

**IMPACT OF MARKET INTEREST RATE FLUCTUATIONS ON THE
PROFITABILITY OF NEPALESE COMMERCIAL BANKS**

A Dissertation Submitted to Office of the Dean, Faculty of Management in Partial
Fulfillment of the Requirements for the Master's Degree

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The assistance and cooperation that I have received during this research work has been acknowledged. In addition, I declare that all information sources and literature used are cited in the reference section of the dissertation.

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List of Contents

Certificate of Authorship	ii
Report of Research Committee	iii
Approval Sheet.....	iv
Recommendation	v
Acknowledgements.....	vi
List of Contents.....	vii
List of Tables	ix
List of figures.....	x
List of Abbreviations	xi
Abstract.....	xii
CHAPTER I- INTRODUCTION	1
1.1. Background of the study	1
1.1.1. Brief introduction of sample Commercial Banks	4
1.2. Statement of the problem	5
1.3. Objectives of the study.....	8
1.4. Research Hypothesis	8
1.5. Rationale of the study.....	9
1.6. Limitations of the study.....	10
1.7. Organization of the study	10
CHAPTER II- LITERATURE REVIEW	11
2.1. Conceptual review:.....	11
2.2. Review of previous studies:	13
a) Review of major literatures	13
b) Review of major Nepalese studies	22
2.3. Research Framework and definition of variables.....	26
2.3.1. Research Framework	26
2.3.2. Definition of Variables	27
2.4. Research Gap.....	30
CHAPTER III- RESEARCH METHODOLOGY	31

3.1. Research Design.....	31
3.2. Population, sample and sampling design	32
3.2.1. Description of the sample	32
3.3. Nature and sources of data and instrument of data collection.....	33
3.3.1. Nature and sources of data collection.....	33
3.3.2. Model Specification.....	34
3.3.3. Instrument of data collection	35
3.4. Methods of analysis.....	36
CHAPTER IV- RESULTS AND DISCUSSION	37
4.1. Presentation of results	37
4.2. Analysis of secondary data.....	37
4.2.1. Structure and pattern of bank profitability of Nepalese Commercial Banks....	37
4.2.2. Structure and Pattern of market interest rates and control variables	44
4.2.3. Test of Normality.....	56
4.2.4. Descriptive analysis	57
4.2.5. Correlation analysis	58
4.2.6. Regression Analysis	62
4.2.7. Discussion.....	66
CHAPTER V- SUMMARY AND CONCLUSIONS.....	69
5.1. Summary of findings.....	69
5.3. Conclusion.....	71
5.3. Implications.....	72
REFERENCES	74
APPENDIX.....	78

List of Tables

Table 3.1. Number of commercial banks selected for the study.....	33
Table 4.1. Structure and pattern of ROA of Nepalese Commercial Banks.....	38
Table 4.2. Structure and pattern of ROE of Nepalese Commercial Banks.....	40
Table 4.3. Structure and pattern of NIM of Nepalese Commercial Banks.....	41
Table 4.4. Structure and pattern of Loan Rate of Nepalese Commercial Banks.....	44
Table 4.5. Structure and pattern of Deposit Rate of Nepalese Commercial Banks.....	46
Table 4.6. Structure and pattern of Treasury Bill and Reverse Repo of Nepalese Commercial Banks.....	48
Table 4.7. Structure and pattern of Capital Adequacy of Nepalese Commercial Banks...	50
Table 4.8. Structure and pattern of Liquidity of Nepalese Commercial Banks.....	52
Table 4.9. Structure and pattern of Non-Performing Loan of Nepalese Commercial Banks.....	54
Table 4.10. Normality test for dependent and independent variables.....	56
Table 4.11. Descriptive statistics of dependent and independent variables.....	57
Table 4.12. Correlation matrix for ROA and independent variables.....	59
Table 4.13. Correlation matrix for ROE and independent variables.....	60
Table 4.14. Correlation matrix for NIM and independent variables.....	61
Table 4.15. Regression of market interest rates on Return on Assets.....	62
Table 4.16. Regression of market interest rates on Return on Equity.....	64
Table 4.17. Regression of market interest rates on Net Interest Margin.....	65

List of figures

Figure 2.1. Schematic Diagram of Factors influencing profitability.....	26
Figure 4.1. Trend of average ROA of Nepalese Commercial Banks.....	39
Figure 4.2. Trend of average ROE of Nepalese Commercial Banks.....	41
Figure 4.3. Trend of average NIM of Nepalese Commercial Banks.....	43
Figure 4.4. Trend of average LR of Nepalese Commercial Banks.....	45
Figure 4.5. Trend of average DR of Nepalese Commercial Banks.....	47
Figure 4.6. Trend of TBR of Nepalese Commercial Banks.....	48
Figure 4.7. Trend of RRP of Nepalese Commercial Banks.....	49
Figure 4.8. Trend of CA of Nepalese Commercial Banks.....	51
Figure 4.9. Trend of LQ of Nepalese Commercial Banks.....	53
Figure 4.10. Trend of NPL of Nepalese Commercial Banks.....	55

List of Abbreviations

CA	:	Capital Adequacy
COVID 19	:	Corona Virus Disease 2019
DR	:	Deposit Rate
FY	:	Fiscal Year
GDP	:	Gross Domestic Product
LQ	:	Liquidity
LR	:	Loan Rate
NBA	:	Nepal Bankers Association
NII	:	Net Interest Income
NIM	:	Net Interest Margin
NPL	:	Non-Performing Loan
NRB	:	Nepal Rastra Bank
RRP	:	Reverse Repo Rate
ROA	:	Return on Asset
ROE	:	Return on Equity
SD	:	Standard Deviation
SPSS	:	Statistical Package for the Social Science
TBR	:	Treasury Bill Rate

Abstract

Interest rate risk is a major issue of concern for financial institutions. If not failure, it can cause harm to a financial institution, by interacting with other risks. For instance, as interest rate rises, credit risk increases (as consumers are likely to default), which can lead to liquidity risk (as banks mostly depend on loan repayment for managing liquidity), which as a result can lead to solvency risk, ultimately affecting the profitability and capital positions of financial institutions. Banks play a vital role in the allocation of resources. Banks are such institutions which collect the deposits from the surplus unit and provide the deposits to the deficit units in the society. Banks collect the capital from one group of depositors and disburse it to those who seek the capital. The strength of economy of any country basically hinges on the strength and efficiency of financial system, which, in turn, depends upon a sound and solvent banking system. Considering the market interest rates scenario around the world and the research gaps in Nepalese context, this study is mainly focused on examining the relationship between market interest rates along with control variables and profitability of Nepalese commercial banks. Data are collected through secondary sources of data collection. The quantitative sample of this study includes data from 3 commercial banks out of 27 for the five years period from 2015/16-2019/20. Market Interest Rate is a major factor for determining the profitability of banks. Some studies have shown a positive relationship and other studies have shown negative or no relationship between Market Interest Rates and profitability. The study found that deposit rate has a significant impact on return on assets. Also, loan rate has a significant impact on return on equity. The study analyzed that loan rate and deposit rate have a significant impact on net interest margin. Likewise, Non-Performing Loan has a significant impact on banks' profitability.

CHAPTER I- INTRODUCTION

1.1. Background of the study

Financial system comprises of various functions. One of the major functions of any financial system involves the transfer of funds from lenders to borrowers. This financial transaction can be carried out either directly or semi directly between the lenders and borrowers. The semi direct financing can be performed with the help of financial intermediaries. Commercial banks are the classic example of financial intermediaries serving the public today. They offer more services than the majority of other financial institutions including the expansion of money supply by granting credits to the borrowers. They accept deposits from savings-surplus units (lenders) and grant credits to the savings-deficit units (borrowers). In other words, they play a significant role in the formation and mobilization of internal capital and development effort. Banks involve in assessing the creditworthiness of borrowers and monitoring to ensure that the borrowers do not default in their obligations (Godspower-Akpomiemie, 2012).

The major components of the bank's balance sheet are loans and deposits. The collection of deposit and its mobilization can be considered as two sides of a coin, i.e. an absence of the either can cause an imbalance in the banking system. Both aspects co-exist under favorable conditions, interest rate being the most. Interest rate in recent times has become a sensitive factor in the operation of commercial banks. It is one of the major factors affecting the collection and mobilization of deposits. The widespread notion that commercial banks "borrow short and lend long" implies that a sharp increase in market interest rate may lead to a significant number of banking failures(Flannery, 1981).

Understanding the various variables of profitability of banks is very important as it helps to evaluate the effectiveness of the banks, maintain the government as well as central bank's plan, making of depositor's choices as well as in strategy formulation and implementation for bank managers to achieve the planned goals. Gbadebo and Ogbonna (2019) revealed that bank size, leverage and lending interest rate positively influence the measures of profitability in terms of return on assets and return on equity. Similarly, deposits and interest on deposits also play a crucial role in the profitability of commercial banks. HaddaweandHammood (2020) in their study revealed that there is a significant relationship between deposits and the indicators of profitability.

Khan and Sattar (2014) explained that the variations in the interest rate depress the savings and investment and increase the efficiency of banks' lending. The study showed that there is strong and positive correlation between interest rate and profitability of commercial banks meaning that the increase in the value of interest rate will also result in the increase in profitability of banks and vice-versa. It is very important to understand various roles that bank play in the financial system in theoretical economics and finance. The efficiency of the process from which savings are channeled into productive activities is very important for growth and general welfare. Banks are a part of this process. Banking and financial service industry are globalizing rapidly and experiencing very intense competition in the market place all across the globe not just between the banks, but also between the security dealer, security companies, and credit unions, finance companies, and thousands of other financial service competitors (Rose & Hudgins, 2012).

There are many types of risks arising in the banking system which includes credit risk, operational risk, market risk, foreign exchange risk, interest rate risk, liquidity risk and other risks. Among all other risks, interest rate risk is a major concern for the financial institutions. The increase in interest rates will lead to a high possibility of default in repayment by the corporations and individuals, causing credit risk. Such default in payment could cause liquidity risk as banks may depend upon the loan repayment for the liquidity maintenance which leads to solvency risk ultimately affecting the profit and equity of the banks. Muriithi, Muturi, and Waweru (2016) in their study revealed that interest rate has a negative and significant relationship with bank profitability. The commercial banks also face market value risk due to the change in interest rates. The net worth (owner's equity) is directly affected by the losses in market value of assets caused by interest rate shock as debt holders have senior claims on a firm's assets, while equity holders' claims come afterwards (Cornett & Saunders, 2003).

Market interest rates include treasury bills rate, deposits rate, federal funds rate, loan rate, bank rate, repo rate and the like. There are various factors that cause fluctuations in market interest rates. GDP and exchange rate along with inflation and monetary supply have a significant impact on the market interest rate fluctuations. Lantara (2014) reveal that bank profitability and economic cycle factors like GDP are positively related, but the exchange rate of USD/IDR and profitability are negatively associated. Supply and

demand of credits is another prominent factor in the rise or fall of interest rates in the market. An increase in demand for credit will raise interest rates and vice versa. Conversely, a higher supply of credits will reduce the interest rates and vice versa. Similarly, inflation can be regarded as another determinant of interest rate change. The inflation rate has a positive relation with the interest rate. It is because the lenders will want a higher interest rate in return for the decrease in purchasing power of money they are paid in the future. Likewise, other factors causing fluctuations in market interest rates include monetary policy issued by the central bank, GDP, exchange rate, etc.

Himalayan Times (2020) explained that the recent outbreak of the COVID-19 pandemic affected the global economy in various ways and the Nepalese banking sector is not an exception. The inability to disburse loans has led to very little income for the banking and financial institutions. Loans are the major source of earning interest for the commercial banks. However, at the moment, the financial institutions' recovery rate is declining. The profit for the financial institutions has decreased by 12 percent from 2019 and the failure to raise interest rates has caused a decline in the earnings. Although interest could not be extended due to the lockdown that was ordered due to the pandemic, deposit collection was not really a matter of concern for the banking business as it had been continuously going up. NBA also made a decision to lower the interest rate on both savings as well as fixed deposit accounts limiting the maximum interest at 5.5 % and 8.75% respectively. Likewise, bankers agreed to reduce the premium over the base rate by 1% in an expectation to lower the bank's cost of fund to lower base rate due to which banks will be able to minimize interest rate on its credit products (NEF, 2020). Thus this study focuses on market interest rates involving loan rate, deposit rate, reverse repo rate, treasury bill rate and bank rate and their impact on profitability as ROA, ROE and NIM and determine which determinant of interest rate has more impact on interest rates and ultimately on the profitability of commercial banks.

1.1.1. Brief introduction of sample Commercial Banks

a) Standard Chartered Bank Nepal Limited

Standard Chartered Bank Nepal Limited, which was previously known as Nepal Grindlays Bank Limited came into operation in Nepal since 1987. It was registered as a joint venture operation initially. Currently, the Bank is an important part of Standard Chartered Group which has an ownership of 70.21% in the company among which 29.79% shares are owned by the Nepalese public. Having 15 points of representation, 26 ATMs across the country and more than 531 local staff, Standard Chartered Bank Nepal Limited has been serving its clients and customers via an extensive domestic network. Likewise, the global network of Standard Chartered Group enables the Bank to provide truly international banking services in Nepal.

b) Rastriya Banijya Bank Limited

Rastriya Banijya Bank Limited has been serving its customers for more than half a century. The bank which was fully owned by Government of Nepal then, was established on 10th of Magh 2022 (23 January 1966) under the special statute "Rastriya Banijya Bank Act, 2021" and had operated under "Commercial Bank Act, 2031" until it was re-registered as public limited company on 6th of Baisakh 2063 (19 May 2006). Currently, the Bank operates as "A" class financial institution which is licensed by Nepal Rastra Bank and carries out commercial banking activities as per the provisions of the "Bank and Financial institutions Act 2073," (2017).

c) NIC ASIA Bank Limited

NIC Bank was established on 21st July 1998 which has its antecedents in NIC ASIA. The Bank was afterwards called NIC ASIA Bank after its merger with Bank of Asia Nepal on 30th June 2013. At present, NIC ASIA has established itself as one of the most successful commercial banks in Nepal in terms of capital base, balance sheet size, number of branches, ATM network and customer base. The Bank has 333 branches, 96 extension counters, 74 branchless banking, and 471 ATMs across Nepal with a network covering all major financial centers of the country.

1.2.Statement of the problem

In simple terms, market interest is the prevailing interest rate on deposits which is affected by various forces such as central bank interest rates, the flow of funds in and out of a country, duration and the size of deposits. The rates of interest paid on deposits and other investments that are determined by the interaction of the supply of and demand for funds in the money market are termed as market interest rates (Financial glossary, 2011). Various theoretical and empirical contributions have given the literature on different market interest rates.

The interest rates and profitability of banks are interconnected with each other. Banks could take advantage of the difference between the interests they have to pay to the customers and the interests they can earn from their investments. The spread between the interest income earned on their assets and the interest expenses paid on their liabilities is termed as Net Interest Income. NII comprises of a significant portion of profit of any commercial banks. Due to this reason, banks are involved in offering lower returns to the depositors and lending funds to the borrowers at the highest possible rate of interest. It is measured as NIM which can be obtained by dividing NII by total earning assets. Whenever interest rates rise, the spread between the long term and short term rates also rises eventually leading to the increase in profitability of banks as banks borrow on a short term basis and lend at a long term basis and vice-versa. NIM dynamics and interest rate volatility are positively and strongly related, while inflation risk is considered to be a relevant driver of NIM cross-country differences (López-Espinosa, Moreno, & de Gracia, 2011). Maturity mismatch of banks' assets and liabilities have been shown by interest rates (while performing the function of asset transformation), and the unexpected change in interest rate causes interest rate risks in banks (Delis & Kouretas, 2011).

Since the NII is based on the GAP between interest rate sensitive assets and interest rate sensitive liabilities, it is greatly exposed to interest rate risk. The change in net interest income depends upon the change in interest rate and the GAP. For banks holding a large proportion of their portfolio in long term loans with fixed rate of interest, NII is a major issue of concern (Hanweck&Kilcollin, 1984). The exposure to interest rate risks will lead to refinancing or reinvestment risk on the basis of the direction and change in the level of interest rate (Cornett & Saunders, 2003). In addition to refinancing and reinvestment risk that occur due to the change in rate of interest, commercial banks also experience market

value risk where the rise in interest rates leads to the decrease in the market value of the banks' assets.

Commercial banks are involved in expanding the money supply by making various loans and investments. They attract funds from the savings-surplus units by issuing secondary securities and lend funds to the savings-deficit units by accepting primary securities in return. As the liabilities of the depository institutions are significant component of the money supply (M1, M2, and M3) that impacts the rate of inflation, they play a key role in the transformation of monetary policy from central bank to the rest of the economy (Cornett & Saunders, 2003). This means that commercial banks are such institutions through which actions of monetary policy impact the rest of the financial sector and the overall economy. Deposits are influenced by exchange rates during the time when confidence in domestic currency is very low. Three macroeconomic determinants including growth in GDP, inflation and concentration significantly influence the profitability of commercial banks (Sufian&Kamarudin, (2012).Among all three, GDP is considered as the most commonly used indicator to measure total economic activity within an economy. Likewise, demand and supply of funds, monetary policy of Central Bank, inflation, competition among the financial institutions and the like, also can be considered as the determinants of market interest rates.

So far commercial banks of Nepal are concerned, due to the intense competition between the banks to increase the volume of deposits, loans and investments; they have been working under very insignificant amount of spread which can hardly cover the costs. This is because of the presence of excessive banking and financial institutions in the country. Similarly, frequent fluctuations in the interest rates have changed the habit of individual depositors and have caused a significant influence on the banks' profitability factors including ROA, ROE and NIM.

ROA explains how efficiently the resources or the total assets of the company are used to generate income. A high ROE indicates that the company is more efficient in utilizing its resources. ROE explains how well the owners are doing on their investment. Similarly, NIM explains how much net interest income is earned from total earning assets. Among business cycle indicators, bank profitability and net interest margin (NIM) are positively

and significantly related, while indicators of asset quality, efficiency (BOPO) and credit risk (NPL) had a negative effect on bank profitability (Lantara, 2014).

Thygerson (1995) stated that role of servicing and portfolio risk management is performed by commercial banks. Among various roles, Nepalese commercial banks act as intermediaries between the savers and borrowers; provide savers with investment opportunities and experts in financial management. The activities of Nepalese commercial banks are supervised by the Central Bank of Nepal (NRB). Interest rates have become the major concern of Nepalese Commercial Banks in the recent period after the outbreak of the COVID-19 pandemic. NRB has released the monetary policy for the FY 2020/21 where the repo rate has been reduced from 3.5 to 3.0 percent. The commercial banks of Nepal have been demanding a higher interest rate on repo so as to gain from the interest spread while NRB has been reluctant on doing so. Monetary policy has also announced the long-term repo facility in order to provide additional resources to recover from the economy affected by Covid-19. The weighted average rate of interest of 91 days T-bills were 1.27 percent and weighted average inter-bank rate among commercial banks were 0.35 percent in mid-July 2020. Such rates were 4.97 percent and 4.52 percent respectively in mid-July 2019(NRB, 2020).

Interest rates are highly sensitive to certain factors that are beyond our control involving macroeconomic factors like GDP, inflation rate, policies of the government and regulatory authorities as well as bank business cycle indicators like asset quality, NIM, etc. The nature, timing and effects of any future interest rate fluctuations cannot be predicted. Although there are certain findings, no empirical findings are available using the recent data in the context of Nepal. Also, very few studies have been carried out regarding the relevance of market interest rates, its determinants and impact on the profitability of commercial banks in the context of Nepal. The financial performance analysis of commercial banks in any nation is becoming the matter of interest for research purpose. Due to all these reasons, this study aims to assess the effect of interest rate sensitivity on profitability (ROA, ROE AND NIM) of commercial banks in Nepal with three banks as sample for the purpose of study. It will also examine which determinant of interest rate has a more significant effect on the interest rate and ultimately on profits and net worth of commercial banks. In other words, this study analyses the impact of market interest rate fluctuations on the profitability of commercial banks of Nepal with particular

reference to Standard Chartered Bank Limited, Rastriya Banijya Bank Limited and NIC ASIA Bank Limited.

