SECTOR WISE CREDIT CONCENTRATION OF NEPALESE COMMERCIAL BANKS AND ITS IMPACT ON PROFITABILITY

A Dissertation submitted to the Office of the Dean, Faculty of Management, in partial fulfilment of the requirements for the Degree of Masters of Business Studies

by

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CERTIFICATE OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled " **SECTOR WISE CREDIT CONCENTRATION OF NEPALESE COMMERCIAL BANKS AND ITS IMPACT ON PROFITABILITY** " The work of this dissertation has not been submitted previously for the purpose of conferral of any degrees nor has it been proposed and presented as part of requirements for any other academic purposes.

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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REPORT OF RESEARCH COMMITTEE

Ms. Maya Lama has defended research proposal entitled **"Sector Wise Credit Concentration of Nepalese Commercial Banks and its Impact on Profitability"** successfully. The research committee has registered the dissertation for further progress. It is recommended to carry out the work as per suggestion and guidance of supervisor Ramesh Kumar Paudel and submits the thesis for evaluation and viva voce examination.

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APPROVAL SHEET

We, the undersigned, have examined the dissertation **"Sector Wise Credit Concentration of Nepalese Commercial Banks and its Impact on Profitability"** presented Ms. Babita Shrestha candidate for the degree of Master of Business Studies (MBS Semester) and conducted the Viva voce examination of the candidate. We hereby certify that the dissertation is worthy of acceptance.

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ABBREVIATIONS

AD	:	Anno Domini
AIC	:	Akaike information criterion
ATM	:	Automated Tailor Machine
BS	:	Bikram Sambat
DER	:	Debt to Equity Ratio
e.g.	:	Example
F/Y	:	Fiscal Year
i.e.	:	That is
LDR	:	Loan to Deposit Ratio
Ltd	:	Limited
MBS	:	Master of Business Studies
ROA	:	Return on Assets
ROE	:	Return on Equity
SC	:	Schwarz criterion
SD	:	Standard Deviation
SEM	:	Structural Equation Modelling

ABSTRACTS

The aim of this research was to identify the influential determinants of the bank's liquidity risks in Nepal and to analyze the bank's exposure to liquidity risk in the context of Nepal. The research design covers, population and sample, source of data, methods of data analysis. Out of the total financial system, five microfinance companies are chosen for sample purpose; mainly secondary data are used for the analysis. Research methodology is a path from which we can solve research dilemma systematically to accomplish the basic objective of the study. It consists of a brief explanation of research design, nature and sources of data, method of data collection and methods of tools used for analyzing data. This study is based on both descriptive and casual comparative research design and this study is based on secondary data. Secondary data are collected from their respective annual report, other publication and journals of the related banks published by Nepal Rastra Bank, Nepal stock exchange and other related magazines. Ten years data are taken to conduct the study from 2013/14 to 2022/23. For mathematical analysis, various financial and statistical tools like average (mean), standard deviation, regression, correlation and etc. has used. Similarly, SPSS, Spreadsheet, Excel and word has used to perform calculation. Findings shows analysis reveals that the Liquid Assets to Total Assets Ratio (LATA) has no significant relationship with Capital Adequacy Ratio (CAR) or GDP. However, there are moderate negative relationships between LATA and Non-performing Loan (NPL) as well as between LATA and Inflation (IN). Moreover, there is a weak positive relationship between LATA and Return on Equity (ROE), indicating a slight improvement in ROE with an increase in the Liquid Assets to Total Assets Ratio. The factors affecting the liquidity of Nepalese microfinance companies, several important conclusions emerge from the analysis. Firstly, the correlation analysis reveals that the management of non-performing loans (NPL) is of utmost significance

Key words: *Liquid Assets to Total Assets Ratio, Capital Adequacy, Non-performing loan , Return on Equity, Inflation Rate, GDP*

CHAPTER-I

INTODUCTION

1.1 Background of the study

Commercial banks offer loans that helps a number of industries and sectors, including infrastructure development, services, industry, and agriculture. This financial assistance promotes the expansion of these industries, advancing Nepal's economy as a whole. One can consult the reports and publications of Nepal Rastra Bank or the official resources of individual commercial banks for comprehensive and current information on the distribution of credit by commercial banks in Nepal (Gaur & Mohapatra, 2020). Put another way, they are financial intermediaries that play a crucial role in raising capital to expand production volume and trade on both domestic and international markets, which improves job possibilities and speeds up economic acceleration. According to Athanasoglou et al. (2008), countries with robust and profitable banking sectors are more resilient to unfavorable shocks that maintain systemic stability. The majority of businesses rely on commercial banks, one of the key players in the banking industry, as their main source of short-term funding (Pradhan, 2004). It is obvious that the expansion and development of commercial activity in every economy is aided by a robust and long-lasting financial system. As a result, comprehending commercial bank profitability and pinpointing its causes is an essential phenomenon.

