks are risk averters. The study shows that profitability is negatively related to CAR. The most significant finding in this study which other similar studies have not pointed out is the fact that there are differential effects of the various measures of capital adequacy on the profitability of the banks. These findings are significant in the sense that the risk adjustment helps to account for the uncertainty associated with the bank's capital levels. Thus it can be concluded the relationship of independent variables shows a very low impact on the profitability of commercial banks of Nepal. The study shows that the profitability of commercial banks in terms of ROA and ROE are major dependent variables with capital adequacy ratio. So they are investing safely and taking a medium risk. Nepalese commercial banks are risk averters. The study shows that profitability indicator is negatively related to CAR. The most significant finding in this study which other similar studies have not pointed out is the fact that there are differential effects of the various measures of capital adequacy on the profitability of the banks.

The summary and conclusion of this study are as bellows:

- This study focused on capital adequacy as the main independent variable and non-performing loan, credit to deposit ratio, and liquidity ratios are control independent variables and ROA and ROE as the dependent variables for evaluating banks' profitability. But the same study could be developed by including more independent and other dependent variables in the regression model and increasing the sample size.
- This study can be replicated in other industries to know what the capital adequacy indicators that affect profitability are. Thus the study can be done in other sectors of the other categories of the financial institution, economy such as the manufacturing sector to determine the firm-specific factors that influence their profitability performance.

5.3 Implications

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

- This study focused on capital adequacy as the main independent variable and ROE and ROE as the dependent variables for evaluating banks' profitability. But the same study could be developed by including more independent and other dependent variables in the regression model and increasing the sample size.
- The current study fully employed secondary data obtained from financial reports of banks or through Nepal rastra bank or SSpro.com which can have potential bias. Thus, future research is recommended to substantial and/or triangulate secondary by primary data.
- This study can be replicated in other industries to know what the capital adequacy indicators that affect profitability are. Thus this study can be done in other sectors of the other categories of the financial institution, economy such as the manufacturing sector to determine the firm-specific factors that influence their profitability performance.
- The study also suggests that another study can be done in the banking industry by covering a longer period to establish trends, bank growth rate, bank size, and dividend capacity of the bank to determine what factors may influence the bank profitability performance.
- Limited statistical tools and techniques were used to analyze the data analysis and to test the result; therefore other various statistical tools could be used to get a more actual result.
- To reduce the level of NPL 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.
- This research could be used by the creditors and depositors, to investigate the situation of the commercial banks, bank size, and the number of branches in Nepal and for taking the best alternative solution for the banking sector and try to solve the problem.

- This study can be replicated in other industries to know what the capital adequacy indicators that affect profitability are. Thus this study can be done in other sectors of the economy such as the banking and financial sector to determine the firm-specific factors that influence their profitability performance.
- The study also suggests that another study can be done in the banking industry by covering a longer period to establish trends, bank size, and no branches to determine what factors may influence the bank's profitability performance.
- The study observed a negative relationship between capital adequacy ratio and return on assets, return on equity, earnings per share, and dividend per share, the Nepalese commercial banks should minimize the capital adequacy ratio.

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Appendix

Appendix 1: Capital adequacy ratio of sampled banks

Year	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
BOKL	11.07	12.58	11.57	13	13.67	13.97	15.07	14.58	14.09	14.02
EBL	11.02	11.6	11.15	13.33	12.67	14.69	14.2	13.75	13.23	12.51
HBL	11.02	12.15	11.58	11.45	10.91	12.23	13.03	12.73	14.67	13.85
KBL	11.94	12.23	11.92	11.12	12.02	16.15	13.93	12.07	14.42	13.71
LBL	11.68	12.27	12.12	10.95	11.15	14.02	12.54	11.33	12.46	11.85
MBL	15.04	12.66	10.38	12.47	12.23	17.48	15.6	12.88	13	12
NABIL	11.01	13.29	13.23	11.91	12.65	13.34	13.18	12.71	12.81	12.69
NCCB	11.77	11.95	11.58	11.43	11.8	12.3	11.38	14.04	13.4	13.8
NIBL	11.82	12.99	12.71	11.99	16.19	14.47	13.34	13.65	13.23	14.64
NSBI	11.43	12.86	12.2	13.47	13.33	15.76	15.26	14.01	15.44	13.93
SBL	11.54	12.3	12.27	11.19	11.12	13.21	12.43	12.56	12.97	13.45
SCB	14.37	14.48	14.3	13.86	15.82	22.04	23.68	19.9	18.54	17.17

Appendix 2: Non- performing loan ratio of sample bank

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
BOKL	2.3	1.5	1.06	3.47	2.51	1.29	3.04	1.54	2.28	1.04
EBL	0.84	0.62	0.97	0.66	0.38	0.25	0.2	0.16	0.22	0.12
HBL	2.09	2.89	1.96	3.22	1.23	0.85	1.4	1.12	1.01	0.48
KBL	2.21	2.89	4.03	2.49	1.15	1.86	1.05	1.01	1.39	0.96
LBL	0.62	1.51	1.15	1.3	0.8	0.93	1.29	1.11	1.04	0.75
MBL	2.84	2.84	1.78	0.64	0.55	0.38	0.44	0.37	0.52	0.62
NABIL	1.77	2.26	2.13	2.25	1.14	0.8	0.55	0.74	0.98	0.84
NCCB	3.82	2.73	2.8	2.75	1.93	7.49	3.87	2.78	2.86	1.76
NIBL	3.32	1.91	1.77	1.25	0.68	0.83	1.36	2.78	2.91	2.46
NSBI	0.54	0.37	0.26	0.19	0.14	0.1	0.2	0.2	0.23	0.23
SBL	1.52	2.39	2.75	1.8	1.47	1.3	1.09	0.75	1.38	1
SCB	0.78	0.77	0.48	0.34	0.32	0.19	0.18	0.15	0.44	0.96