Therefore, the study is an attempt to answer the following research questions:

1. What is the trend of market interest rates?
2. What is the impact of loan rate, deposit rate, Treasury bill rate, reverse repo, capital adequacy, liquidity and non-performing loan on the performance in terms of profitability of commercial banks?

1.3.Objectives of the study

The major objective of this research is to determine the impact of market interest rate fluctuations in the profitability of commercial banks of Nepal.

The specific objectives of the study are listed below:

1. To analyze the trend of market interest rates.
2. To examine the impact of loan rate, deposit rate, Treasury bill rate, reverse repo, capital adequacy, liquidity and non-performing loan on the performance in terms of profitability of commercial banks.

1.4.Research Hypothesis

Based on the above objectives and research questions, the following set of hypothesis is tested in this study to examine the relationship between market interest rates and profitability:

H1: There is a significant impact of Loan Rate on the profitability of commercial banks measured by ROE, ROA and NIM.

H2: There is a significant impact of deposit rate on the profitability of commercial banks measured by ROA, ROE and NIM.

H3: There is a significant impact of Treasury bill rate on the profitability of commercial banks measured by ROA, ROE and NIM.

H4: There is a significant impact of Reverse Repo rate on the profitability of commercial banks measured by ROA, ROE and NIM.

H5: There is a significant impact of Capital Adequacy on the profitability of commercial banks measured by ROA, ROE and NIM.

H6: There is a significant impact of Liquidity on the profitability of commercial banks measured by ROA, ROE and NIM.

H7: There is a significant impact of Non-Performing Loan on the profitability of commercial banks measured by ROA, ROE and NIM.

1.5. Rationale of the study

Changes in market interest rates play a significant role in a bank's performance. The success of any organization largely depends upon how properly the organization manages the risk. Effective market risk management is very essential to the long term success of any banking organization. If such risks are not managed on time, they may lead to banking failure. Therefore, the possible risks in the banking sector are of major concern to the various stakeholders including the top level management who operate the banking activities, depositors whose funds are being used and regulatory bodies who are responsible for the protection of the banking system.

Various studies have provided different data on the positive as well as the negative impact of market interest rate fluctuations in the profitability of commercial banks. Interest rate risk management is an important factor to look for in the banking sector to maintain and improve the level of profitability. This study attempts to analyze the market interest rate determinants and their impact on the bank's profitability. Thus, this study could be useful to those who have a keen interest in the Nepalese economy and banking sector. This research will as well make an empirical contribution to the discussion of the bank's profitability, overall wealth performances, and eventual contributions to the economic development. If banks, non-bank businesses, and individuals have improved understanding, assessment and evaluation of market interest rates, they would be better equipped to make investment decisions that will be beneficial to them and the economy in general.

1.6.Limitations of the study

This study is conducted for the partial fulfillment of Masters Degree on student sector. It aims to analyze the impact of market interest rate fluctuations on the profitability of Nepalese commercial banks. On the basis of available data, three banks are selected as sample banks for the purpose of research. The limitations of the study can be summarized as follows:

- i. The topic of this study can be used in various financial institutions but this study is confined within the commercial banks of Nepal only.
- ii. The study is based on the data of recent five years from 2015/16 to 2019/20 only. However, more years of data can be taken for the purpose of study so as to obtain more precise results.
- iii. This topic area is very large and the affecting factors are more but all the factors are not considered for the purpose of study. Also a larger sample would help to obtain better results; however, only three sample banks out of 27 commercial banks are taken as sample for the study.
- iv. The study doesn't include other determinants of bank profitability like ownership structure, taxation, and various regulations, legal and institutional indicators which might be correlated with interest rates.

1.7.Organization of the study

The remainder of this study has been organized as follows:Chapter two contains the review of literature specifying the factors that affect profitability with special focus on market interest rates.Chapter three states the research design, methodology and sampling design that are used for the purpose of this study.Chapter four contains the presentation and analysis of data which addresses the questions that are proposed for the study and how the interpreted results address and answer such questions.Finally, chapter five provides the summary, conclusions drawn about the study in relation with the research questions and the implications of the study.

CHAPTER II- LITERATURE REVIEW

This chapter consists of conceptual framework of the study and deals with the review of previous studies associated with fluctuation in market interest rates and its impact on overall profitability of commercial banks. It also shows the presence of gaps in understanding the determinants of market interest rates and the impact of fluctuations in such interest rates on the financial performance of Nepalese commercial banks. Thus, this paper contributes to the literature by providing empirical evidence regarding some key factors that influence the market interest rate associated with the bank performance. This chapter can be regarded as the basis for developing a theoretical and conceptual framework from which hypothesis can be formed for testing. It also enables us to know about the past development of a particular problem through the study of literatures that are found in the form of thesis that are written earlier, books, articles, journals and any other publications related to the subject matter published by a person or an organization. It is divided into three sections. The first section presents the conceptual review of the study where the relevant variables for the study are defined and their relationship is explained in a visual format. Similarly, the second section provides an in-depth review of past studies related to market interest rates all around the globe. The main purpose of reviewing the literature is to develop some expertise in one's area. Also, literature is reviewed to see what new contributions can be made and to receive some ideas for developing research design. Finally, the third section presents research gap of the literatures reviewed in the previous section.

2.1. Conceptual review:

Fluctuations on market interest rates and the impact of such fluctuations on the revenue, cost and profitability of commercial banks has been a major concern for the economists as well as the policymakers. This is because the financial market conditions in the whole world seem fairly bleak in the recent times especially with the onset of the global COVID-19 pandemic whereby, the financial sector of Nepal is not an exception as it has also been severely affected (The Kathmandu Post, 2020).

Interest rate measures the amount of money paid by a borrower to lender in return of the use of resources for some period of time (Fabozzi & Modigliani, 2003). Interest rates can be either nominal or real out of which nominal rate is the one not corrected for inflation while, real interest rate incorporates the effect of inflation. The market interest rate is the interest rate offered most commonly on deposits in banks, other interest bearing accounts, as well as loan; it is determined by the supply and demand for credit (Farlex, 2009). Market interest rate largely depends on various factors or determinants such as demand and supply for credit, competition in the market, and different economic factors, such as monetary policy of the government, inflation rate, expectation of investors, etc.

It is a prime matter of concern for the commercial banks to determine whether the rate of interest may be expected to go higher or lower than today's level, upto what extent it may go, and how long the movement might take. It is because the movement of interest rate is a matter of concern to the financial institutions as such movement affects decision making, growth and performance of any financial institution (Madura, 1989). Any changes in the income as well as the interest rate expectations affect the income and expenditure of financial institutions. A positive NIM is required for a financial institution for a long term to remain in the business of borrowing and lending money. But the maintenance of a positive net interest margin has been difficult for a number of financial institutions in the recent years, due to volatile interest rates as well as other factors like restrictive regulations, reckless management etc.

Hanweck and Kilcollin, (1984) explained four factors that determine the effect of a change in interest rate on banks' profitability. First is the proportion of assets and liabilities. When interest rate increases, the higher the liability proportion relative to assets, the lower will be the NIM. Secondly, there is a response of new rates of asset and liability to changing interest rate. The interest rate spread between the assets and liabilities may increase or decrease with the increase in interest rate ultimately increasing or decreasing the NIM. Thirdly, the portfolio of assets and liabilities may shift with the change in interest rate. For example, low interest rate on deposits and loans may be renegotiated at current rate. Fourthly, the change in interest rate may change the size of a bank's portfolio thereby affecting NIM.

The impact of interest rate on profitability can be summarized by its “gap”. GAP can be defined as the difference between interest rate-sensitive assets mainly loans and interest rate sensitive liabilities mainly deposits (Rose et al, 1995). If interest rates are expected to rise under strategy of aggressive management, financial institutions having positive gap will experience rise in profit. Net income will increase as revenue from loans will increase more than their cost. If financial institutions with negative gap expect interest rate to rise, they have to adjust their portfolio like, shortening their assets’ maturity, through sales of long term securities and purchase of short term securities. The opposite adjustment of portfolio is required in case of expectations of falling interest rates. Management will shift to negative position of gap so as to benefit from falling interest rate (Rose et al, 1995). The falling rate of interest may be accompanied by recession which might cause slow growth in loans and increase in loan losses. Profitability tends to reduce for all banks (Hanweck and Kilcollin, 1984).

2.2. Review of previous studies:

The review of previous studies has been presented in a chronological order and has been categorized into two parts:

- a. Review of major literatures
- b. Review of major Nepalese studies

a) Review of major literatures

Commercial banks are usually involved in borrowing short and lending long. The statement that commercial banks borrow short and lend long indicate that the sharp increase in market interest rates might lead to a significant number of banking failures. Flannery (1981) used regression models to test whether the fluctuations in market interest rates have a significant impact on the profitability of banks. The study developed method to estimate maturities of average asset and liability for a sample of large money center banks and revealed that there is no significant impact of market interest rate fluctuations on bank profitability as large banks are involved in effectively hedging of the market interest rate risk by assembling asset and liability portfolios with those having similar average maturities. It is often stated that the profitability of financial institutions which borrow short and lend long is restricted at times of rising interest rates. Such statement has been a matter of concern for smaller banks because smaller banks are thought to hold

a large proportion of their portfolios in long term fixed rate loans as a result of which they face interest rate risk. Hanweck and Kilcollin (1984) examined the impact of changing interest rates on the profitability of different size classes of banks and found that small commercial banks as a group experienced increased profitability as compared to large banks during the period of rising interest rates.

Interest rates can be of two types- nominal and real. The interest rate not corrected for inflation is termed as the nominal interest rate. It is related to the interest on the amount of money lent. On the other hand, the real interest rate is the inflation adjusted interest rate which is measured in terms of purchasing power of money. The two rates are connected by a simple relation called Fisher Effect, which says that real interest rate is measured as nominal interest rate minus expected inflation rate, as market interest rates are affected by an expectation about future inflations (Kaufman, 1986).

Demirgüç-Kunt & Huizinga (1999) examined the determinants of interest margins and profitability of commercial banks and revealed that various determinants cause the differences in interest margins and profitability of commercial banks some of which include bank characteristics, explicit and implicit bank taxation, macroeconomic conditions, deposit insurance regulation, overall financial structure and various other legal and institutional indicators. However, other determinants of profitability and interest margins like ownership, financial structure, corporate taxation and the legal and institutional settings are not taken into consideration for study in the literature. The study analyzed the impact of overall banking environment and bank characteristics in the functioning of banks, reflected in interest margins and profitability of banks on the basis of comprehensive dataset across countries. Various institutional factors such as law, order and corruption, indices of credit rights and differences in financial structure directly affect interest margins and profitability of banks in developing countries as compared to developed countries. The results of the study showed that capitalization and profitability are positively related while reserves and profitability are negatively related. They suggest that high bank asset to GDP ratio and a low market concentration ratio cause low profit and margins, controlling for differences in leverage, bank activity and the macroeconomic environment; and foreign banks have higher profit and interest margins in comparison to domestic banks especially in the context of developing countries while the case is completely opposite in case of developed countries. Likewise, various other institutional

factors including law, order and corruption, indices of credit rights and the differences in financial structure have significant effect on the interest margins and profitability of developing countries as compared to the developed countries. The banking system all across the globe differ on the basis of size and operation due to which commercial banks have to face various macroeconomic factors, deposit insurance regimes, different implicit and explicit tax policies, financial market conditions, various legal and institutional policies and so on, which affects the overall financial performance of the bank.

The financial products that are developed by commercial banks so as to manage risk such as interest rate swap, interest rate options, interest rate agreements, forward contracts and currency swaps also yield income. Banks can sell such products to generate commission or spread income. Interest rate is a form of collecting and lending money. In other words, the cost of holding period of a specific time or the compensation for the use of borrowed funds can be referred to as interest rate. The price paid by a borrower or debtor to any lender or creditor to use resources during some time period is measured by interest rates (Fabozzi & Modigliani, 2003).

Commercial banks are the largest group of depository institutions in size. The significant proportion of funds of depository institutions including commercial banks depends upon the deposits from their customers. They perform functions similar to those of savings institutions and credit unions, i.e. they accept deposits (liabilities) and make loans (Cornett & Saunders, 2003). Commercial banks have to face various types of risk while managing loans and individual securities, the most significant out of all being interest rate risk. Interest rate risk can be termed as the negative effects that could arise on the financial result and capital of the bank caused by the fluctuations in market interest rates. Since the present value of future cash flows changes due to the change in interest rates, it directly affects the value of the bank's assets, liabilities and off balance sheet instruments. Due to this reason, management of interest rate risk has become very significant. In a study of net exposure to interest rate risk in a study, a simulation based driver-driven approach was developed so as to estimate the impact of fluctuations in interest rates on the net worth of Indian banks during a period of two years and the interest rates that drive changes in deposit and prime lending rates (PLR) was derived. Then after, the study used Monte Carlo simulation and multiple regressions on these driver rates so as to obtain simulated shocks to PLR and deposit rates. For a given change (1%), the effect of the

shift in volume and composition of assets and liabilities is also included in interest rate risk (Saha et al., 2009).

Kassim et al. (2009) examined the impact of monetary policy shocks on the conventional and Islamic banks in a dual banking system environment in Malaysia. The responses of the conventional banks is expected to be different with that of Islamic banks in view of monetary policy shocks because of the nature of the Islamic banks which consider interest free instruments only. The study covered the data from January 1999 to December 2006 of Malaysian banks and its main objective was to determine the sensitivity of Islamic banks through the analysis of the impact of changes in interest rate on the financing and deposits of the banks. The analysis was also conducted on the conventional banks along with the Islamic banks so that the unique risks confronting the Islamic banks could be determined. The results of the study reveal that the balance sheet items of Islamic banks are relatively more sensitive to the change in monetary policy. On the other hand, the balance sheet items of conventional banks especially the conventional loans are insensitive to the change in interest rate. This means that the impact of monetary policy is more destabilizing on Islamic banks as compared to the conventional banks. The study could be applied on the risk management practices of Islamic banks, especially in dual banking system like that in Malaysia.

Under the monetary aggregate targeting regime in China, a move in the short term money market interest rate has not been able to reflect the changes in macroeconomic variables. In other words, the response of the central bank's benchmark interest rate to macroeconomic fluctuations fails to transfer effectively to the money market. The weak link between the short-term interest rate and the macro-economic variable implies that China cannot use the short-term money market interest rate as its operation target. An institutional reason for this failure is the existence of two cut-off separate interest rate systems: the central bank interest rate system and the commercial bank loan and deposit interest rates system (Sun, Gan, & Hu, 2010). Their paper utilized VAR techniques to examine the relationship between a policy related variable and selected macro-variables in China. Johansen's co integration tests failed to find a moving equilibrium among the related variables. Based on a VAR model in first differences, they found that an unexpected temporary one-off shock to the change in the seven-day money market interbank borrowing rate does not have significant influence on GDP changes but a

significant influence on price level changes in a “wrong” direction. Empirical testing demonstrates that the seven-day Repo rate has an insignificant influence on both GDP changes and on the price level changes. Furthermore, the relationships between monetary aggregate (M2) and short-run money market interest rates suggested that the short-run interest rates do not have significant influence on the monetary aggregate. Therefore found that short-run money market interest rates are ineffective as a monetary policy-operating objective.

Borrowing and lending funds is an integral function of commercial banks. However, the composition of assets and liabilities differ. The activities, structure and composition of assets and liabilities of the banks differ on the basis of the size of banks. Anbar and Alper (2011) in their study examined the bank specific and macroeconomic determinants of the profitability of banks in Turkey for a period of nine years where profitability was measured by two proxies- ROA and ROE. The study revealed that the size of the assets has a positive and significant impact on bank profitability, i.e. large banks have a higher ROA and ROE. But, the volume of credit portfolio and loans that are under follow-up have a negative and significant impact on the ROA of commercial banks. Also, the non-interest income ratio has a positive and significant relationship with the efficiency of bank performance, i.e. ROA. Bank loans are considered as the major source of income as it provides interest income and have a positive impact on the performance of banks but a negative relationship with profitability. Considering the macroeconomic variables, the profitability of banks (measured by ROE) is positively affected by real interest rate only. The profitability of banks can be increased by increasing bank size and non-interest income and decreasing credit/asset ratio and the diversification of banking activities positively influence returns. The other bank specific factors (like liquidity, deposits to total assets, net interest margin and capital adequacy) as well as macroeconomic factors (like real GDP growth rate and inflation) do not have important effect on the profitability of banks.

Felicia (2011) used regression analysis to investigate the determinants of commercial banks lending behavior in Nigeria. The study discovered that commercial banks deposits have the greatest impacts on their lending behavior. Deposit money banks are the most important savings, mobilization and financial resource allocation institutions. Consequently, these roles make them an important phenomenon in economic growth and

development. In performing this role, it must be realized that banks have the potential, scope and prospects for mobilizing financial resources and allocating them to productive investments and in return promote their performance. Therefore, no matter the sources of the generation of income or the economic policies of the country, deposit money banks would be interested in giving out loans and advances to their numerous customers bearing in mind, the three principles guiding their operations which are, profitability, liquidity and solvency.

López-Espinosa et al. (2011) conducted a study on the analysis of the determinants of NIM that led to financial crisis, role of accounting standards across banking industries of 15 developed and emerging economies and used multi-way cluster estimation to control for cross-sectional and time-series dependence in banking and macroeconomic variables. The study showed that introducing IFRS led to low variations in NIM. NIM dynamics and interest rate volatility are positively related, while inflation risk is considered to be a relevant driver of NIM differences across countries. Olokoyo (2011) investigated the determinants of commercial banks' lending behavior in Nigeria. From her findings, commercial banks' deposits have the greatest impact on their lending behavior. The study then suggests that commercial banks should focus on mobilizing more deposits as this will enhance their lending performance and should formulate critical, realistic and comprehensive strategic and financial plans.

Godspower-Akpomiemie(2012) examined the determinants of interest rates and the effect of interest rate sensitivity on the profitability and net worth of commercial banks and found that the fluctuations in the repo rate have a statistically significant positive effect on profitability of small sized banks rather than the large ones. Such fluctuations also directly affect the net worth of the commercial banks. On the other hand, the macroeconomic determinants of interest rates such as inflation, the rate of money supply and uncertainty do not directly affect the profitability of commercial banks, but have significant effect on the net worth of commercial banks, especially of that of small banks. The study also found that among various internal factors affecting profitability and net worth of commercial banks, the liquidity ratio is the most significant as compared to capital ratio, competition and non-performing loan. From the interest rate model, the study showed that all the macroeconomic factors are significant determinants of changes in repo rate out of which uncertainty has the highest influence on interest rates. From the

profit model, it was found that profit of commercial banks of South Africa are significantly increased by the changes in repo rate, especially on small banks in comparison to large banks. Although the macroeconomic factors, being the important determinants of repo rate do not have significant effect on profitability of commercial banks, such factors reduce the profitability of commercial banks but the effect is not statistically significant. The net worth model revealed that repo rate significantly affected the net worth of commercial banks in South Africa but a non-significant reduction effect was noticed when big and small banks were separately considered for estimation. Again, as in the interest rate model, uncertainty and inflation had a significant increase effect on the net worth of the small banks, as opposed to the non-significant reduction effect by the repo rate. Since, the study showed that macroeconomic factors had a significant effect on net worth of the South African banks (especially the small ones), they could focus on predicting and hedging the macroeconomic factors that determine interest rates instead of interest rates themselves.