Commercial banks in Nepal gather deposits from surplus sectors and lend the money to different economic sectors, thereby providing credit to individuals, businesses, and the government. A vital component of Nepal's economic development is the credit that commercial banks offer to a range of industries. The distribution of credit generally reflects the nation's development objectives and economic strategies, and it is in line with the priorities established by Nepal Rastra Bank, the country's central bank. Commercial banks primarily focus on bank reform, making the most use of available resources, and increasing non-cash reserve transactions in order to close the gap between deposit and credit interest rates. Their main goal is to generate profits by allocating funds received from various sources into various assets. They also contribute significantly to the nation's economic growth and efforts to reduce poverty by offering credit options and first-rate banking services to both the general public

and the corporate community. To accomplish the intended economic growth, all types of banks and financial institutions must work together with the backing of a dynamic central bank policy (Biju, 2013).

The banking industry has a big influence on the health of the economy and is crucial to the survival of the financial markets. A bank's sound financial standing provides a guarantee to its depositors as well as to its shareholders, staff, and the overall economy. In response to this dictum, attempts have occasionally been made to assess each bank's financial standing and administer it in an efficient and effective manner (Sangmi & Nazir, 2010).

A commercial bank is a type of establishment that takes deposits, extends business loans, and provides associated services. A range of deposit accounts, including checking, savings, and time deposits, are also accepted by the bank. These organizations are owned by a group of people and are operated for financial gain. Commercial banks serve individuals as well, but their main focus is on lending to and accepting deposits from businesses. Due to its ability to provide the widest range of financial services required by the economy, commercial banks are also referred to as the financial department store. Commercial banks are the most important privately held financial institution in Nepal and the economies of the majority of major nations. The organization provides the general public with deposit and credit services in addition to an increasing array of more recent and cutting-edge offerings, including financial planning, selling insurance policies, investment advising, and security underwriting (Thapa, 2019).

The amount of the assets and the ratio of non-interest income to assets have been shown by Alper and Anbar (2011) to have a considerable beneficial impact on return on equity and return on assets. Nonetheless, there was a negative correlation between non-performing loans and bank profits. As far as external factors go, the only one that significantly boosts bank profitability as determined by return on equity is the real rate of interest. In the context of Nepali public banks, Gnawali (2018) conducted a study with 104 observations spanning the years 2010 to 2017 and discovered a negative relationship between non-performing loans and return on assets. Furthermore, there is a favorable correlation between the profitability of banks in

Nepal and the capital adequacy ratio, loan to deposit ratio, and loan loss provision. The previous five years have seen a slowdown in the decade-long rapid expansion, and a steady process of consolidation has begun. The NRB is promoting mergers and acquisitions in order to accelerate the process of consolidation. The number of institutions in the financial sector has significantly decreased in recent years. (Bank Rastra Nepal, 2016).

A prevalent presumption that forms the basis of a significant portion of research and discourse on profitability is that higher profitability would inevitably result in enhanced organizational activities and functions. The profitability of businesses has garnered a lot of attention, discussion, and private management of bank organizations on a global scale. A company's profitability can be assessed using a variety of metrics, including return on investment, sales turnover ratio, dividend growth, and profitability. Still up for contention, nevertheless, are the appropriate metrics for gauging a company's success and the variables influencing a company's profitability (Liargovas & Skandalis, 2008).

Commercial banks are essential to the distribution of financial resources among different economic sectors in Nepal. Their lending policies influence the course of growth for various industries in addition to reflecting the state and priorities of the economy. According to current trends, Nepalese commercial banks have a diverse credit portfolio with a focus on services, industry, agriculture, and personal lending (Ongore & Kusa, 2013).

1.2 Problem Statement

There are numerous challenges in gathering disparate finances and allocating them to profitable ventures. Not every educated person can find job in the public or private sectors. The needs of individuals are increasing as a result of liberalization and globalization. However, Nepalese industries are not able to supply Nepalese goods. Recent data from the NRB shows that private sector credit expanded by 4.1 percent annually, while deposits at Banking and Financial Institutions (BFIs) increased by 7.0 percent. Then, our nation's capital is leaving. So, how can one invest in our nation? Numerous opportunities exist for investing and saving. To obtain opportunities for saving and investing, it must learn about the topic of saving and investing. According

to Jha and Hui (2012), banks are expanding at an increasingly rapid pace while making the most of all of their resources.