Appendix 3: Credit to deposit ratio of the sample bank

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
BOKL	77.3	83.21	84.61	84.61	78.76	75.34	76.3	75.8	70.79	77.78
EBL	73.22	71.84	75.06	66.63	73.52	82.32	75.98	75.07	68.57	72.5
HBL	75.36	72.41	70.87	73.51	77.27	79.07	77.02	75.59	66.85	76.77
KBL	76.27	75.19	77.37	74.66	74.31	78	76.54	78.32	75.85	81.01
LBL	72.32	72.92	72.05	75.06	76.21	71.76	77.07	77.13	71.77	79.66
MBL	74.62	72.37	73.29	72.51	76.26	76.58	76.13	76.98	73.81	80.12
NABIL	77.91	74.42	77.51	65.12	73.84	75.62	74.68	72.9	68.08	79.22
NCCB	78.25	68.62	74.1	74.21	74.52	71.48	76.76	73.84	74.88	78.14
NIBL	75.3	73.6	76.94	72.76	75.74	77.63	75.01	71.97	72.93	75.12
NSBI	49.62	75.18	65.47	79.11	76.57	75	74.38	74.38	63.2	74.86
SBL	79.42	76.53	73.34	76.71	77.55	76.71	74.23	76.85	72.85	77.42
SCB	65.38	67.8	70.74	62.34	70.34	72.34	71.68	73.13	66.43	75.83

Appendix 4: Liquidity ratio (LQR) of the sample bank

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
BOKL	72.28	78.72	79.07	80.61	86.43	84.83	90.48	91.17	87.98	95.2
EBL	72.74	76.24	72.21	66.05	73.43	82.2	81.75	85.89	82.02	83.87
HBL	71.82	74.71	68.65	72.26	76.58	81.18	87	87.51	81.84	88.94
KBL	81	79.32	82.66	80.86	79.26	86.79	90.08	90.27	94.59	93.27
LBL	69.41	73.74	71.49	73.55	80.66	85.4	91.48	89.36	89.61	92.93
MBL	74.37	79.72	78.69	76.39	83.73	86.74	88.81	86.92	88.56	86.53
NABIL	77.66	74.71	74.06	64.27	70.34	76.89	82.56	80.6	79.27	89.99
NCCB	78.06	73.53	80.18	79.77	81.64	81.6	85.06	87.95	88.51	91.16
NIBL	74.57	75.88	71.91	73.96	79.85	83.15	86.69	86.69	86.03	96.21
NSBI	49.5	49.47	64.34	76.83	71.98	76.08	89.61	90.78	85.42	95.63
SBL	77.31	81.32	77.87	81.32	85.84	86.38	84.65	88.59	87.36	89.46
SCB	51.09	58.6	56.84	48.85	56.88	62.2	69.28	72.77	58.04	75.62

Appendix 5: Return on assets (ROA) of the sample bank

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
BOKL	2.04	1.84	1.29	0.76	0.91	1.49	2.69	1.85	1.33	1.13
EBL	1.93	2.21	2.17	1.56	1.5	1.69	1.2	1.71	1.27	0.86
HBL	1.88	1.62	1.46	1.32	1.88	2	2.06	2.09	1.61	1.66
KBL	0.97	0.96	0.95	0.88	1.65	1.02	1.35	1.29	0.8	1.01
LBL	1.32	1.42	1.26	0.81	1.16	1.18	1.14	1.49	1.17	1.02
MBL	0.04	0.5	1.08	1.21	1.42	1.73	1.32	1.51	0.97	1
NABIL	2.41	2.85	2.56	1.75	2.21	2.35	2.42	2.2	1.5	1.55
NCCB	0.99	1.4	1.37	1.25	1.89	0.76	1.94	1.67	1.14	0.92
NIBL	1.89	2.55	2.1	1.77	1.85	2.01	1.96	1.68	1.15	1.45
NSBI	0.8	1.17	1.47	1.75	1.63	1.49	1.78	1.89	1.12	0.67
SBL	0.98	1.37	1.79	1.38	1.54	1.25	0.94	1.5	1.16	1.17
SCB	2.73	2.59	2.51	1.97	1.9	1.76	2.5	2.58	1.67	1.2

Appendix 6: Return on Equity (ROE) of the sample bank

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
BOKL	25.01	22.86	15.7	10.05	10.64	16.69	24.07	16.06	11.79	10.38
EBL	35.03	35.31	32.16	28.67	25.06	23.16	14.76	20.87	15.51	9.7
HBL	26.34	22.12	20.81	18.56	27.84	22.99	21.11	21.51	17.78	17.54
KBL	11.76	12.27	12.09	11.89	22.27	8.8	12.94	12.84	7.18	12.37
LBL	16.9	19.26	17.34	10.78	13.55	9.99	10.07	14.25	11.9	10.08
MBL	0.41	5.97	16.57	19.16	19.49	16.39	13.31	17.84	12.11	14.43
NABIL	37.68	40.85	35.84	28.64	32.48	23.8	29.15	22.89	13.82	13.52
NCCB	11.31	19.29	16.27	15.32	23.77	8.92	23.6	13.89	9.39	9.58
NIBL	25.54	32.91	27.45	24.73	16.7	18.21	19.16	15.32	10.39	12.76
NSBI	16.69	24.3	24.23	23.18	23.25	17.08	17.34	19.46	11.55	6.66
SBL	15.31	22.5	31.11	24.62	24.51	14	10.78	18.07	15.07	16.27
SCB	31.9	29.41	29.95	25.69	21.1	12.91	17.92	19.54	15.12	9.45