The profitability of commercial banks is significantly influenced by market risk. There is a negative relationship between market risk and financial performance of commercial banks both in the short run as well as in the long run as a result of which the increased exposure of bank to market risk involving interest rate, leverage and foreign exchange exposure reduces bank profitability (Muriithi et al., 2016). Due to this reason, the study suggested the Kenyan commercial banks to reduce interest and foreign exchange risk exposure through the use of various financial derivatives and asset securitization and continuous monitoring of financial leverage so as to improve profitability and reduce the financial risk. The study took into consideration 43 registered commercial banks in Kenya between year 2005 and 2014 where interest rate risk, financial leverage and foreign exchange exposure were used to measure market risk; and ROE was used to measure the financial performance of the commercial banks.

Islam et al. (2017) found that asset size and Net Interest Margin ratio had no significant effect on the profitability but, non-performing loans significantly affected the profitability of commercial banks. The study also showed that the investment in shares and debentures of private sectors and diversification of banking activities positively affected ROE and overall profitability. However, diversified activities are profitable only if such activities involve low risk income streams rather than highly volatile trading activity having high

risk. The study used multiple regression analysis so as to determine the significant determinants of profitability of 11 private commercial banks of Bangladesh and revealed that interest income was the major source of income for the banks. Also, higher investment led to high profitability and diversification of banking activities had a significant influence on the profitability of the commercial banks.

A study on the impact of interest rate spread on bank profitability in Ghana measured interest rate spread using net interest income (IntSp) and net interest margin (NIM); and bank profitability by Return on Assets (ROA) and Return on Equity (ROE). Interest rate spread and bank profitability are positively and significantly associated with one another and with profit as motivation, banks will only reduce interest rate spread if it reduces their profitability but the evidence collected by the study show that banks charge higher interest margin on lending funds in comparison to deposits due to the higher demand for loans than supply so as to maximize profitability. In other words, banks will increase NIM by increasing interest income and decreasing interest expense. Also, higher ROA will encourage banks to increase interest margin in order to cover the increase in operating costs (Musah et al., 2018).

Tumwine et al. (2018) examined that liquidity, equity capitalization, lending out ratio, market power, operational efficiency, concentration, public sector borrowing and private sector credit have a significant impact on interest rate trends. The banks having ability to have stable and adequate equity capital causes the increase in liquidity to finance long and medium term demands and provide sufficient capital so as to finance modern technology for efficient gains. The increase in in-branch networks lead to the increase in competition within the banking sector and sharing of information would cause the banks to lower the interest rate. Despite of the increase in competition for funds with the private sector through public sector borrowing, it boosts the development of infrastructures and distributes incomes from those having excess income to those who lack the same. The findings of the study revealed that there is a significant positive impact of equity capital, concentration, liquidity and reserve requirement on interest rate. On the other hand, there is a significant negative impact of capitalization, operational efficiency, lending out ratio, public sector borrowing, market power low concentration and private sector credit on the interest rates of banks and financial institutions.

Alayi et al. (2020) examined the relationship between interest rates of loans with income and inflation in Azerbaijan considering the adjustments to the framework of liquidity preference and found that credit interest rates given in USD, are determined by GDP, money supply, exchange rate and household savings. Also, nominal income, inflation and loan interest rates are statistically significant neither in AZN nor in USD. The study does not extrapolate the assumption of positive correlation of income and price level with rates of interest (of Keynesian economics) with a minor modification of interest rates in case of Azerbaijan. The increase in savings of money by the households cause the financial institutions to incentivize customers to take loans by determining interest rates at low rates as the increase in savings of the customers plummets demand for extraction of loans in case of Azerbaijan. Due to the presence of centrally planned economy to some level in Azerbaijan, the network of Keynesian liquidity preference might not be applicable in case of Azerbaijan.

Hossain (2020) examined the determinants of profitability and their impact on profitability of commercial banks of Bangladesh through the use of multiple regressions in their study. The findings of the study revealed that the net interest margin ratio (NIM), Asset size (LOGA), the ratio of operating expense (OPEX) had a significant impact on the dependent variable of the study (ROE). Interest income is considered as the major source of income that any commercial bank earns. The size of bank assets and operating expense ratio have a significant negative relationship with return on equity (ROE) as the increase in asset size lead to the increase in the level of inefficiency and bureaucratic problems which ultimately lead to the decrease in ROE. Banks also engage in various other activities like providing credit cards, house loan, green banking, student loan and the like with a motive to achieve growth in their revenue. The study found that the private commercial banks of Bangladesh are dominant when profitability and market share are concerned and they provide significant employment opportunities for the country. It is very important for the commercial banks to follow the policy of diversification of banking activities which involves maintaining a diversified portfolio while providing loans to customers and focus on collecting loans with a view to reduce the non-performing loans of the banks. Also, minimum assets are to be kept by the banks for their operation and strict policies and regulations should be imposed for the proper distribution, monitoring and collection of loans. This helps to promote efficiency and better financial performance and lead to a sustainable growth in the banking sector.

b) Review of major Nepalese studies

There has been a rapid growth in Nepalese financial sector in the last decade. This growth of financial sector has been observed in all sectors: number of institutions, financial products, technological application and integration to the global financial market. NRB has been regulating and supervising as well as playing a catalytic role in the development and promotion of the banking sector in such rapidly changing financial sector environment of Nepal. It is always a challenge to promote economic growth along with a sound banking system in Nepal. The Nepalese economy is passing through the stage of a low economic growth, high inflation, high consumption and low savings. The core productive sectors of Nepal such as agriculture, industry and infrastructure are greatly affected as they have been experiencing low investment due to low business confidence and lack of comfortable investment environment. Thus it is a challenge to channelize resources towards such productive sectors in order to restore the overall economic health and sustainability of banking sector. The bank supervisors all across the world have gained a huge lesson from post-financial crisis. It is very necessary to make use of the lessons learnt from the problem of mature economics and strengthen our system by implementing such lessons in the context of growing financial system like that of Nepal.

Shrestha (2011) investigated that the banking sector in Nepal is facing with the danger of liquidity crisis, inflated interest rate, declining deposits and danger of real estate collapse. Since the second half of the fiscal year 2009-10, the problem of the liquidity started which has affected the inter banking lending rate. In spite of higher interest rate provided by commercial bank in the deposits, it still fails to attract the depositors. Nepal Rastra Bank has mentioned that the deposit from commercial banks is diverted into class B and C financial institutions which have caused decrease in deposits in commercial banks. Besides the decline in deposits, another problem that banking sectors were facing is to recover the loans given or provided to the realty sectors. Decrease in transactions of realty sector is seen since Nepal Rastra Bank stopped bank loans for the realty second in the second half of the fiscal year 2009-10. Nepal Rastra Bank limited the lending for the housing sector to 25 percent that of realty sector to 10 percent through economic plan. On

the other hand, bank is also facing problem to keep up profitability. The profit of banks has come down due to narrowing margin and extreme rivalry among BFI. Bankers are in disagreement that the recent procedures on service charge have forced them to keep two percent difference in the interest rates i.e. bankers are forced to intensify interest on normal deposits and subsequently increase interest on loans.

Interest rates are associated with the dealings of market needs and supplies to be precise money that is borrowed and lent. The money is borrowed for the desires of businesses purposes, financial expenses for the development purposes by the government and expenses for household activities. The money available in the bank to let the loan depends upon the amount that comes into banks and other financial sectors through means of consumers and into financial markets. So, the dealings between the need of money to be borrowed and the availability of money to supply determines the level of interest rates. If any of these factors get affected, then this will cause direct impact on interest rates.

Gaire (2012) examined the real interest rates and savings behavior in Nepal during the period of 1975 to 2010 on the basis of the annual data published by Nepal Rastra Bank. The findings of the study showed that the average real interest rate for the period was as low as 1.32%. Also, there is long run relationship between savings behavior and real interest rate in Nepal. Likewise, correlation analysis was conducted so as to measure the degree and direction of relationship between savings and real interest rates and the estimated correlation coefficient showed that real interest rates have a strong and positive correlation with gross domestic savings ratio as indicated by statistically significant result. In the same way, the growth of bank deposits is also affected by the real interest rate but in a very negligible amount. In other words, real interest rate has a very weak connection or relationship with the growth of bank deposits which is represented by the statistically insignificant coefficient of correlation. This might be because of the huge influence of the inflow of remittance in the gross national savings. Due to this reason, the manipulation of interest rates so as to influence the bank deposits is not considered very practical in the context of Nepal. However, the gross domestic savings could be increased by trying to maintain a competitive and positive interest rate by the government as compared to that of other neighboring countries.

Bhattarai (2015) examined the determinants of loan rate of the commercial banks of Nepal through the analysis of data of 5 sample commercial banks for a period of 6 years (2010 to 2015). The study used three regression models, i.e. pooled OLS model, random effects model and fixed effects model for the purpose of the study. Lending rate was used as the dependent variable for the study. Likewise, operating cost to total assets ratio, profitability measured by ROA, deposit interest rate and default risk were the explanatory variables. The results of the study reveal that there is a significant positive impact of operating costs to total assets ratio, default risk and profitability measured by ROA on the lending rate of commercial banks. On the other hand, there is a negligible impact of deposit rate on lending interest rate. Also, operating costs to total assets ratio, profitability (ROA) and default risk could be considered as the major determinants of the lending rate of commercial banks.

Shrestha (2016) examined the determinants of interest margin of 18 commercial banks of Nepal on the basis of data collected from the supervision reports of banks published by Nepal Rastra Bank as well as the annual reports of selected sample commercial banks. The study used the interest margin in terms of net interest income to average earning assets and net interest income to total assets as dependent variables. Likewise, it used credit risk, capital adequacy ratio, liquidity ratio, efficiency ratio, return on assets, assets growth ratio, GDP growth rate, interest rate and inflation as independent variables. The significance and importance of net interest margin in the commercial banks of Nepal was tested through the use of regression models. The study revealed that there is a positive relationship between net interest margin with liquidity ratio, capital adequacy ratio, interest rates, credit risk and return on assets. This implies that the increase in capital adequacy and liquidity ratio would lead to the increase in the net interest margin and vice-versa. In the same way, the increase in credit risk cause to increase the net interest margin. Similarly, the increase in return on assets and interest rates also lead to the increase in the net interest margin. On the other hand, there is a negative relationship between net interest margin and efficiency ratio, GDP growth rate, assets growth ratio and inflation. This implies that the increase in assets growth ratio and efficiency ratio will cause to the decrease in net interest margin. In the same way, the increase in GDP growth rate will lower the net interest margin. Similarly, the increase in inflation will cause to decrease the net interest margin. The study shows a positive beta coefficient between liquidity ratio, capital adequacy ratio, return on assets, credit risk and interest rate with

net interest margin. On the other hand, the study shows a negative beta coefficient between efficiency ratio, GDP growth rate, assets growth ratio, inflation and net interest margin. Also, beta coefficient is significant for credit risk, liquidity ratio, interest rate and capital adequacy ratio at 5 percent level of significance.

Bhatt and Verghese (2018) examined the relationship between the liquidity and profitability of Nepalese commercial banks with 14 banks as a sample using the annual reports of the banks for the period of 2008 to 2017. The study used return on assets and net profit margin as the indicators of profitability. On the other hand, liquidity was measured in terms of liquidity ratio, investment ratio and capital ratio. The study explained the main features of data collection in quantitative terms using inferential statistics as well as linear regression analysis for data analysis. The study revealed that more than 49 percent of profitability of banks measured by net profit margin and return on assets is predicted by liquidity variables and estimated panel data model of liquidity and profitability management for the banking sector of Nepal which presents useful information for the role of liquidity in the profitability. Also, liquidity ratio has an insignificant and positive relationship with return on assets. In the same way, investment ratio and capital ratio have an insignificant and negative relationship with return on assets. Likewise, net profit margin and liquidity and investment ratio are insignificantly positively related while, capital ratio and net profit margin are significantly negatively related. The results of the study revealed that liquidity measures do not have a statistically significant impact while determining Nepalese commercial banks' profitability except the capital ratio.

Budathoki and Rai (2020) examined the impact of specific factors like assets quality, assets diversification, capital adequacy and operating efficiency on the profitability of the commercial banks using the bank scope data of 8 commercial banks during the period of 2002 to 2016. The study considered 96 observations for the purpose of study and used least squares model for the data analysis. The findings of the study revealed that three predictor variables—assets quality, operating efficiency, and capital adequacy ratio have a significant effect on bank profitability. But such diversification of predictor variable does not have a significant effect on the profitability of the commercial banks. The results of the study provide a basis for the bankers as well as policymakers in order to take effective actions so as to improve the profitability of the commercial banks.

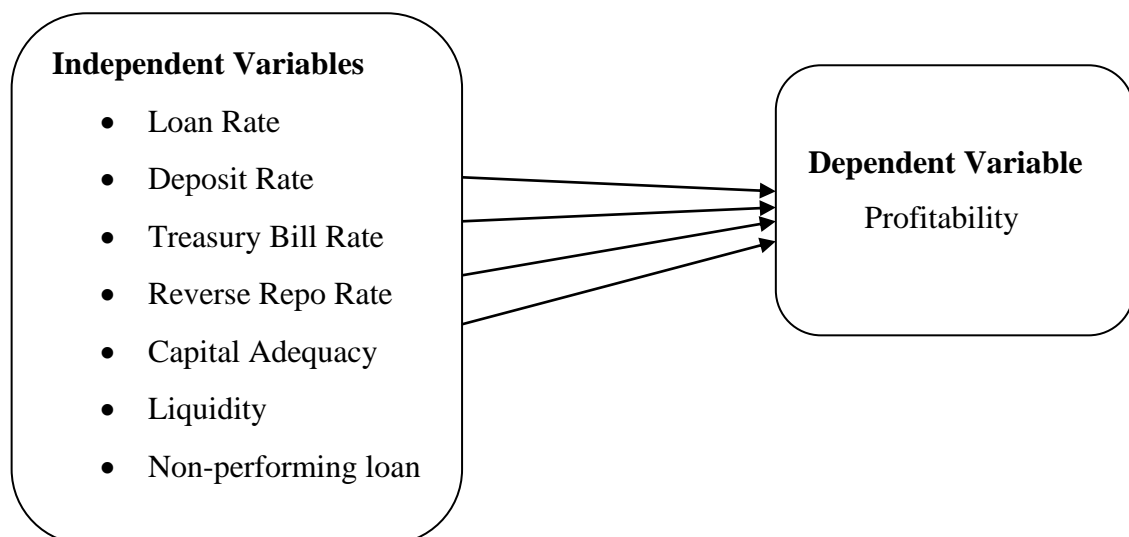
2.3. Research Framework and definition of variables

2.3.1. Research Framework

The impact of market interest rates on the revenues, costs, and profitability of commercial banks has increasingly concerned economists and policymakers as financial market conditions have become more volatile in recent years. The research framework clarifies the relationship between the dependent and independent variables along with control variables that are taken for the study. On the basis of the hypothesis development, theoretical underpinnings and review of literature, a conceptual model indicating the relationship between market interest rates and financial performance of commercial banks has been developed. The figure below is the conceptual model or framework that shows the impact of market interest fluctuations on the profitability of Nepalese commercial banks. In the figure, financial performance or profitability is measured by three proxies, i.e. ROA, ROE and NIM. The explanatory variables that affect the financial performance are Loan Rate (LR), Deposit Rate (DR), Treasury Bill Rate (TBR), Reverse Repo Rate (RRP) and control variables, viz, Capital Adequacy (CA), Liquidity Ratio (LQ) and Non-Performing Loan (NPL).

Figure 2.1: Schematic Diagram of Factors Influencing Profitability

The above figure shows the theoretical framework of the study. Different Market Interest Rates loan rate, deposit rate, treasury bill rate, reverse repo rate and bank rate along with control variables capital adequacy, liquidity and non-performing loan are independent variables. All these variables are expected to determine the profit.



2.3.2. Definition of Variables

The independent variables of the study are defined as follows:

- i. **Loan rate:** It is the rate at which banks lend and borrow from each other. Loan rates differ on the basis of the purpose and type of loan. It is denoted by LR and is applied in many countries to indicate an interest rate used by the commercial banks. The term loan rate initially represented the interest rate at which bank provided loans to their favored customers, especially those with good credit. However, this is no longer always the case. Some variable interest rates might be represented as a percentage above or below the prime rate. Average Loan rate of the last five years from the year 2015 to 2019 was taken from the annual report of Nepalese commercial banks.
- ii. **Deposit rate:** Deposit rate, also known as funding rate is the rate at which depositors are provided with an amount for keeping money with the bank. It is denoted by DR. Deposit accounts include certificates of deposit, savings accounts and self-directed deposit retirement accounts.
- iii. **Treasury bill rate:** The rate that an investor earns on the instruments used by the Government (Treasury bills and Treasury bonds) to borrow funds from its own currency is called Treasury bill rate. In the context of Nepal, T-bills are the mostly used short term money market instruments issued by the Public Debt Department of the Nepal Rastra Bank on behalf of the Nepalese government to fulfill its short term financial requirement. It is one of the safest securities since it has zero default risk and is also the most marketable or tradable security in Nepalese money market. The most common type of T-bill used in Nepal is the 91-days, 182 days and 394 days. 91 days Treasury bill rate is taken for the purpose of this study. It is denoted by TBR.
- iv. **Reverse Repo Rate:** Under Reverse Repo, NRB borrows from the Commercial banks with the objective of mopping up excess liquidity from the system. It is designed to withdraw liquidity. The reverse repo rate is the rate at which banks can park surplus funds with reserve bank, while the repo rate is the rate at which the

banks borrow from the central bank. It is mostly done when there is surplus liquidity in the market. This is the rate at which NRB lends money to other banks and financial institutions.

- v. **Capital Adequacy:** Funds contributed by the owners of a financial Firm. Bank capital is a cushion that prevents bank failure. In order to maintain Capital, A bank maintains reserves to lessen the chance that it will become insolvent. Banks also hold capital to meet capital requirements. The Basel Committee on Banking Supervision sets minimum capital requirements- the ratio of bank capital to risk weighted assets. FDIC created a new capital model as capital-asset ratios since the default on loans came to expose the greatest risk instead of deposit withdrawals (Karlyn, 1984). To gauge the capital adequacy, bank supervisors currently use the capital-risk asset ratio. The adequacy of capital is examined based upon the two most important measures such as Capital Adequacy Ratio (CAR) or Capital to Risk-weighted Assets ratio. It is denoted by CA.

- vi. **Liquidity:** There should be adequacy of liquidity sources compared to present and future needs, and availability of assets readily convertible to cash without undue loss. The fund management practices should ensure an institution is able to maintain a level of liquidity sufficient to meet its financial obligations in a timely manner; and capable of quickly liquidating assets with minimal loss. The liquidity expresses the degree to which a bank is capable of fulfilling its respective obligations. Banks makes money by mobilizing short-term deposits at lower interest rate, and lending or investing these funds in long-term at higher rates, so it is hazardous for banks mismatching their lending interest rate (Duttweiler, 2011). It is calculated as: Net Liquid to Total Deposit. It is denoted by LQ.