The majority of isolated locations are not included in Banks' research. The market is now lacking in liquidity. Political parties and industrial labor are on strike. Economic sectors are impacted by these actions. Every year, the government has been unable to utilize the entire development fund. There are a lot of banks in the economy. The government has not been able to guarantee security in schools, colleges, or other locations. It perceives a lack of stability in the government and its investment-related policies in our nation (Pradhan, 2004). Therefore, our government and the relevant industry should focus on removing the investment-related concerns in order to create solid investment policies.

This study's primary focus will be on banks' profitability. Essentially, this study addresses the following publicly available questions about particular commercial banks.

- What is the situation of credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio, bank size and return on assets of commercial banks?
- What is the relationship between credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio, bank size and return on assets of commercial banks?
- What is the impact of credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio, bank size on return on assets of commercial banks?

1.3 Objectives of the study

This study's main goal is to examine how Nepalese commercial banks' loan (credit) concentration and profitability relate to one another. The particular subjects of this study are:

- To compare the situation of credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio, bank size and return on assets of commercial banks

- To examine the relationship between credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio, bank size and return on assets of commercial banks.
- To analyze the impact of credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio, bank size on return on assets of commercial banks.

1.4 Hypothesis

The main objective of developing the hypothesis is to determine whether each independent variable has a significant impact on the dependent variables and to evaluate the significant impact of the independent variables taken together on the dependent variables. The null and alternative hypotheses are as follows:

H1: Credit has a major impact on agriculture and the commercial bank's return on assets in Nepal.

H2: Credit has a major impact on manufacturing and the commercial banks' return on assets in Nepal.

H3: Credit has a major influence on consumer spending and the return on assets of Nepal's commercial banks.

H4: Credit has a major influence on commerce and the return on assets of Nepal's commercial banks.

H5: Capital adequacy has a major effect on the return on assets of Nepal's commercial banks.

H6: The return on assets of Nepal's commercial banks is significantly impacted by the size of the bank.

1.5 Rationale of the study

This study examines Nepal's commercial banks' sector-specific credit concentration and how it affects their profitability. Through an analysis of the distribution of lending across different economic sectors and the impact of this allocation on the financial performance of commercial banks, this research offers important insights into the profitability drivers and operational dynamics of the banking industry. Determining

how successfully banks are managing their credit portfolios to maximize returns while balancing risk requires an understanding of these linkages.

This study looks into how Nepal's commercial banks' profitability is affected by how loan is distributed among various economic sectors. The study looks at the correlation between sector-wise credit concentration and financial performance in an effort to identify important variables affecting these banks' profitability. These kinds of discoveries are extremely important to academics since they add to our understanding of the dynamics of the financial industry and provide suggestions for improving its efficacy and efficiency. In particular, the study pinpoints the industries whose loan allocations have a major impact on bank profitability, offering crucial data to regulators and bank managers alike. These results point to important areas where strategic changes might boost intermediary efficiency and financial performance for bank management. The report provides data-driven recommendations to policymakers that can help mold regulatory procedures to support a prosperous and well-balanced banking industry. By means of this thorough examination, the study contributes to the advancement of both academic understanding and practical decision-making about the attainment of sustainable profitability in the banking sector.

1.6 Limitation of the study

The main limitations of the study are as follows:

1. The study is based on the secondary data and limitation of using secondary data may affect the results.
2. The secondary data was taken from the annual reports of the sample Banks. It may be possible that the idea shown in the annual reports may be window dressed which does not show the actual position of the banks.
3. Researcher used only six independent and one dependent variables among various factors for evaluation profitability of commercial banks.

CHAPTER- II

LITERATURE REVIEW

The theoretical framework and literature review, which are essential components of any dissertation, are covered in this chapter. The researcher employs a variety of sources for the review study, including encyclopedias, reports, reviews and abstracts, indexes, dissertations or research papers published by different institutions, and books and journals.

2.1 Theoretical Review

2.1.1 Credit Concentration Theory

The hazards connected with a bank's loan portfolio being significantly skewed toward a specific industry, geographic area, or borrower are addressed by credit concentration theory. This argument is based on the notion that if unfavorable circumstances impact a particular lending area, concentration in that area might greatly raise the risk of defaults. Decades of financial literature have focused on the idea of credit concentration, which reflects the inherent trade-offs between risk and profit in banking.