- vii. **Non-Performing Loan:** This class of loan is subcategorized into following groups:
 - a. Sub-standard Loan: Overdue by 3-6 months;
 - b. Doubtful Loans: Overdue by 6 to 12 months;
 - c. Loss Loans: Overdue by more than 1 year, Loans not secured by collateral, Debtor bankrupted or has been declared to be bankrupt; debtor disappeared or not identified; In case non-fund based facilities such as purchased or discounted bills and L/C and guarantee which have been converted into fund-based loan (forced loan), are not recovered within ninety days from the date of their

conversion into loan; In case misuse of Loan; A case is pending at a court under the recovery process; Providing loan to a debtor who has been enlisted in the black-list of Credit Information Bureau Ltd; The Project/business is not in a condition to be operated or project or business is not in operation ; The credit card loan is not written off within 90 days from the date of expiry of the deadline; In case of expiry of the deadline of a trust-receipt loan.

The dependent variables of the study have been defined as follows:

- i. Return on Asset: ROA is also another major ratio that indicates the profitability of a bank. It measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how efficiently the resources of the company are used to generate the income. It further indicates the efficiency of the management of a company in generating net income from all the resources of the institution. ROA is calculated as Net Income divided by Total Asset.
- ii. Return on Equity: 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 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 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 a 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 shareholders capital. ROE is calculated as Net income divided by total equity capital.
- iii. Net Interest Margin: Net Interest Margin is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets. It is similar to the gross margin of non-financial companies. It is usually expressed as a percentage of what the financial institution

earns on loans in a time period and other assets minus the interest paid on borrowed funds divided by the average amount of the assets on which it earned income in that time period (the average earning assets). Net interest margin is similar in concept to net interest spread, but the net interest spread is the nominal average difference between the borrowing and the lending rates, without compensating for the fact that the earning assets and the borrowed funds may be different instruments and differ in volume. The net interest margin can therefore be higher (or occasionally lower) than the net interest spread.

2.4. Research Gap

This chapter reviewed the various theoretical and empirical studies which enhance the fundamental understanding on several perspectives of different studies that were conducted previously so as to explain the relationship between market interest rate factors, their fluctuations and their impact on bank performance. Most of the studies conducted across various countries as well as in Nepal have focused simply on the lending and borrowing rates and the impact of such rates on the profitability of commercial banks. Among various studies related to market interest rates, Treasury bill rate and reverse repo have been most ignored. Some studies have shown that the short run money market interest rates have no impact on profitability. Some studies have shown positive relationship and other studies have shown negative or no relationship between market interest rate fluctuations and its impact on the profitability of commercial banks. The actions towards market interest rates are very critical so as to determine and improve bank's financial performance.

The topic of this study has been conducted by very few of the researchers in Nepal. However, the study including the Treasury bill rate and Reverse repo are hardly found in the context of Nepal. This study intends to fill a gap in research to most of the market interest rate factors and their impact on the profitability of commercial banks. Most of the above researches are related to impact of lending rate on bank performance and only few researches are related to the overall market interest rates and their impact. Various macroeconomic and bank specific factors affect the bank deposit positively and negatively. Previous literature did not consider most of the statistical techniques but these things need to be considered to make the research methodologically strong.

CHAPTER III- RESEARCH METHODOLOGY

Research methodology provides the overall plan that is associated with the study. In other words, it provides the basic framework on which the study is based. The chapter shows the detail of method used for data collection followed by the methods and tools that are used for the analysis of data. It is necessary to describe the research methodology before presenting the analysis and interpretation of data. It is because the absence of methodology in any study makes the conclusions drawn from the study more likely to be misunderstood. It is designed and developed as a guideline or a plan for the achievement of objectives set and developed for this study. This chapter thus explains the methodology employed in this study. It has been divided into five different sections. The first section of this chapter provides the description of research design used in the study. The second section deals with the population and sample as well as the sampling design used for the purpose of the study. Likewise, section three describes the nature and sources of data along with the instrument of data collection. Similarly, the fourth section shows the method of analysis for the study. Finally, the last section of the chapter shows the research framework and definition of variables.

3.1. Research Design

This study aims to explore the determinants of market interest rates and determine their impact on the profitability of commercial banks. The exploration is done through the development and testing of supporting research hypothesis derived from the literature review. The study is completely quantitative in nature. Descriptive and causal comparative research designs are used to deal with the various issues raised in this study. The descriptive research design has been adopted to undertake the fact-finding operation searching for adequate information related to efficiency in Nepalese commercial banks. The study has attempted to describe the situation and events that occurred during the period of study in the context of Nepalese commercial banks. Likewise, this study has also adopted causal comparative research design to determine the effect of calendar month of the year. This design has also been used to understand whether there is a significant relationship between bank's dependent profitability measures (ROA, ROE and NIM) and independent bank specific factors (loan rate, deposit rate, Treasury bill rate, reverse repo rate, capital adequacy, liquidity and non-performing loan) as

independent variables. The detailed methodological issues are discussed extensively in the respective sections of the study.

3.2. Population, sample and sampling design

The population or universe for research refers to the entire members of the research study in which the research work is based. Sampling is the process of selecting a group of representative from a population for the purpose of statistical analysis. The target population of this study comprises of all 27 commercial banks of Nepal. The sampling design used for the purpose of selection of sample in this study is stratified sampling. The target population (i.e. 27 Nepalese commercial banks in this study) is classified into 3 strata on the basis of nature and type of commercial banks namely government, joint venture and domestic private banks. Then after, 3 sample banks (RBBL, SCBL and NIC ASIA) are chosen in a random proportion.

3.2.1. Description of the sample

The population of this study includes the commercial banks of Nepal licensed by NRB. There are all together 27 'A' Class Commercial Banks in Nepal as of Mid July 2020 (www.nrb.com.np, 2020). The study consists of 3 commercial banks as sample out of 27 commercial banks in operation. The sampled data will be collected from FY 2015/16 to 2019/20 and it covers all types and nature of banks operated in Nepal like government, joint ventured, privately owned.

Government Banks: Government banks, that are fully owned by the government of Nepal have large scale of branch networks in both urban and rural centers around the country and have substantial shares in the total assets of the industry. Government of Nepal has a significant ownership in Rastriya Banijya Bank Limited, which is why RBBL is taken as a sample from this category of banks.

Joint Venture Banks: The joint venture banks have been operating on a nation-wide basis and started to establish since mid-1980s. These banks have foreign equity participation (along with domestic) and management with good name and international reputation. They operate under less administrative pressure from local governments, but most of the joint venture banks are highly concentrated in urban areas, particularly in Kathmandu

valley. Standard Chartered Bank Limited (SCBL) is taken as a sample from this category of banks.

Domestic private Banks: Domestic private banks came into operation by late 1990s and early 2000s. They are managed and owned by private sector. NIC Asia Bank Limited (NIC ASIA) is taken as the sample from this category of banks.

Sample on the basis of stratified sampling technique as mentioned earlier can be summarized on the following table 3.1.

Table 3.1
Number of commercial banks selected for the study

S.N.	Name of commercial banks	Sample Period	Observations
1	Rastriya Banijya Bank Limited	2015/16 to 2019/20	5
2	Standard Chartered Bank Limited	2015/16 to 2019/20	5
3	NIC ASIA Bank Limited	2015/16 to 2019/20	5

3.3. Nature and sources of data and instrument of data collection

3.3.1. Nature and sources of data collection

Data for the study will be collected using the secondary method of data collection. The secondary source of data has been employed to understand market interest rates and profitability of Nepalese commercial banks. For the secondary source of data, the relevant data will be gathered from the annual reports of the sample commercial banks so as to track the information related to profitability using proxies such as ROA, ROE and NIM. The variables will be calculated using their respective formulas with the help of the annual reports of respective banks for the five years period from 2015/16 to 2019/20 and NRB websites. The other data for this study will also be obtained from the Bank Supervision Report, Banking and Financial Statistics published by Nepal Rastra Bank. The annual reports of the sample banks are gathered from their respective websites. In addition, other relevant data will be collected from journals, published reports, government publications and applicable sites on the internet.

3.3.2. Model Specification

Three different measures of profitability of Nepalese commercial banks measured in terms of Return on Asset (ROA), Return on Equity (ROE), Net Interest Margin (NIM) will be used in this study to investigate fluctuations on market interest rates and their impact on profitability of commercial banks. In other words, an attempt has been made to find the relationship between profitability and different market interest rates. Therefore, every panel of data model will contain different proxy of profitability of Nepalese commercial banks. Multiple regression model will be used to test the statistical significance of the data as follows:

Model 1:

In this model, the dependent variable is Return on Assets (ROA) which indicates how efficiently a company is performing by comparing the profit it is generating to the capital it has invested in assets. The effect of Loan rate, Deposit rate, Treasury bill rate, Reverse repo rate, Capital Adequacy ratio, Liquidity ratio and Non-Performing loan on Return on Assets will be shown in this model. The model is presented as follows:

$$ROA_t = \beta_0 + \beta_1 LR_t + \beta_2 DR_t + \beta_3 TBR_t + \beta_4 RRP_t + \beta_5 CA_t + \beta_6 LQ_t + \beta_7 NPL_t + \varepsilon_t$$

Model 2:

In this model, the dependent variable is Return on Equity (ROE) which indicates how well the equity holders are experiencing income and growth from their investment. The effect of Loan rate, Deposit rate, Treasury bill rate, Reverse repo rate, Capital Adequacy ratio, Liquidity ratio and Non-Performing loan on Return on Equity will be shown in this model. The model is presented as follows:

$$ROE_t = \beta_0 + \beta_1 LR_t + \beta_2 DR_t + \beta_3 TBR_t + \beta_4 RRP_t + \beta_5 CA_t + \beta_6 LQ_t + \beta_7 NPL_t + \varepsilon_t$$

Model 3:

In this model, the dependent variable is NIM which explains how much net interest income is earned from total earning assets. The effect of Loan rate, Deposit rate, Treasury bill rate, Reverse repo rate, Capital Adequacy ratio, Liquidity ratio and Non-Performing loan on Net Interest Margin will be shown in this model. The model is presented as follows:

$$NIM_t = \beta_0 + \beta_1 LR_t + \beta_2 DR_t + \beta_3 TBR_t + \beta_4 RRP_t + \beta_5 CA_t + \beta_6 LQ_t + \beta_7 NPL_t + \varepsilon_t$$

Where,

Dependent variables are:

1. ROA_t =Return on Assets for the firm during the period t
2. ROE_t =Return on Equity for the firm during the period t
3. NIM_t =Net Interest Margin for the firm during the period t

Independent variables are:

1. LR_t = Loan Rate for the firm during the period t
2. DR_t = Deposit Rate for the firm during the period t
3. TBR_t = Treasury Bill Rate for the firm during the period t
4. RRP_t = Reverse Repo Rate for the firm during the period t
5. CA_t = Capital Adequacy for the firm during the period t
6. LQ_t = Liquidity position for the firm during the period t
7. NPL_t = Non-Performing Loan of bank at time t
8. ε_t = Error term

3.3.3. Instrument of data collection

This study is based completely on the secondary data published by the respective banks and the NRB. Descriptive statistics that involves mean, standard deviation, minimum and maximum are used for the analysis of secondary data. Similarly, correlation analysis is used to find out the relation between the dependent, independent and the control variables. Likewise, in order to find out the reliability and validity of the data, t-test and f-test is used. T-test is used in order to find the significance of individual model. In the same way, f-test is done in order to find out the overall significance of the model. In the same way, normality tests are used to determine if data set is well-modeled by a normal distribution and to compute how likely it is for random variables underlying the data set to be normally distributed. Apart from these; Ms Word, Ms excel and SPSS (Statistical Package for Social Sciences) are used as a tool for this research. Due to the various constraints (like time constraint and unavailability of data), it is difficult to include whole population in the study. For the representation of more reliable and adequate population in the sample, this study used stratified sampling technique which categorized the bank in three strata based on the characteristics of the banks namely government bank, joint

venture bank and domestic private bank. After dividing the population into three strata out of 27 commercial banks 1 government bank, 1 joint venture bank and 1 private bank have been included in the sample for the purpose of study.

3.4. Methods of analysis

For the secondary data to be used in the research, descriptive statistics (mean, standard deviation, maximum and minimum) and correlation and regression analysis will be used to find out the relation between the variables under study. For the representation of the target population, this study will use stratified sampling technique categorizing Nepalese commercial banks in three strata namely government bank, joint venture bank and private bank. After dividing the population into three strata out of 27 commercial banks; 1 government bank, 1 joint venture bank and 1 domestic private bank have been included in the sample.

CHAPTER IV- RESULTS AND DISCUSSION

4.1. Presentation of results

This chapter deals with the results of study which include descriptive statistics of variable correlation results for dependent and explanatory variables, diagnosis test for the regression models, and regression analysis for three profitability measures of the study; return on asset, return on equity, and net interest margin and finally the discussion of results. Secondary data analysis was done by using SPSS (Statistical Package for Social Sciences) software. Mean and standard deviation value were used to rank the major determinants of profitability of commercial banks in Nepal. This chapter presents analysis and findings of market interest rate fluctuations and its impact on the profitability of commercial banks in Nepal as set out in the research methodology. The results for all these equations are divided into three types: Descriptive results, correlation results and those obtained from the regression analysis.

4.2. Analysis of secondary data

This section is related to the analysis of secondary data and presents the impact of market interest rates and control variables on the profitability of Nepalese commercial banks. The data used for the study was gathered exclusively from the annual reports and bank supervision reports obtained from their respective websites and other relevant websites. After compiling this data, a descriptive statistics, correlation and linear regression analysis was carried out on return on assets (ROA), return on equity (ROE) and net interest margin (NIM) ratios.

4.2.1. Structure and pattern of bank profitability of Nepalese Commercial Banks

Structure and pattern of the profitability of commercial banks is measured by all the variables used in the model. Profitability of the commercial banks as a dependent variable measured by ROA, ROE and NIM is used to establish the relationship with loan Rate, deposit Rate, Treasury bill rate, Reverse repo rate and control variables like capital adequacy, liquidity management and non- performing loan.

The structure and pattern of ROA of Nepalese commercial banks is presented in table 4.1.

Table 4.1

Structure and Pattern of ROA of Nepalese Commercial Banks (in percent)

This table shows the structure and pattern of return on assets. The data are for the period of five years of 3 Nepalese commercial banks. Last two columns shows the mean value and standard deviation value of return on assets for different commercial banks and the last two rows shows the year wise mean value and standard deviation (SD) value.

S.N.	Name of Commercial Banks	2015/16	2016/17	2017/18	2018/19	2019/20	Mean	S.D.
1.	Standard Chartered Bank Nepal Limited	1.98	1.84	2.61	2.61	1.71	2.15	0.43
2.	Rastriya Banijya Bank Limited	1.42	1.94	1.85	2.23	1.64	1.82	0.31
3.	NIC ASIA Bank Limited	1.51	1.64	0.97	1.56	1.32	1.4	0.27
	Mean	1.64	1.81	1.81	2.13	1.56		
	S.D.	0.30	0.15	0.82	0.53	0.21		

Source: Annual Report of selected commercial banks

Table 4.1 reveals that the mean value measures the average ROA of selected sample banks for particular year and standard deviation measures the variability in ROA. Among commercial banks, Standard Chartered Bank Nepal Limited is able to provide the highest average ROA from 2015/16 to 2019/20 with the mean and standard deviation of 2.15 percent and 0.43 percent respectively. The higher standard deviation of 0.43 percent of Standard Chartered Bank Nepal depicts higher volatility of its ROA as compared to other commercial banks. Likewise, NIC ASIA Bank has the lowest average ROA and SD with 1.4 percent and 0.27 percent respectively. The sample banks have highest mean of ROA in the year 2018/19 with 2.13 percent and highest standard deviation of 3.64 percent in

the year 2017/18. Likewise, they have lowest mean of ROA in the year 2019/20 with 1.56 percent and lowest Standard Deviation of 0.15 percent in 2016/17. The graphical representation of different average ROA data for the five years periods from 2015/16 to 2019/20 is shown in figure 4.1.

Figure 4.1

Trend of average ROA of Nepalese commercial banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and ROA is presented in Y-axis in percent. This figure has been drawn on the basis of the mean value of return on assets.

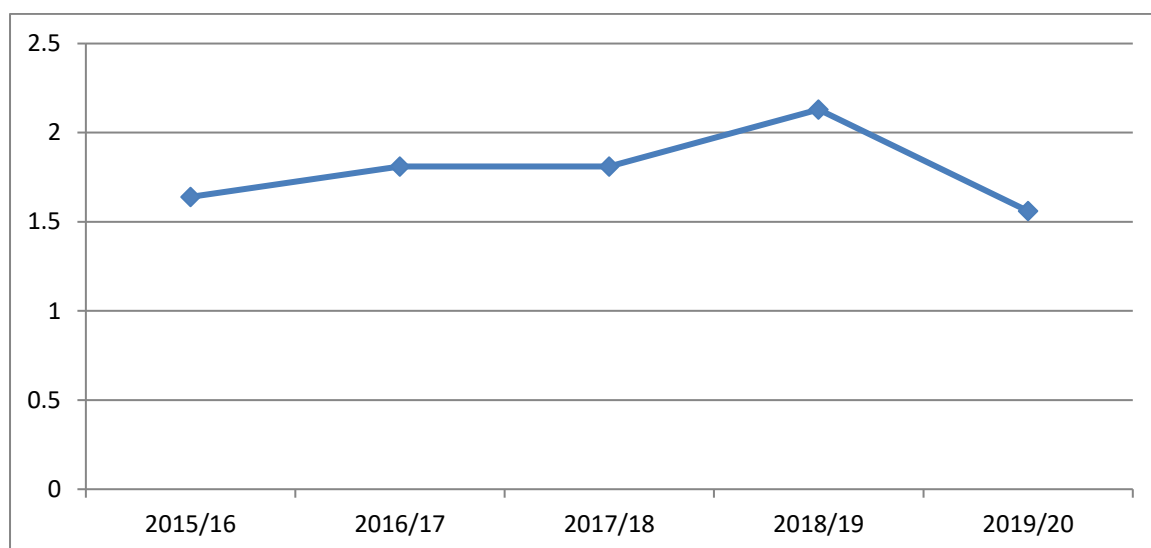


Figure 4.1 shows the comparative analysis of pattern of ROA of Nepalese commercial banks. The graph shows trend and patterns of average ROA of Nepalese commercial banks which is slightly increasing from 2015/16 to 2016/17, remained constant in 2017/18, increasing in 2018/19 and facing a decreasing trend in 2019/20. ROA is a strong measurement of bank performance.

Likewise, the structure and pattern of ROE of the commercial banks respectively from period of 2015/16 through 2019/20 is presented in table 4.2.

Table 4.2

Structure and pattern of ROE of Nepalese Commercial Banks(in percent)

This table shows the pattern of return on equity. The data are for the period of five years (from 2015/16 to 2019/20) of 3 Nepalese commercial banks. Last two columns shows the mean value and standard deviation value of return on equity for different commercial bank and the last two rows shows the year wise mean value and standard deviation value for return on equity.

S.N.	Name of Commercial Banks	2015/16	2016/17	2017/18	2018/19	2019/20	Mean	S.D.
1.	Standard Chartered Bank Nepal Limited	17.18	11.98	18.66	19.49	15.15	16.49	3.01
2.	Rastriya Banijya Bank Limited	27.41	26.53	19.19	23.39	19.01	23.11	3.95
3.	NIC ASIA Bank Limited	16.5	16.84	12.09	22.73	19.26	17.48	3.91
	Mean	20.36	18.45	16.65	21.87	17.81		
	S.D.	6.11	7.41	3.96	2.09	2.30		

Source: Annual Report of selected commercial banks

Table 4.2 reveals that the mean value measures the average ROE of selected sample banks for particular year and standard deviation measures the variability in ROE. Among commercial banks, Rastriya Banijya Bank Ltd is able to provide the highest average ROE and standard deviation of 23.11 percent and 3.95 percent respectively. The higher standard deviation of Rastriya Banijya Bank depicts higher volatility of its ROE as compared to other commercial banks. Likewise, Standard Chartered Bank Nepal Limited

has the lowest average ROE and SD of 16.49 percent 3.01 percent respectively. The sample banks have the highest mean of ROE in the year 2018/19 with 21.87 percent and highest SD in the year 2016/17 with 7.41 percent. Likewise, the sample banks have the lowest mean of ROE in the year 2017/18 with 16.65 percent and lowest SD of ROE in the year 2018/19 with 2.09 percent.

Figure 4.2 shows the graphical representation of different average ROE data for five year period. Figure shows the trend and patterns of average ROE of Nepalese commercial banks from 2015/16 to 2019/20.

Figure 4.2

Trend of average ROE of Nepalese commercial banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and ROE is presented in Y-axis in percent. This figure has been drawn on the basis of the mean value of return on equity.

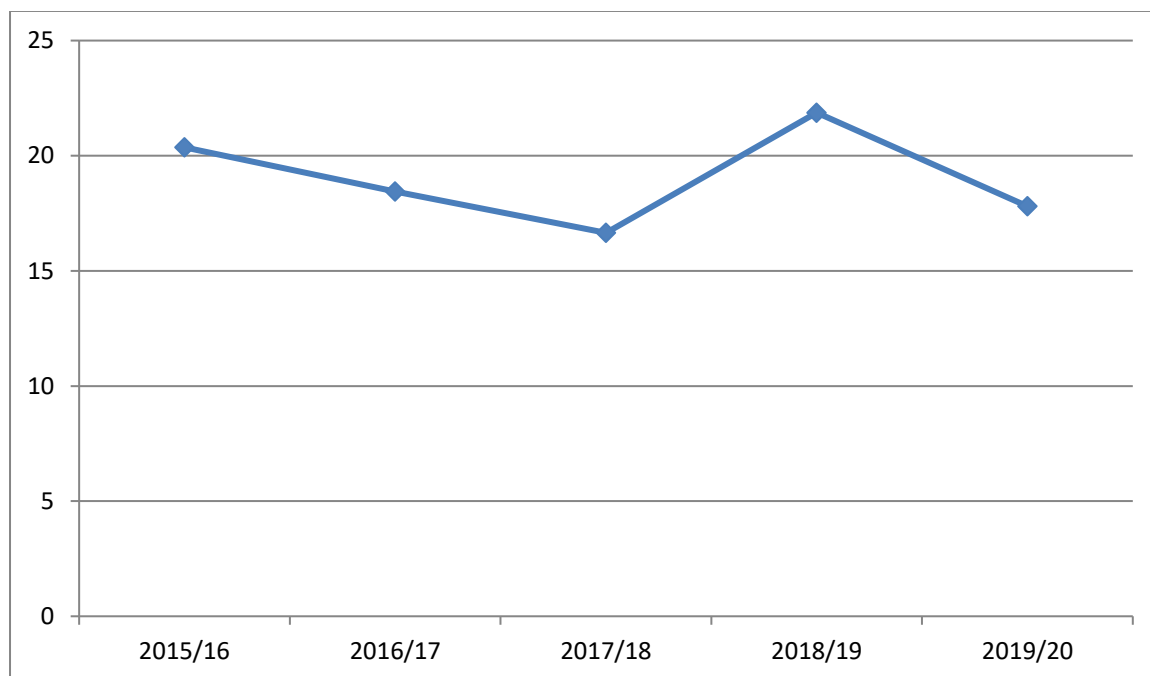


Figure 4.2 shows the comparative analysis of pattern of ROE of Nepalese commercial banks. The graph shows the trend and patterns of average ROE of Nepalese commercial banks which is decreasing from 2015/16 to 2017/18, increasing in 2018/19 and facing a decreasing trend in 2019/20.

In the same way, the structure and pattern of NIM of the commercial banks respectively from period of 2015/16 through 2019/20 is presented in table 4.3.

Table 4.3

Structure and Pattern of NIM of Nepalese Commercial Banks (in percent)

This table shows the pattern of Net Interest Margin. NIM in the table has been calculated by dividing the net interest income by average earning assets. The data are for the period of five years (from 2015/16 to 2019/20) of 3 Nepalese commercial banks. Last two columns shows the mean value and standard deviation value of NIM for different commercial bank and the last two rows shows the year wise mean value and standard deviation value for Net Interest Margin.

S.N.	Name of Commercial Banks	2015/16	2016/17	2017/18	2018/19	2019/20	Mean	S.D.
1.	Standard Chartered Bank Nepal Limited	2.84	3.08	4.06	3.99	3.30	3.45	0.55
2.	Rastriya Banijya Bank Limited	3.63	4.11	4.84	4.69	3.83	4.22	0.53
3.	NIC ASIA Bank Limited	2.78	2.83	3.07	3.58	3.23	3.10	0.33
	Mean	3.08	3.34	3.99	4.09	3.45		
	S.D.	0.47	0.68	0.89	0.56	0.33		

Source: Annual report of selected commercial banks

Table 4.3 reveals that the mean value measures the average NIM of selected sample banks for particular year and standard deviation measures the variability in NIM. Among commercial banks, Rastriya Banijya Bank Ltd has the highest average NIM of 4.22 percent. Likewise, Standard Chartered Bank Nepal Limited has the highest SD of 0.55

percent. The higher standard deviation of Standard Chartered Bank Nepal Limited depicts higher volatility of its NIM as compared to other commercial banks. In the same way, NIC ASIA Bank Limited has the lowest average NIM of 3.10 percent and lowest SD of 0.33 percent. The sample banks have highest mean of NIM in the year 2018/19 with 4.09 percent and the lowest mean of NIM in the year 2015/16 with 3.08 percent. Similarly, the sample banks have highest SD of NIM in the year 2017/18 with 0.89 percent and lowest SD of NIM in the year 2019/20 with 0.33 percent.

Figure 4.3 shows the graphical representation of different average NIM data for five year period. Figure shows the trend and patterns of average NIM of Nepalese commercial banks from 2015/16 to 2019/20.

Figure 4.3

Trend of average NIM of Nepalese commercial banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and NIM is presented in Y-axis in percent. This figure has been drawn on the basis of the mean value of net interest margin.

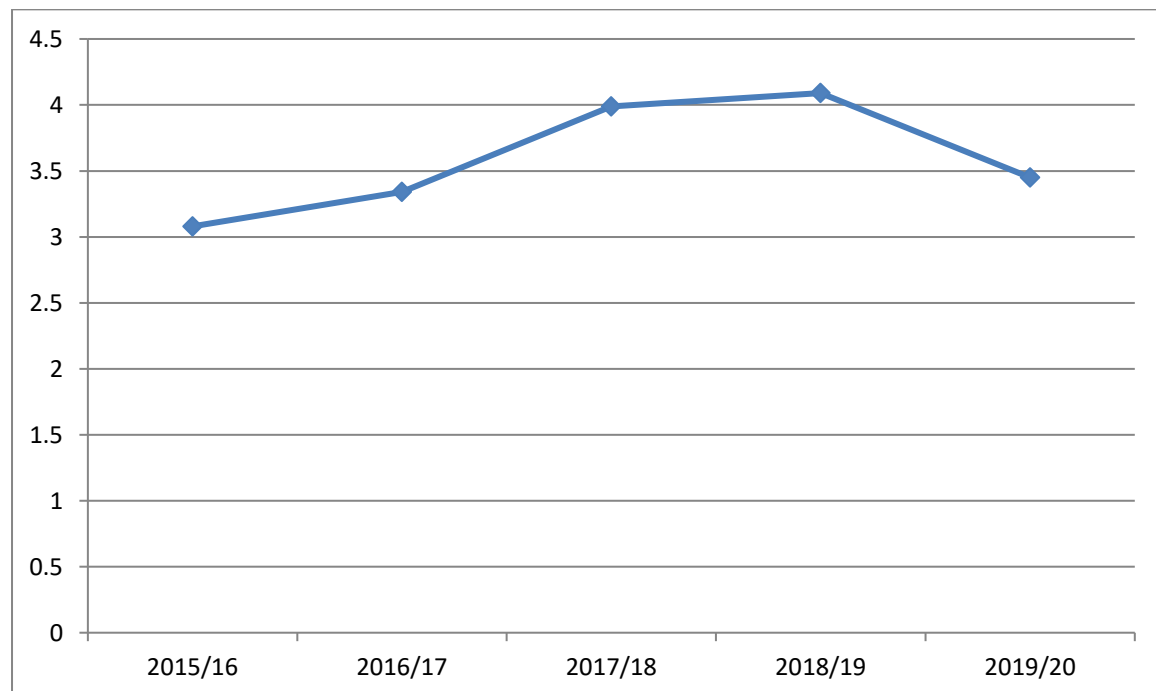


Figure 4.3 shows the comparative analysis of pattern of NIM of Nepalese commercial banks. The graph shows the trend and patterns of average NIM of Nepalese commercial banks which has been constantly increasing from 2015/16 to 2018/19 and facing a decreasing trend in 2019/20.

4.2.2. Structure and Pattern of market interest rates and control variables

In this section, the structure of various independent variables namely Loan rate (LR), Deposit rate (DR), Treasury Bill rate (TBR), Reverse repo rate (RP), Bank rate (BR), Capital adequacy ratio (CA), Liquidity (LQ) and Non-performing loan (NPL) of Nepalese commercial banks from the year 2015/16 to 2019/20 are analyzed. The structure and pattern of Loan rate is presented in table 4.4.

Table 4.4

Structure and Pattern of Loan Rate of Nepalese Commercial Banks (in percent)

This table shows the pattern of Loan Rate. The loan rates presented are the average data of four quarters of the respective years. The data are for the period of five years (from 2015/16 to 2019/20) of 3 Nepalese commercial banks. Last two columns shows the mean value and standard deviation value of LR for different commercial bank and the last two rows shows the year wise mean value and standard deviation value for Loan Rate.

S.N.	Name of Commercial Banks	2015/16	2016/17	2017/18	2018/19	2019/20	Mean	S.D
1.	Standard Chartered Bank Nepal Limited	5.90	8.07	9.47	9.50	8.47	8.28	1.47
2.	Rastriya Banijya Bank Limited	8.32	7.78	9.20	8.97	9.63	8.78	0.73
3.	NIC ASIA Bank Limited	7.77	9.10	10.12	11.74	10.39	9.82	1.49
	Mean	7.33	8.32	9.60	10.07	9.50		
	S.D.	1.27	0.69	0.47	1.47	0.97		

Source: Annual reports of selected commercial banks

Table 4.4 indicates the structure and pattern of Loan Rate of the commercial banks respectively from the period of 2015/16 to 2019/20. The mean value measures the average LR of selected sample banks for particular year and standard deviation measures the variability in LR. Among the sample commercial banks, NIC ASIA Bank has the highest average LR and SD from 2015/16 to 2019/20 with the mean of 9.82 percent and SD of 1.49 percent. The higher SD of NIC ASIA Bank Limited depicts higher volatility of its LR as compared to other commercial banks. Likewise, Standard Chartered Bank has the lowest average LR with 8.28 percent. Rastriya Banijya Bank Limited has the lowest SD of 0.73 percent. The sample banks have highest mean of LR in the year 2018/19 with 10.07 percent and lowest mean of LR in the year 2015/16 with 7.33 percent. Similarly, the sample banks have highest SD of LR in the year 2018/19 with 1.47 percent and lowest SD of LR in the year 2017/18 with 0.47 percent.

Figure 4.4 shows the graphical representation of different average LR data for five year period which shows the trend and pattern of LR of commercial banks.

Figure 4.4

Trend of average LR of Nepalese commercial banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and LR is presented in the Y-axis. This figure has been drawn on the basis of the mean value of loan rate.

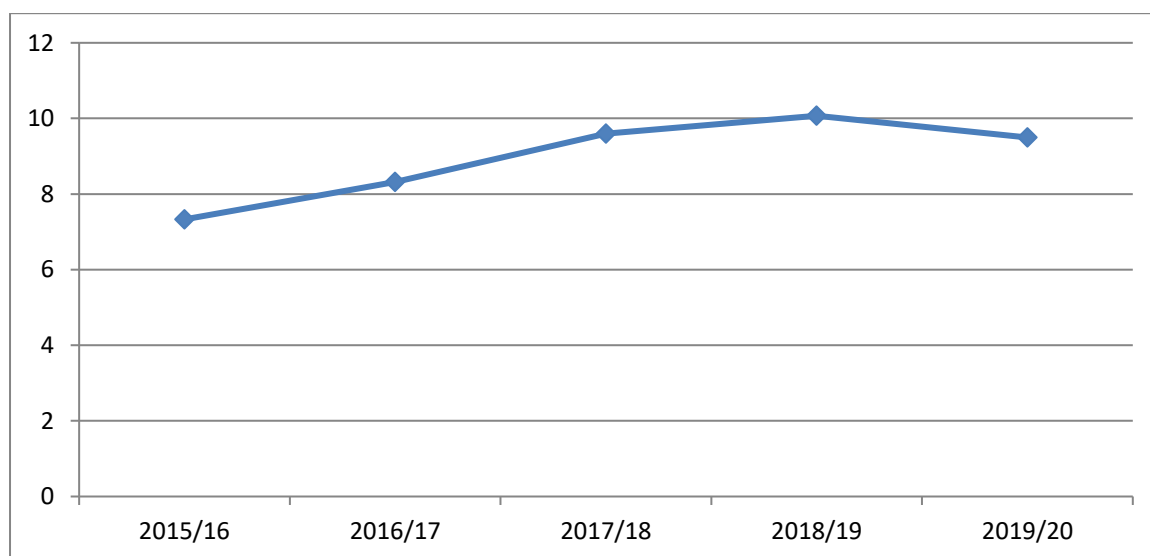


Figure 4.4 shows the comparative analysis of pattern of LR of Nepalese commercial banks. The graph shows the trend and pattern of average LR of Nepalese commercial

banks which has been constantly increasing from 2015/16 to 2018/19 and facing a decreasing trend in 2019/20.

The structure and pattern of DR of the commercial banks respectively from period of 2015/16 through 2019/20 is presented in table 4.5.

Table 4.5

Structure and Pattern of Deposit Rate of Nepalese Commercial Banks (*in percent*)

This table shows the pattern of Deposit Rate. The deposit rates presented are the average data of all the rates published by the bank of the respective years. The data are for the period of five years (from 2015/16 to 2019/20) of 3 Nepalese commercial banks. Last two columns shows the mean value and standard deviation value of DR for different commercial bank and the last two rows shows the year wise mean value and standard deviation value for Deposit Rate.

S.N.	Name of Commercial Banks	2015/16	2016/17	2017/18	2018/19	2019/20	Mean	S.D
1.	Standard Chartered Bank Nepal Limited	1.26	3.06	4.41	5.05	4.84	3.72	1.58
2.	Rastriya Banijya Bank Limited	1.27	1.24	1.76	2.59	3.30	2.03	0.89
3.	NIC ASIA Bank Limited	4.41	5.61	6.53	6.71	6.21	5.89	0.93
	Mean	2.31	3.30	4.23	4.78	4.78		
	S.D.	1.82	2.20	2.39	2.07	1.46		

Source: Annual reports of selected commercial banks

Table 4.5 indicates the structure and pattern of Deposit Rate of the commercial banks respectively from the period of 2015/16 to 2019/20. The mean value measures the

average DR of selected sample banks for particular year and standard deviation measures the variability in DR. Among the sample commercial banks, NIC ASIA Bank has the highest average DR of 5.89 percent. Likewise, Standard Chartered Bank has the highest SD from 2015/16 to 2019/20 with 1.58 percent. The higher SD of Standard Chartered Bank Limited depicts higher volatility of its DR as compared to other commercial banks. Likewise, Rastriya Banijya Bank has the lowest average DR and SD with 2.03 and 0.89 percent respectively. The sample banks have highest mean of DR in the year 2018/19 and 2019/20 with 4.78 percent and lowest mean of DR in the year 2015/16 with 2.31 percent. Similarly, the sample banks have highest SD of DR in the year 2017/18 with 2.39 percent and lowest SD of DR in the year 2019/20 with 1.46 percent.

Figure 4.5 shows the graphical representation of different average DR data for five year period which shows the trend and pattern of DR of commercial banks.

Figure 4.5

Trend of average DR of Nepalese commercial banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and DR is presented in the Y-axis. This figure has been drawn on the basis of the mean value of deposit rate.

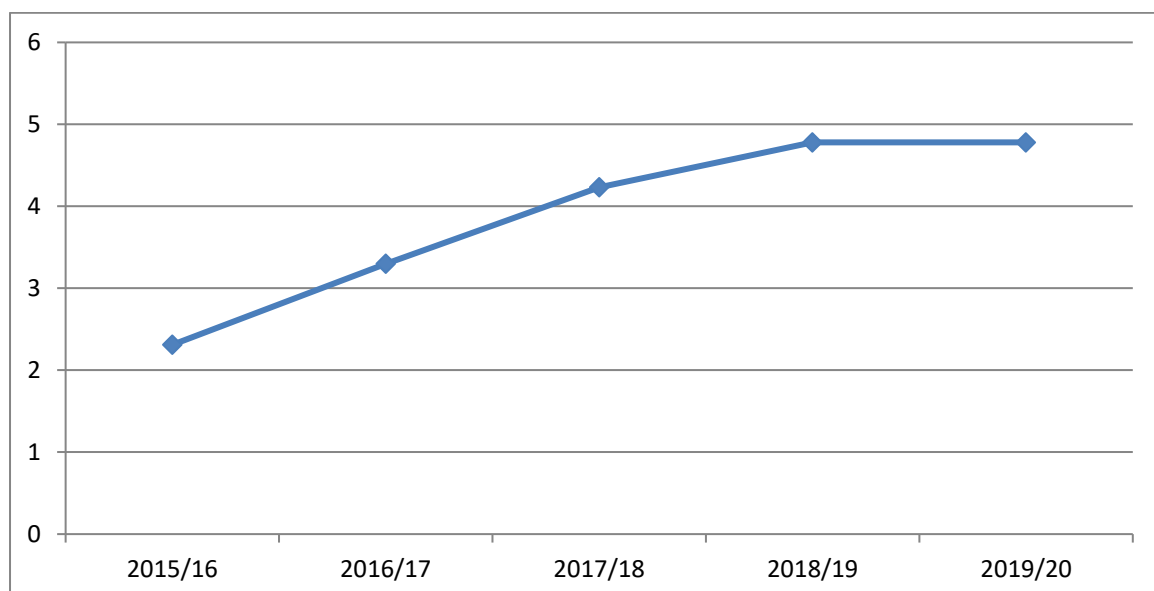


Figure 4.4 shows the comparative analysis of pattern of DR of Nepalese commercial banks. The graph shows the trend and pattern of average DR of Nepalese commercial banks which has been constantly increasing from 2015/16 to 2018/19 and remained constant in 2019/20.

The average trend of Treasury Bill Rate, Reverse Repo Rate and Bank Rate which are issued by Nepal Rastra Bank to Nepalese Commercial Banks from the period of 2015/16 to 2019/20 are presented in table 4.6.

Table 4.6

Structure and Pattern of Treasury bill, Reverse Repo and Bank rate (in percent)

This table shows the pattern of Treasury bill rate, Reverse Repo Rate and Bank rate (i.e. TBR, RP and BR) respectively from period of 2015/16 to 2019/20.

Year	2015/16	2016/17	2017/18	2018/19	2019/20
TBR	0.79	1.45	4.48	4.97	1.27
RRP	0.21	1.58	0.4	0.7	1.9

Source: NRB, Monetary Policy, Mid July 2020

Table 4.6 shows that TBR is continuously increasing from 0.79 percent in 2015/16 to 4.97 percent in 2018/19 and decreasing at a high proportion in 2019/20. It also indicates that there is a high fluctuation in Reverse Repo Rate from 2015/16 through 2019/20.

Figure 4.6 shows the pattern of Treasury Bill Rate from 2015/16 to 2019/20.

Figure 4.6

Trend of TBR of Nepalese commercial banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and TBR is presented in the Y-axis. This figure has been drawn on the basis of the mean value of Treasurybill rate.

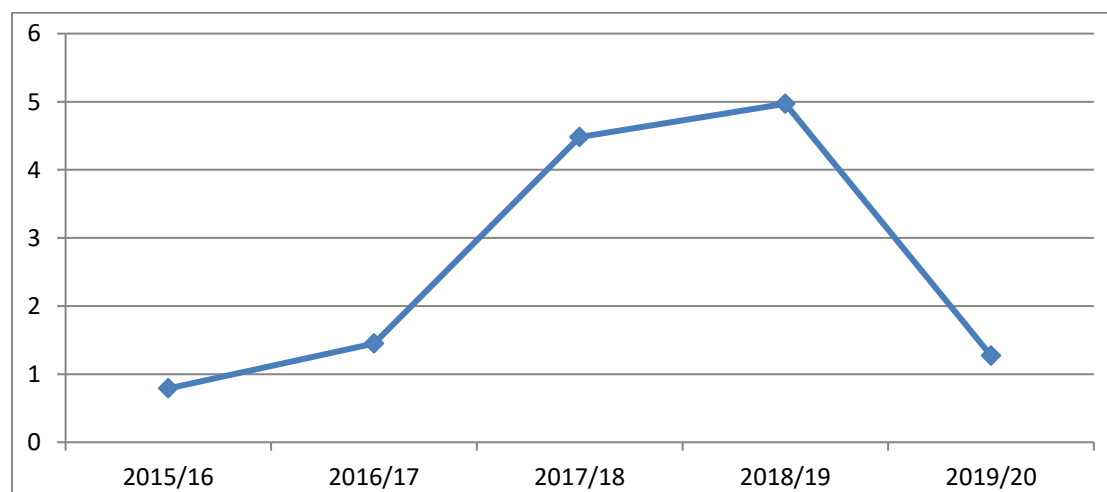


Figure 4.6 shows the trend of TBR for the five year period from 2015/16 to 2019/20. The graph shows percent change of TBR in Y-axis and the period from 2015/16 to 2019/20 in the X-axis. The above figure shows that there is an increasing trend of TBR from 2015/16 to 2018/19 and a decreasing trend in 2019/20.

Figure 4.7 shows the pattern of RRP from 2015/16 to 2019/20.

Figure 4.7

Trend of RRP of Nepalese Commercial Banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and RP is presented in the Y-axis. This figure has been drawn on the basis of the mean value of Reverse repo rate.

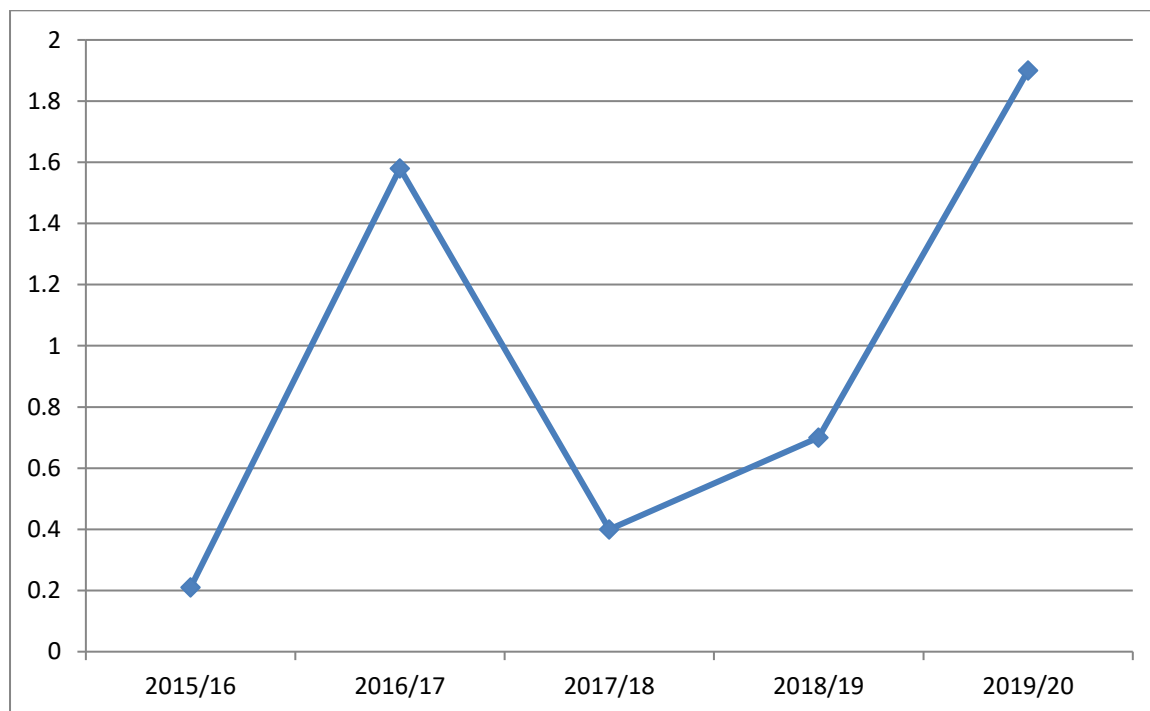


Figure 4.7 shows the trend of RRP for the five year period from 2015/16 to 2019/20. The graph shows percent change of RRP in Y-axis and the period from 2015/16 to 2019/20 in the X-axis. The above figure shows that RRP is increasing from 2015/16 to 2016/17, decreasing from 2016/17 to 2017/18 and followed an increasing trend from 2017/18 onwards.

The structure and pattern of CA of the commercial banks respectively from period of 2015/16 through 2019/20 is presented in table 4.7.

Table 4.7
Structure and Pattern of Capital Adequacy of Nepalese commercial banks
(in percent)

This table shows the pattern of Capital Adequacy. The data are for the period of five years (from 2015/16 to 2019/20) of 3 commercial banks of Nepal. Last two columns show the mean value and standard deviation value of Capital Adequacy for different commercial banks and the last two rows shows the year wise mean value and standard deviation value for Capital Adequacy.

S.N.	Name of Commercial Banks	2015/16	2016/17	2017/18	2018/19	2019/20	Mean	S.D
1.	Standard Chartered Bank Nepal Limited	16.38	21.08	22.99	19.69	18.51	19.73	2.51
2.	Rastriya Banijya Bank Limited	10.46	10.39	11.46	13.39	12.64	11.67	1.33
3.	NIC ASIA Bank Limited	12.66	13.83	12.37	13.28	13.50	13.13	0.60
	Mean	13.17	15.10	15.61	15.45	14.88		
	S.D.	2.99	5.46	6.41	3.67	3.17		

Source: Banking Supervision Report, 2020 and Annual Report of selected commercial banks

Table 4.7 indicates the structure and pattern of Capital Adequacy of the commercial banks respectively from the period of 2015/16 to 2019/20. The mean value measures the average CA of selected sample banks for particular year and standard deviation measures

the variability in CA. Among the sample commercial banks, Standard Chartered Bank has the highest average CA and SD from 2015/16 to 2019/20 with 19.73 and 2.51 percent respectively. The higher SD of Standard Chartered Bank Limited depicts higher volatility of its CA as compared to other commercial banks. Rastriya Banijya Bank has the lowest average CA with 11.67 percent. Likewise, NIC ASIA Bank has the lowest SD of 0.60 percent. The sample banks have highest mean of CA in the year 2017/18 with 15.61 percent and lowest mean of CA in the year 2015/16 with 13.17 percent. Similarly, the sample banks have highest SD of CA in the year 2017/18 with 6.41 percent and lowest SD of CA in the year 2015/16 with 2.99 percent.

Figure 4.8 shows the graphical representation of different average CA data for five year period which shows the trend and pattern of CA of commercial banks.

Figure 4.8

Trend of CA of Nepalese Commercial Banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and CA is presented in the Y-axis. This figure has been drawn on the basis of the mean value of Capital Adequacy.

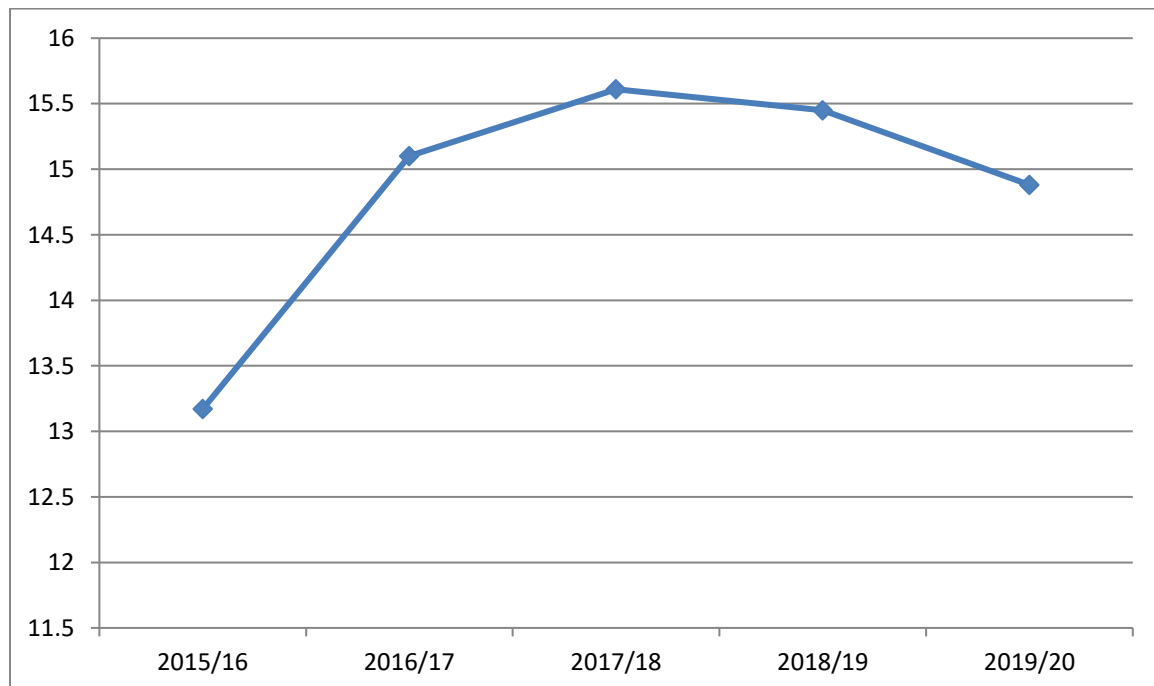


Figure 4.8 shows the comparative analysis of pattern of CA of Nepalese commercial banks. The graph shows the trend and pattern of average CA of Nepalese commercial

banks which has been constantly increasing from 2015/16 to 2017/18 and decreasing from 2017/18 onwards.

The structure and pattern of liquidity of the commercial banks respectively from period of 2015/16 through 2019/20 is presented in table 4.8.

Table 4.8

Structure and Pattern of Liquidity of Nepalese Commercial Banks (*in percent*)

This table shows the pattern of Liquidity ratio. The data are for the period of five years (from 2015/16 to 2019/20) of 3 commercial banks of Nepal. Last two columns show the mean value and standard deviation value of Liquidity ratio for different commercial banks and the last two rows shows the year wise mean value and standard deviation value for Liquidity ratio.

S.N.	Name of Commercial Banks	2015/16	2016/17	2017/18	2018/19	2019/20	Mean	S.D
1.	Standard Chartered Bank Nepal Limited	47.17	56.98	43.01	47.55	57.44	50.43	6.44
2.	Rastriya Banijya Bank Limited	45.70	37.85	35.57	30.59	41.41	38.22	5.73
3.	NIC ASIA Bank Limited	23.79	25.80	24.45	26.05	27.09	25.44	1.32
	Mean	38.89	40.21	34.34	34.73	41.98		
	S.D.	13.09	15.72	9.34	11.33	15.18		

Source: Banking Supervision Report, 2020 and Annual Report of selected commercial banks

Table 4.8 indicates the structure and pattern of Liquidity (LQ) of the commercial banks respectively from the period of 2015/16 to 2019/20. The mean value measures the average LQ of selected sample banks for particular year and standard deviation measures the variability in LQ. Among the sample commercial banks, Standard Chartered Bank has the highest average LQ and SD from 2015/16 to 2019/20 with 50.43 and 6.44 percent respectively. The higher SD of Standard Chartered Bank Limited depicts higher volatility of its LQ as compared to other commercial banks. NIC ASIA Bank has the lowest average LQ and SD of 25.44 and 1.32 percent respectively. The sample banks have highest mean of LQ in the year 2019/20 with 41.98 percent and lowest mean of LQ in the year 2017/18 with 34.34 percent. Similarly, the sample banks have highest SD of LQ in the year 2016/17 with 15.72 percent and lowest SD of LQ in the year 2017/18 with 9.34 percent.

Figure 4.9 shows the graphical representation of different average LQ data for five year period which shows the trend and pattern of LQ of commercial banks.

Figure 4.9

Trend of LQ of Nepalese Commercial Banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and LQ is presented in the Y-axis. This figure has been drawn on the basis of the mean value of Liquidity.

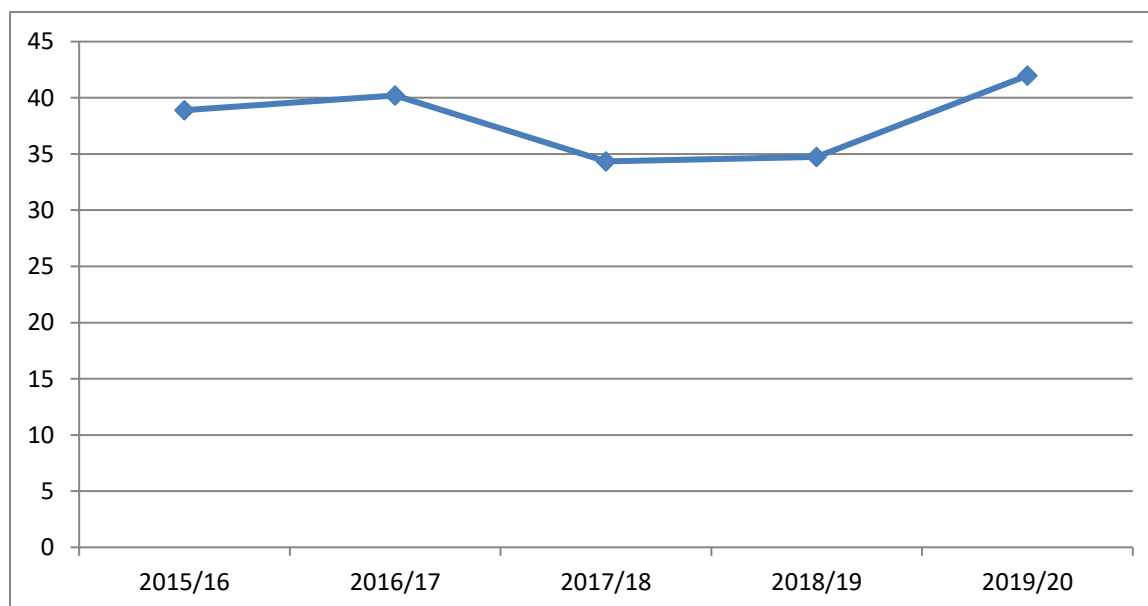


Figure 4.9 shows the comparative analysis of pattern of LQ of Nepalese commercial banks. The graph shows the trend and pattern of average LQ of Nepalese commercial

banks which has been increasing from 2015/16 to 2016/17, decreasing from 2016/17 to 2017/18 and increasing from 2017/18 onwards.

The structure and pattern of Non-Performing Loan (NPL) of the commercial banks respectively from period of 2015/16 through 2019/20 is presented in table 4.9.

Table 4.9
Structure and Pattern of Non-Performing Loan of Nepalese Commercial Banks
(in percent)

This table shows the pattern of Non-Performing Loan. The data are for the period of five years (from 2015/16 to 2019/20) of 3 commercial banks of Nepal. Last two columns show the mean value and standard deviation value of Non-Performing Loan for different commercial banks and the last two rows shows the year wise mean value and standard deviation value for Non-Performing Loan.

S.N.	Name of Commercial Banks	2015/16	2016/17	2017/18	2018/19	2019/20	Mean	S.D
1.	Standard Chartered Bank Nepal Limited	0.32	0.19	0.18	0.15	0.44	0.26	0.12
2.	Rastriya Banijya Bank Limited	4.25	3.77	4.75	4.59	4.08	4.29	0.39
3.	NIC ASIA Bank Limited	0.82	0.36	0.22	0.46	0.75	0.52	0.26
	Mean	1.80	1.44	1.72	1.73	1.76		
	S.D.	2.14	2.01	2.63	2.48	2.02		

Source: Banking Supervision Report, 2020 and Annual Report of selected commercial banks

Table 4.9 indicates the structure and pattern of NPL of the commercial banks respectively from the period of 2015/16 to 2019/20. The mean value measures the average NPL of selected sample banks for particular year and standard deviation measures the variability in NPL. Among the sample commercial banks, Rastriya Banijya Bank has the highest average NPL and SD from 2015/16 to 2019/20 with 4.29 and 0.39 percent respectively. The higher SD of Rastriya Banijya Bank Limited depicts higher volatility of its NPL as compared to other commercial banks. Standard Chartered Bank has the lowest average NPL and SD of 0.26 and 0.12 percent respectively. The sample banks have highest mean of NPL in the year 2015/16 with 1.80 percent and lowest mean of NPL in the year 2016/17 with 1.44 percent. Similarly, the sample banks have highest SD of LQ in the year 2017/18 with 2.63 percent and lowest SD of NPL in the year 2016/17 with 2.01 percent.

Figure 4.10 shows the graphical representation of different average NPL data for five year period which shows the trend and pattern of NPL of commercial banks.

Figure 4.10

Trend of NPL of Nepalese Commercial Banks

In this figure, period from 2015/16 to 2019/20 is presented in X-axis and NPL is presented in the Y-axis. This figure has been drawn on the basis of the mean value of Non-Performing Loan.

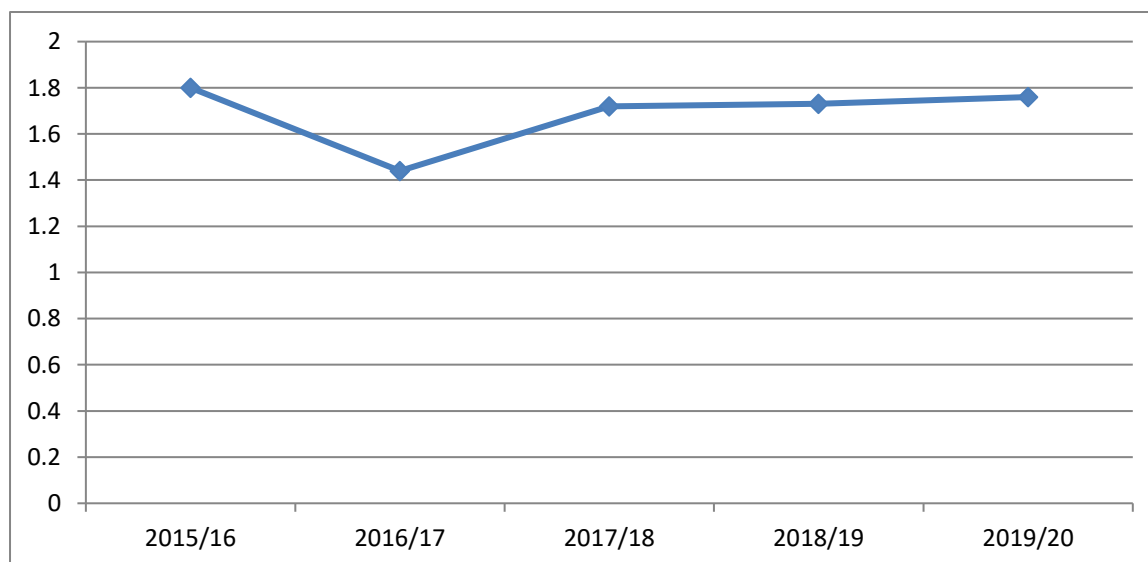


Figure 4.10 shows the comparative analysis of pattern of NPL of Nepalese commercial banks. The graph shows the trend and pattern of average NPL of Nepalese commercial

banks which has been decreasing from 2015/16 to 2016/17 and increasing from 2016/17 onwards.

4.2.3. Test of Normality

Normality tests are used to determine if a data set is well-modeled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed.

Table 4.10
Normality test for dependent and independent variable

Variables	N	Skewness		z value	Kurtosis		z value
		Statistic	Std. Error		Statistic	Std. Error	
ROA	15	0.423	0.580	0.729	0.239	1.121	0.213
ROE	15	0.328	0.580	0.566	-0.180	1.121	-0.161
NIM	15	0.543	0.580	0.936	-0.625	1.121	-0.558
LR	15	-0.219	0.580	-0.378	1.359	1.121	1.212
DR	15	-0.057	0.580	-0.098	-1.413	1.121	-1.260
TBR	15	0.429	0.580	0.739	-1.981	1.121	-1.767
RRP	15	0.354	0.580	0.610	-1.786	1.121	-1.593
CA	15	0.928	0.580	1.60	-0.307	1.121	-0.274
LQ	15	0.304	0.580	0.524	-1.137	1.121	-1.014
NPL	15	0.797	0.580	1.374	-1.470	1.121	-1.311
Valid N (listwise)	15						

Source: SPSS

In the above table, the z-value for skewness and kurtosis has been calculated by the division of skewness and kurtosis measure by their respective standard error. Since, the given data set has the number of observations less than 50, the range of z-value for the purpose of our data to be normally distributed should be from -1.96 to +1.96. The data shown in the above table clearly shows that our z-value for both skewness and kurtosis lies in between the required range of -1.96 to +1.96. Therefore, we can conclude that our data are approximately normally distributed, in terms of skewness and kurtosis and are good for further test.

4.2.4. Descriptive analysis

Descriptive analysis summarizes the main features of the study variables. It is made to understand the facts regarding the dependent and independent variables. The descriptive statistics includes mean, standard deviation, maximum value and minimum value. Descriptive Statistics of dependent and independent variables are presented in table 4.10. The given table indicates the descriptive statistics of Nepalese commercial banks. The study period is 2015/16 to 2019/20 associated with 3 sample commercial banks of Nepal.

Table 4.11

Descriptive Statistics of dependent and independent variables

This shows the descriptive statistics of dependent variables (ROA, ROE and NIM) and independent variables (loan rate, deposit rate, Treasury bill rate, Reverse repo rate) and control variables (capital adequacy, liquidity and non performing loan). The descriptive statistics include mean, standard deviation, maximum and minimum which were computed using SPSS version 25.

	N	Minimum	Maximum	Mean	Standard Deviation
ROA	15	0.97	2.61	1.79	0.45
ROE	15	11.98	27.41	19.03	4.53
NIM	15	2.78	4.84	3.59	0.66
Loan Rate	15	5.9	11.74	8.96	1.36
Deposit Rate	15	1.24	6.71	3.88	1.97
Treasury Bill Rate	15	0.79	4.97	2.59	1.82
Reverse Repo rate	15	0.21	1.9	0.96	0.69
Capital Adequacy	15	10.39	22.99	14.84	3.95
Liquidity	15	23.79	57.44	38.03	11.55
Non-Performing Loan	15	0.15	4.75	1.69	1.92

Source: SPSS

The average value of ROA of selected commercial banks is 1.79 percent with the standard deviation of 0.45 percent and the minimum and maximum range from 0.97 to 2.61 percent. The average value of ROE of selected commercial banks is 19.03 percent with the standard deviation of 4.53 percent and the minimum and maximum range from 11.98 percent to 27.41 percent. The average value of NIM is 3.59 percent with standard deviation of 0.66 percent and the minimum and maximum range from 2.78 percent to 4.84 percent. Similarly, the average value of LR is 8.96 percent with a standard deviation of 1.36 percent and the minimum and maximum range from 5.9 percent to 11.74 percent. The average value of DR is 3.88 percent with the standard deviation of 1.97 percent and the minimum and maximum range from 1.24 percent to 6.71 percent. In the same way, the average value of TBR is 2.59 percent with the standard deviation of 1.97 percent and the minimum and maximum range from 0.79 percent to 4.97 percent. The average value of RRP is 0.96 percent with the standard deviation of 0.74 percent and the minimum and maximum range from 0.21 percent to 1.90 percent. The average value of CA is 14.84 percent with the standard deviation of 3.95 percent and the minimum and maximum range of 10.39 percent to 22.99 percent. The average value of LQ is 38.03 percent with the standard deviation of 11.55 percent and the minimum and maximum range from 23.79 percent to 57.44 percent. Finally, the average value of NPL is 1.69 percent with a standard deviation of 1.92 percent and the minimum and maximum range of 0.15 percent to 4.75 percent.

4.2.5. Correlation analysis

This section of the study presents the results and discussions of the Pearson correlation analysis. Pearson correlation coefficients were used to identify the relationship among the variables of financial ratio and bank performance. The correlation coefficients show the extent and direction of the linear relationship between market interest rate factors, i.e. Loan Rate, Deposit Rate, Treasury Bill Rate and Reverse Repo Rate along with control variables, i.e. Capital Adequacy, Liquidity, Non-Performing Loan and each bank profitability measures of Nepalese commercial banks.

A strong or a 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 coefficient 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 and value of 0.00 means that there is no relationship between the variables that are being tested.

The following table 4.11 shows the Pearson correlation between the dependent variable ROA and independent variables.

Table 4.12

Correlation matrix for ROA and independent variables

This table reveals the Pearson correlation coefficients between the variables used in this study. In this table ‘’ sign indicates that correlation is significant at the 0.05 level and ‘**’ sign indicates that correlation is significant at the 0.01 level.*

Variables	ROA	LR	DR	TBR	RRP	CA	LQ	NPL
ROA	1							
LR	0.199	1						
DR	-0.291*	0.721**	1					
TBR	0.372	-0.589*	0.305	1				
RRP	0.135	0.157	0.195	-0.388	1			
CA	0.613*	-0.083	0.192	0.166	0.068	1		
LQ	0.429	-0.452	-0.434	-0.245	0.198	0.595*	1	
NPL	0.009*	0.077	-0.663**	0.010	-0.032	-0.621*	-0.050	1

Source: SPSS

Table 4.12 reveals that ROA is positively correlated with CA and NPL recorded at 0.613 and 0.009 which are also significant at 5 percent level of significance. The ROA is positively correlated with Loan Rate, Treasury Bill Rate, Reverse Repo and Liquidity but due to the insignificance, this result cannot be accepted. Deposit Rate and ROA also have negative and significant correlation coefficient recorded as -0.291 and it is also statistically significant at 5 percent level of significance. Deposit Rate and Loan Rate have positive and significant correlation coefficient recorded as 0.721 and it is also statistically significant at 1 percent level of significance. Treasury Bill Rate and Loan Rate are negatively correlated and significantly correlation coefficient recorded at -0.589 at 5 percent level of significance. Likewise, Loan rate and Deposit rate are positively correlated with Reverse repo rate but due to the insignificance, this result cannot be

accepted. Similarly, Capital adequacy and Deposit rate, Non-Performing Loan and Loan Rate are positively correlated but the results cannot be accepted due to the insignificance.

Table 4.13 shows the correlation matrix for the dependent variable ROE and independent variables of the sample commercial banks for the five years period.

Table 4.13
Correlation matrix for ROE and independent variables

This table reveals the Pearson correlation coefficients between the variables used in this study. In this table ‘’ sign indicates that correlation is significant at the 0.05 level and ‘**’ sign indicates that correlation is significant at the 0.01 level.*

Variables	ROE	LR	DR	TBR	RRP	CA	LQ	NPL
ROE	1							
LR	0.058*	1						
DR	-0.424	0.721**	1					
TBR	0.055	-0.589*	0.305	1				
RRP	-0.132	0.157	0.195	-0.388	1			
CA	-0.479	-0.083	0.192	0.166	0.068	1		
LQ	-0.113	-0.452	-0.434	-0.245	0.198	0.595*	1	
NPL	0.644**	0.077	-0.663**	0.010	-0.032	-0.621*	-0.050	1

Source: SPSS

Table 4.13 indicates that ROE is positively related to Non-Performing Loan and has a significant correlation coefficient at 1 percent level of significance. ROE is also positively correlated with Loan rate which is significant at 5 percent level of significance. In the same way, Treasury Bill Rate is positively related to ROE and negatively related to Deposit Rate, Reverse Repo Rate, Capital Adequacy and Liquidity but due to the insignificance, this result cannot be accepted. Deposit Rate and Loan Rate also have positive and significant correlation coefficient recorded as 0.721 and it is also statistically significant at 1 percent level of significance. Treasury Bill Rate and Loan Rate are negatively correlated and significantly correlation coefficient recorded at -0.589 at 5 percent level of significance. Likewise, Loan rate and Deposit rate are positively

correlated with Reverse repo rate but due to the insignificance, this result cannot be accepted. Similarly, Capital adequacy and Deposit rate, Non-Performing Loan and Loan Rate are positively correlated but the results cannot be accepted due to the insignificance.

Table 4.14 shows the correlation matrix for the dependent variable NIM and independent variables of sample commercial banks for the five years period.

Table 4.14
Correlation matrix for NIM and independent variables

This table reveals the Pearson correlation coefficients between the variables used in this study. In this table ‘’ sign indicates that correlation is significant at the 0.05 level and ‘**’ sign indicates that correlation is significant at the 0.01 level.*

Variable	NIM	LR	DR	TBR	RRP	CA	LQ	NPL
NIM	1							
LR	0.232**	1						
DR	-0.380*	0.721**	1					
TBR	0.594*	-0.589*	0.305	1				
RRP	0.122	0.157	0.195	-0.388	1			
CA	0.115	-0.083	0.192	0.166	0.068	1		
LQ	-0.054	-0.452	-0.434	-0.245	0.198	0.595*	1	
NPL	0.704**	0.077	-0.663**	0.010	-0.032	-0.621*	-0.050	1

Source: SPSS

NIM and Loan Rate and Non-Performing Loan have positive correlation coefficients recorded at 0.232 and 0.704 which are also significant at 1 percent level of significance. However, NIM and Deposit Rate have negative and significant correlation coefficient recorded as -0.380 while NIM and TBR are positively significant recorded as 0.594 and they are statistically significant at 5 percent level of significance. The NIM is positively correlated with Reverse Repo Rate, Capital Adequacy and negatively related to Liquidity but due to the insignificance, this result cannot be accepted. Deposit Rate and Loan Rate also have positive and significant correlation coefficient recorded as 0.721 and it is also

statistically significant at 1 percent level of significance. Treasury Bill Rate and Loan Rate are negatively correlated and significantly correlation coefficient recorded at -0.589 at 5 percent level of significance. Likewise, Loan rate and Deposit rate are positively correlated with Reverse repo rate but due to the insignificance, this result cannot be accepted. Similarly, Capital adequacy and Deposit rate, Non-Performing Loan and Loan Rate are positively correlated but the results cannot be accepted due to the insignificance.

4.2.6. Regression Analysis

The regression of independent variables (market interest rate factors and control variables) on bank profitability has been analyzed by defining bank profitability in terms of ROA, ROE and NIM. In order to test the statistical significance of the result, multiple regression models have been used.

Table 4.15

Regression of market interest rates and control variables on Return on Assets

The results are based on 5 years (2015/16 to 2019/20) time series data of 3 commercial banks by using linear regression model. The model is $ROA_t = \beta_0 + \beta_1 LR_t + \beta_2 DR_t + \beta_3 TBR_t + \beta_4 RRP_t + \beta_5 CA_t + \beta_6 LQ_t + \beta_7 NPL_t + \varepsilon_t$

Dependent Variable	ROA
Independent Variable	Coefficient
LR	0.068 (0.40)
DR	-0.118 (0.71**)
TBR	0.115 (1.35)
RRP	0.129 (0.73)
CA	0.113 (2.37*)
LQ	0.015 (1.09)
NPL	0.057 (0.43**)
Constant	1.252
R Square	0.780
F	3.547
Key	
p-value < 0.01	***
p-value < 0.05	**
p-value < 0.1	*

Source: SPSS

Note: Figures in the brackets are t-values.

Table 4.15 represents the status of model and the relations of ROA to its independent variables. The value of R square is 0.780 i.e., 78% of variation in ROA is affected by the independent variables (loan rate, deposit rate, treasury bill rate, reverse repo rate, capital adequacy, liquidity and non-performing loan). The value of F is 3.547 which does not show the significance as a result of which it does not fit the overall model very well. However, the result indicates significance as per the individual variables.

Beta is used to see whether there exists any significant relationship between two variables (independent and dependent) or not. The beta coefficient is positive for Non-Performing Loan. Thus, increase in Non-Performing Loan would increase the ROA where beta coefficient is significant at 5 percent level of significance. Similarly, the beta coefficient is negative for Deposit Rate. Thus, increase in Deposit Rate would decrease the ROA where beta coefficient is significant at 5 percent level of significance. Also, the beta coefficient is positive for Capital Adequacy. Thus, increase in Capital Adequacy would increase in ROA where beta is significant at 10 percent level of significance. The beta coefficients are positive for Loan Rate, Treasury Bill Rate, Reverse Repo Rate and Liquidity. The result indicates that higher the Loan Rate, Treasury Bill Rate, Reverse Repo Rate and Liquidity; higher would be the ROA. However the beta coefficients of these variables are not significant.

Table 4.16**Regression of market interest rates and control variables on Return on Equity**

The results are based on 5 years (2015/16 to 2019/20) time series data of 3 commercial banks by using linear regression model. The model is $ROE_t = \beta_0 + \beta_1 LR_t + \beta_2 DR_t + \beta_3 TBR_t + \beta_4 RRP_t + \beta_5 CA_t + \beta_6 LQ_t + \beta_7 NPL_t + \varepsilon_t$

Dependent Variable	ROE
Independent Variable	Coefficient
LR	2.924 (1.172*)
DR	-2.521 (-1.023)
TBR	0.387 (0.309)
RRP	-0.561 (-0.216)
CA	-0.209 (-0.299)
LQ	-0.044 (-0.212)
NPL	0.317(0.161**)
Constant	9.459
R Square	0.531
F	1.134
Key	
p-value < 0.01	***
p-value < 0.05	**
p-value < 0.1	*

Source: SPSS

Note: Figures in the brackets are t-values.

Table 4.16 shows the status of model and the relations of ROE to its independent variables. The value of R square is 0.531 i.e., 53.1% of variation in ROA is affected by the independent variables (loan rate, deposit rate, treasury bill rate, reverse repo rate, capital adequacy, liquidity and non-performing loan). The value of F is 1.134 which does not show the significance as a result of which it does not fit the overall model very well. However, the result indicates significance between the individual variables. Beta is used to see whether there exists any significant relationship between two variables (independent and dependent) or not.

The beta coefficients are negative for Deposit Rate, Reverse Repo Rate, Capital Adequacy and Liquidity while it is positive for Treasury Bill Rate. The result indicates that increase in Deposit Rate, Reverse Repo Rate, Capital Adequacy and Liquidity would decrease the ROE while increase in Treasury Bill Rate would increase the ROE. However, the beta coefficients of these variables are not significant. Similarly, the result indicates that the beta coefficient is positive for Loan Rate. The result indicates that higher the Loan Rate, higher would be the ROE of Nepalese Commercial Banks where beta coefficient is significant at 10 percent level of significance. Also, beta coefficient is positive for Non-Performing Loan which means that higher the non-performing loan, higher the ROE at 5 percent level of significance.

Table 4.17

Regression of market interest rates and control variables on Net Interest Margin

The results are based on 5 years (2015/16 to 2019/20) time series data of 3 commercial banks by using linear regression model. The model is $NIM_t = \beta_0 + \beta_1 LR_t + \beta_2 DR_t + \beta_3 TBR_t + \beta_4 RP_t + \beta_5 CA_t + \beta_6 LQ_t + \beta_7 NPL_t + \varepsilon_t$

Source: SPSS

Dependent Variable	NIM
Independent Variable	Coefficient
LR	0.058 (0.447*)
DR	-0.102 (-0.793*)
TBR	0.219 (3.347**)
RRP	0.160 (1.183)
CA	0.052 (1.434)
LQ	-0.003 (-0.320)
NPL	0.240 (2.331*)
Constant	1.695
R Square	0.940
F	15.55***
Key	
p-value < 0.01	***
p-value < 0.05	**
p-value < 0.1	*

Note: Figures in the brackets are t-values.

Table 4.17 represents the status of model and the relations of NIM to its independent variables. The value of R square is 0.940 i.e., 94% of variation in NIM is affected by the independent variables (loan rate, deposit rate, treasury bill rate, reverse repo rate, capital adequacy, liquidity and non-performing loan). The value of F is 15.55 which is significant at 1 percent level significance as a result of which it fits the overall model very well. Also, the result indicates significance between the individual variables. Beta is used to see whether there exists any significant relationship between two variables (independent and dependent) or not.

The table indicates that beta coefficients are positive for Loan Rate and Non-Performing Loan. Thus, increase in Loan Rate and Non-Performing Loan would increase the NIM where beta coefficients of these variables are significant at 10 percent level of significance. Similarly, the beta coefficient is negative for Deposit Rate. Thus, increase in Deposit Rate would decrease the NIM. Also, beta coefficient is negative for Liquidity which means that increase in Liquidity would decrease the NIM. However, the beta coefficient of this variable is not significant. The beta coefficients are positive for Reverse Repo Rate and Capital Adequacy. The result of the table reveals that higher the Reverse Repo Rate and Capital Adequacy; higher would be the NIM. However, the beta coefficients of these variables are not significant. Similarly, the result indicates that the beta coefficient is positive for Treasury Bill Rate. This means that increase in Treasury Bill Rate would increase in NIM where the beta coefficient is significant at 5 percent level of significance. Hence, the beta coefficients are positively significant for Loan Rate, Non-Performing Loan and Treasury Bill Rate which shows the significant impact on Net Interest Margin of Nepalese Commercial Banks.

4.2.7. Discussion

This chapter presents the result of the secondary data. The result has been generated by using correlation analysis, regression analysis and descriptive statistics and the data has been interpreted using SPSS software. Data findings are discussed below:

Descriptive statistics are shown in table 4.11. The first dependent variable ROA has an average value of 1.79 which means that the commercial banks of Nepal are able to efficiently generate net income by using the resources of the bank. Second dependent

variable ROE has an average value of 19.03 which shows that the bank management is not able to properly utilize the shareholder's funds. Likewise, the third dependent variable NIM has an average value of 3.59 which shows the effectiveness of investment decisions of commercial banks of Nepal.

The primary objective of the study was to examine the impact of market interest rate fluctuations on profitability of commercial banks of Nepal in terms of ROA, ROE and NIM. The study concluded that there is a strong impact of loan rate and deposit rate on NIM of Nepalese commercial banks. This result is consistent with the result of Demirguc-Kunt and Huizinga (1999) and Musah et al. (2018) which shows that deposits and loans are considered to be the most important balance sheet indicators because they represent a sign of traditionalism of banking activities. Lending Rate and Deposit Rate are found to be strongly correlated with each other which are similar to the results of Felicia (2011) and Olokoyo (2011) which show that deposits of commercial banks have the greatest impact on their lending behavior. Thus, the study suggests that commercial banks should focus on mobilizing more deposits as this will enhance their lending performance and should formulate critical, realistic and comprehensive strategic and financial plans. However, Bhattarai (2015) show that loan rates have a positive significant impact on ROA while the deposit rates have a negligible impact on ROA which is contrary to our findings. The reason between the differences in the results could be the difference in the size of sample and the time frame taken for the study.

The study shows that Short term money market instruments like Reverse Repo has no significant impact on economic activities of a country and hence the bank performance variable measured as ROA, ROE and NIM which is similar to the reviewed research of Sun, Gan, & Hu (2010). Their studies show the relationships between monetary aggregate (M2) and short-run money market interest rates and suggested that the short-run interest rates do not have significant influence on the monetary aggregate concluding that short run money market interest rates are ineffective as a monetary policy-operating objective. However, this finding is in complete contradiction with Godspower-Akpomiemie (2012) which shows that Reverse Repo has a significant positive relation with profitability and the net worth of commercial banks. It is also found that Treasury Bill Rate has a positive significant impact on NIM which again contradicts with the findings of Sun, Gan & Hu (2010). The contradictions might be because of the differences in the monetary policy of

central bank of the respective countries and also due to the macroeconomic situation of each particular country where the researches were conducted.

Non-Performing Loan has a positive and significant impact on the profitability of Nepalese Commercial Banks measured by ROA, ROE and NIM which is consistent with the findings of Islam et al. (2017) thereby, contradicting with the findings of Godspower-Akpomiemie (2012) which finds insignificance between Non-Performing Loan and profitability. In the same way, the study shows that Capital Adequacy and Liquidity have no significant impact on profitability of Nepalese commercial banks. The results are consistent with Anbar & Alper (2011) and Bhatt & Verghese (2018). However, the study shows a significant impact of Capital Adequacy on ROA of Nepalese Commercial banks thus supporting the results of Budathoki & Rai (2020) but, on the other hand, contradicting the findings of Godspower Akpomiemie (2012). To sum up, most of the findings of this study are inconsistent with many of the studies conducted in other countries across the globe. Thus, it is worthwhile to note that the nature of data, macroeconomic situation, sample size and the specification of models may be responsible for the differences in the results. Due to this reason, conclusions drawn should be interpreted within these limitations only.

CHAPTER V- SUMMARY AND CONCLUSIONS

This chapter presents the summary of the entire study and highlights the major findings of the study. Furthermore, the major conclusions are discussed in separate section of this chapter which is followed by some implications and the recommendations regarding the market interest rates and their effect on profitability of Nepalese Commercial Banks. This chapter emphasizes at the dialogue and the interpretation of the research outcomes. Except all that, this chapter provides an interpretation of information that is generated from the essential findings and comes at a certain conclusion. Finally, the chapter ends with the scope of the future research in the same field.

5.1. Summary of findings

Banks plays a vital role in the allocation of resources. Bank is such institution which collects deposits from surplus units and provides deposits to deficit units in the society. Bank collects capital from one group of depositors and disburses it to those who seek the capital. The strength of economy of any country basically depends on the strength and efficiency of financial system, which, in turn, depends upon a sound banking system. Considering the scenario of market interest rates around the world and the research gaps in Nepalese context, this study is mainly focused on examining the relationship between market interest rates along with control variables and financial performance of Nepalese commercial banks.

The main objective of the study was to determine the impact of market interest rate fluctuations in profitability of commercial banks of Nepal while the secondary objective was to analyze the trend of market interest rates and to examine the impact of loan rate, deposit rate, treasury bill rate, reverse repo rate, capital adequacy, liquidity and non-performing loan in the performance and efficiency of commercial banks of Nepal. To achieve the objectives, descriptive and causal comparative research design has been used. The study has utilized secondary sources of data, i.e. the overall efficiency of the banks in Nepal has been evaluated using secondary data.

The population for the research was 27 commercial banks of Nepal that are currently in operation out of which 3 banks have been taken as sample. Analysis of data is the most important and critical phase for study. Different tools were used to analyze the same by the researcher to draw meaningful conclusion. In this study SPSS (Statistical Package for Social Sciences), Microsoft Excel and Microsoft word were used to analyze the data. With the help of these tools, few statistical techniques such as mean, standard deviation, correlation and regression were calculated. The summary of descriptive statistics associated with dependent and independent variables of sample banks were explained to show the cross-sectional characteristics of these variables during the sample period. Correlation analysis was undertaken to analyze the degree of relationship between all variables. A multiple regression model was applied to estimate the relationship between dependent variables (ROA, ROE and NIM) and explanatory variables (market interest rates and control variables).

Based on the analysis of the data, the major findings of the study are summarized as follows:

- a) In this study, it was observed that short run money market interest rate like Treasury bill rate has a significant impact on NIM while Reverse repo Rate have no significant impact on bank performance measured by ROA, ROE and NIM in Nepalese Banking Sector.
- b) Capital Adequacy and Non-Performing Loan have a positive significant impact on Return on Assets while Deposit rate has a negative significant impact on ROA.
- c) There is positive effect of Loan rate, Treasury bill rate, Reverse repo rate and Liquidity on Return on Assets. All these positively affecting variables show the insignificant relationship with ROA.
- d) The study showed that the impact of deposit rate, reverse repo rate, capital adequacy and liquidity is negative on ROE in Nepalese banking sector. The result reveals that higher the deposit rate, reverse repo rate, capital adequacy and liquidity, lower would be the return on equity. All negatively variables show the insignificant relationship with ROE.
- e) There is positive impact of Loan rate and Non-Performing Loan on Return on Equity. This means that higher the Loan rate and Non-Performing Loan, higher would be the ROE.

- f) There is positive impact of loan rate, Treasury bill rate and non-performing loan with Net interest margin in Nepalese banking sector. The result indicates that higher the loan rate, Treasury bill rate and non-performing loan, higher would be the Net interest margin. Also, there is negative impact of Deposit Rate on NIM which means that higher the Deposit Rate, lower would be the NIM.
- g) Liquidity has a negative impact on Net interest margin. The result indicates that higher the liquidity, lower would be the Net interest margin. Also, Reverse repo and Capital Adequacy have positive impact on NIM which means that higher the Reverse repo and Capital adequacy, higher the NIM. But these variables are not significant.

5.3. Conclusion

Based on the findings, the following conclusions are drawn:

- a) The study revealed that Loan Rate has significant positive relationship with Net Interest Margin and Return on Equity. Hence, the bank willing to increase NIM and their return to shareholders should increase their loan rate.
- b) The study observed a significant negative relationship between deposit rate and profitability proxies measured by ROA and NIM. Hence the bank willing to increase their Return on Assets and Net Interest Margin should decrease their deposit rate.
- c) The study observed a positive significant relationship between Non Performing Loan and Bank efficiency variables measured by Return on Assets, Return on Equity and Net Interest Margin. Hence in order to increase the return on assets, return on equity and net interest margin by the banks, non-performing loan should be increased. This implies that in order to increase the short term earnings, banks' management should portray wrong picture to the investors relating the future profitability and positive return prospects. Consequently, investors start borrowing from the banks and invest in the less profitable projects. This results in the current good performance and profitability of the banks but because of the wrong forecasting, returns on the investments are not according to the investors' expectation, resulting in the inability of the investors in repayment of loans thus leading to the growth in NPL.

- d) Non-performing loans are a measure of credit risk. Hence, the higher the level of non-performing loans, the higher the credit risk and consequently the higher will be the interest margin. Hence the bank covers the losses from these kinds of loans by passing the additional costs to its clients through higher interest rates for loans or lower rates for deposits, or a combination of both.
- e) It could be advised to maximize owners' equity. Nepalese commercial banks should concentrate more on forecasting and controlling the determinants of the interest rates, rather than the interest rate itself.
- f) The study identified a positive relationship between Reverse Repo Rate with Return on assets and Net interest margin. Increase in Reverse Repo Rate lead to increase the bank performance. Hence, in order to increase bank performances, Reverse Repo Rate should be increased.
- g) An increase in Reverse repo rate causes the banks to transfer more funds to the central bank, because banks earn attractive interest rates and also their money is in safe hands. This results the money being drawn out of the banking system, thus banks are left with lesser funds. Consequently, banks would have lesser funds to lend to their customers. This helps to control the flow of excess money into the economy.
- h) The study observed a negative relationship between Liquidity and bank performance variables measured by return on equity and net interest margin of Nepalese commercial banks. Hence, the bank willing to increase their bank performance should manage their liquidity and invest their money in such productive sectors which would increase their bank performances.

5.3. Implications

This research is limited to measuring the effect of market interest rates in the profitability of Nepalese Commercial banks considering few variables like loan rate, deposit rate, Treasury bill rate, reverse repo rate, capital adequacy, liquidity and non-performing loan. However, this is not always the case in real organizational settings. Various other factors like supply and demand for credit, competition in the loanable market, and other economic factors, such as inflation rate, expectation of investors and monetary policy of the government to mention the least, impact the interest rates, which also matter to

organizations for determining the profitability and thus, should be analyzed and tested in future studies.

In addition, there is room for future researchers and practitioner to investigate into alternative pathways that can link market interest rates with profitability of commercial banks. This study is based only in the secondary data. Future studies could include primary study and wide coverage of all commercial banks and manufacturing industries. Also, this study focused only on the different market interest rates. Future studies could include both market interest rates and factors that affect fluctuations of market interest rates.

References

- Anbar, A., & Alper, D. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. *Business and economics research journal*, 2(2), 139-152.
- Alayi, J., Jafarov, J., & Akbarli, F. (2020). The determinants of credit interest rates in Azerbaijan. *ASERC Journal of Socio-Economic Studies*, 3(1), 46-53.
- Bhatt, S., & Verghese, N. (2018). Influence of Liquidity on Profitability: Evidence from Nepalese Banks. *International Journal of Multidisciplinary and Current research*, 6, 1085-1090.
- Bhattarai, Y. R. (2015). Determinants of lending interest rates of Nepalese Commercial Banks. *Economic Journal of Development Issues*, 19(1), 39-59.
- Budhathoki, P. B., & Rai, C. K. (2020). The Effect of Specific Factors on Bank Profitability: Evidence from Nepalese Banks. *Journal of Economics and Business*, 3(1), 82-89.
- Cornett, M. M., & Saunders, A. (2003). *Financial institutions management: a risk management approach*. Irwin: McGraw-Hill.
- Delis, M. D., & Kouretas, G. P. (2011). Interest rates and bank risk-taking. *Journal of Banking & Finance*, 35(4), 840-855.
- Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: some international evidence. *The World Bank Economic Review*, 13(2), 379-408.
- Deniz, P., & Aslanoğlu, E. (2019). *Current issues in Turkish economy: determinants of interest rates*, Berlin: BAU publications.
- Duttweiler, R. (2011). *Managing liquidity in banks: a top down approach*. United Kingdom: John Wiley & Sons.
- Fabozzi, F.J. & Modigliani, F. (2003). *Capital markets: institutions and instruments*, (3rd ed.). California: Prentice Hall.
- Farlex (2009). *Financial Dictionary*: Retrieved from <http://financialdictionary.thefreedictionary.com>.
- Financial Glossary. (2011). Retrieved from <https://financial-dictionary.thefreedictionary.com/Market+interest+rate>.

- Felicia, O. (2011). Determinants of commercial banks' lending behaviour in Nigeria. *International Journal of financial research*, 2(2), 1-12.
- Flannery, M. J. (1981). Market interest rates and commercial bank profitability: An empirical investigation. *The Journal of Finance*, 36(5), 1085-1101.
- Gaire, H. N. (2012). Real interest rate and saving behavior in Nepal. *Banking journal*, 2(1), 16-34.
- Gbadebo, A. & Ogbonna, K. (2019). Marketing interest rates and deposit money banks profitability in Nigeria. 3. 220-231.
- Godspower-Akpomemie, E. I. (2012). *Market interest rate fluctuations: impact on the profitability of commercial banks* (Doctoral dissertation).
- Haddawee, A.H. & Hammood, H. (2020). The Relationship between Bank Deposits and Profitability for Commercial Banks. *International Journal of Innovation, Creativity and Change*, 13(7), 226-234.
- Hanweck, G. A., & Kilcollin, T. E. (1984). Bank profitability and interest rate risk. *Journal of Economics and Business*, 36(1), 77-84.
- Hossain, D. A. (2020). Determinants of Profitability of Commercial Banks in Bangladesh. *International Journal of Science and Business*, 4(9), 1-16.
- Islam, M. A., Sarker, M. N. I., Rahman, M., Sultana, A., & Prodhan, A. S. (2017). Determinants of Profitability of Commercial Banks in Bangladesh. *International Journal of Banking and Financial Law*, 1(1), 1-11.
- Kaufman, H. (1986). *Interest Rates, the market, and the new financial world*, New York: Crown.
- Karlyn, M. (1984). Capital Adequacy at commercial banks. *The journal of economic review*, 69(9), 17-30.
- Kassim, S. H., Majid, M. S. A., & Yusof, R. M. (2009). Impact of monetary policy shocks on the conventional and Islamic banks in a dual banking system: Evidence from Malaysia. *Journal of Economic Cooperation and Development*, 30(1), 41-58.
- Khan, W. A., & Sattar, A. (2014). Impact of interest rate changes on the profitability of four major commercial banks in Pakistan. *International journal of accounting and financial reporting*, 4(1), 142.
- Lantara, I. (2014). Business and Economics Cycle, Financial Market Fluctuation, and Bank Profitability: Empirical Evidence from Indonesia. Retrieved from <http://dx.doi.org/10.2139/ssrn.2396795>

- López-Espinosa, G., Moreno, A., & de Gracia, F. P. (2011). Banks' net interest margin in the 2000s: A macro-accounting international perspective. *Journal of International Money and Finance*, 30(6), 1214-1233.
- Madura, J. (1989). *Financial markets and institutions*. New York, West Publishing Company, 22-39.
- Monetary Policy. (2020). Retrieved from <http://www.nrb.org.np>
- Muriithi, J. G., Muturi, W. M., & Waweru, K. M. (2016). The Effect of Market Risk on Financial Performance of Commercial Banks in Kenya. *Journal of Finance and Accounting*, 4(4), 225-233.
- Musah, A., Anokye, F. K., & Gakpetor, E. D. (2018). The Impact of Interest Rate Spread on Bank Profitability in Ghana. *European Journal of Business, Economics and Accountancy*, 6(1), 27-39.
- Olokoyo, F. O. (2011). Determinants of commercial banks' lending behavior. *International Journal of financial research*, 2(2), 61.
- Paudel, N. (2020). Covid-19: Impact on the banking sector. The Kathmandu Post. Retrieved from <http://www.kathmandupost.com>
- Rose, P. S., & Hudgins, S. C. (2012). *Bank management & financial services*, (9th ed.). New York.
- Rose, P.S., and Kolari, J.W. (1995): *Financial Institutions: understanding and managing financial services*, (5th Ed.). Irwin: McGraw-Hill.
- Saha, A., Subramanian, V., Basu, S., & Mishra, A. K. (2009). Networth exposure to interest rate risk: An empirical analysis of Indian commercial banks. *European journal of operational Research*, 193(2), 581-590.
- Shrestha, M. (2020). Covid's impact on BFIs: An outlook. The Himalayan Times. Retrieved from <http://www.thehimalayantimes.com>
- Shrestha, P.N., (2011). UK Essays Retrieved From <http://www.ukessays.com/dissertation/literature-review/interest-rates-andprofit.php>
- Shrestha, R. (2016). Determinants of commercial banks' interest margin in Nepal. *Nepalese Journal of Business*, 117.
- Shrestha, R. (2020). Covid-19 and the Nepali banking sector. Nepal Economic Forum. Retrieved from <http://www.nepaleconomicforum.org>

- Sufian, F., & Kamarudin, F. (2012). Bank-specific and macroeconomic determinants of profitability of Bangladesh's commercial banks. *The Bangladesh Development Studies*, 35(4), 1-28.
- Sun, S., Gan, C., & Hu, B. (2010). The effects of short-term interest rates on output, price and exchange rates. *The International Journal of Business and Finance Research*, 4(3), 113-131.
- Thygeson, K. J. (1995). *Management of financial institutions*, (1st ed.), Harpe Collins: College Publishers.
- Tumwine, S., Sejaaka, S., Bbaale, E., & Kamukama, N. (2018). Determinants of interest rate in emerging markets. *World Journal of Entrepreneurship, Management and Sustainable Development*, 14(3), 267-290.

APPENDIX

Data of market interest rates of sample commercial Banks from 2015/16-2019/20

Banks	Time	Loan Rate	Deposit Rate	Treasury Bill Rate	Reverse Repo Rate
Standard Chartered Bank Nepal Limited	2015/16	5.90	1.26	0.79	0.21
	2016/17	8.07	3.06	1.45	1.58
	2017/18	9.47	4.41	4.48	0.4
	2018/19	9.50	5.05	4.97	0.7
	2019/20	8.47	4.84	1.27	1.9
Rastriya Banijya Bank Limited	2015/16	8.32	1.27	0.79	0.21
	2016/17	7.78	1.24	1.45	1.58
	2017/18	9.20	1.76	4.48	0.4
	2018/19	8.97	2.59	4.97	0.7
	2019/20	9.63	3.30	1.27	1.9
NIC ASIA Bank Limited	2015/16	7.77	4.41	0.79	0.21
	2016/17	9.10	5.61	1.45	1.58
	2017/18	10.12	6.53	4.48	0.4
	2018/19	11.74	6.71	4.97	0.7
	2019/20	10.39	6.21	1.27	1.9

Banks	Time	Capital Adequacy	Liquidity	Non Performing Loan
Standard Chartered Bank Nepal Limited	2015/16	16.38	47.17	0.32
	2016/17	21.08	56.98	0.19
	2017/18	22.99	43.01	0.18
	2018/19	19.69	47.55	0.15
	2019/20	18.51	57.44	0.44
Rastriya Banijya Bank Limited	2015/16	10.46	45.70	4.25
	2016/17	10.39	37.85	3.77
	2017/18	11.46	35.57	4.75
	2018/19	13.39	30.59	4.59
	2019/20	12.64	41.41	4.08
NIC ASIA Bank Limited	2015/16	12.66	23.79	0.82
	2016/17	13.83	25.80	0.36
	2017/18	12.37	24.45	0.22
	2018/19	13.28	26.05	0.46
	2019/20	13.50	27.09	0.75

Data of dependent variables of sample commercial banks from 2015/16 to 2019/20

Banks	Time	ROA	ROE	NIM
Standard Chartered Bank Nepal Limited	2015/16	1.98	17.18	2.84
	2016/17	1.84	11.98	3.08
	2017/18	2.61	18.66	4.06
	2018/19	2.61	19.49	3.99
	2019/20	1.71	15.15	3.30
Rastriya Banijya Bank Limited	2015/16	1.42	27.41	3.63
	2016/17	1.94	26.53	4.11
	2017/18	1.85	19.19	4.84
	2018/19	2.23	23.39	4.69
	2019/20	1.64	19.01	3.83
NIC ASIA Bank Limited	2015/16	1.51	16.5	2.78
	2016/17	1.64	16.84	2.83
	2017/18	0.97	12.09	3.07
	2018/19	1.56	22.73	3.58
	2019/20	1.32	19.26	3.23