Oldrich A. Vasicek is one of the founding authors in the field of credit concentration risks. Vasicek proposed a methodology to assess credit risk in his 1987 key work on the subject, specifically in respect to the concentration of risks within a loan portfolio. His model—often called the Vasicek Model—offered a mathematical framework for comprehending the correlation between credit losses and loans, particularly when such loans are concentrated in specific industries or borrower categories (Vasicek, 1987). This study demonstrated that the likelihood of large losses in the event that defaults occur in the concentrated segments increases with portfolio concentration.

Elizalde and Repullo (2007) built on the concepts of Vasicek by studying the effects of sectoral and geographic concentration on a bank's risk profile, thus deepening the concept of credit concentration. They contended that banks that have a large concentration in particular industries or geographical areas are more susceptible to recessions that have a disproportionate impact on those areas. According to their research, banks must diversify their loan portfolios in order to reduce the risks related to concentration (Elizalde & Repullo, 2007).

Wagner (2010) conducted an analysis on the potential for concentration to worsen systemic risks in the banking industry, thereby delving deeper into the practical implications of Credit Concentration Theory. According to Wagner's research, banks with comparable sectoral exposures may experience significant difficulties as a group during sector-wide crises, which could result in increased financial instability. In order to improve financial stability, he supported regulatory actions that would reduce portfolio concentration in banks (Wagner, 2010).

Furthermore, the importance of loan concentration is especially noticeable in the context of developing economies like Nepal. Shrestha (2014) studied commercial banks in Nepal and discovered that over-concentration in some industries, such real estate and hydropower, made those industries more vulnerable to downturns in the economy. In order to lower risk and increase bank profitability in these kinds of economies, Shrestha's research emphasized the significance of strategic diversification (Shrestha, 2014).

Essentially, the Credit Concentration Theory emphasizes a basic risk management principle: diversification is essential to reducing possible losses. A bank's portfolio is more susceptible to shocks peculiar to its industry when credit exposures are concentrated, which raises the possibility of serious financial difficulty. The idea has developed to highlight the crucial necessity for banks to manage their exposure levels responsibly in order to protect their profitability and stability through the works of Vasicek, Elizalde and Repullo, Wagner, and others.

2.1.2 Portfolio Theory

A key idea in finance, portfolio theory, commonly referred to as modern portfolio theory (MPT), deals with how investment portfolios should balance risk and return. Harry Markowitz's theory, which was developed in the early 1950s and introduced the idea of diversity to limit risk while increasing returns, completely changed the way investors handled asset allocation.

The groundwork for Portfolio Theory was established by Markowitz's seminal work, "Portfolio Selection," which appeared in 1952. In this study, Markowitz claimed that diversification—holding a variety of assets that are not perfectly connected with each other—could minimize the overall risk of an investment portfolio. He maintained that investors might reduce the total risk of the portfolio without necessarily

compromising projected returns by carefully choosing assets whose returns do not fluctuate in tandem (Markowitz, 1952).

The mean-variance optimization framework, which is the fundamental concept of portfolio theory, selects assets according to their expected returns (mean) and variability (variance). This theory states that any feasible asset portfolio may be represented on a graph where the y-axis represents the expected return and the x-axis represents the risk (as determined by standard deviation). This graph creates what is referred to as the "efficient frontier," which shows the collection of portfolios that offer the maximum predicted return for a particular risk level. To get the best returns given their risk tolerance, investors should build portfolios that are situated along this frontier (Markowitz, 1959).

In 1958, James Tobin expanded on Markowitz's work by proposing the "separation theorem," which holds that decisions about investments can be divided into two distinct categories: selecting the riskiest portfolio that is optimally risky (located on the efficient frontier) and selecting a risk-free asset to combine with the risky portfolio, like Treasury bills. This enables investors to combine risky assets with risk-free assets to customize their portfolios to their unique risk preferences (Tobin, 1958).

Portfolio Theory offers a solid foundation for comprehending how banks might manage their loan portfolios to balance risk and profitability in the context of banking and credit concentration. Similar to private investors, banks must optimize their asset allocations to minimize risk and increase returns. Banks can lessen the impact of unfavorable occurrences in any one industry or location by spreading their loan portfolios over a range of borrower types and sectors. This will stabilize their income streams and increase profitability.

For example, Chiorazzo, Milani, and Salvini (2008) examined how Italian banks diversified their loan portfolios across several economic sectors using Portfolio Theory. According to Chiorazzo, Milani, and Salvini (2008), they discovered that banks with more diverse portfolios showed lower risk and higher returns. This proved the usefulness of portfolio theory in the banking industry.

The application of Portfolio Theory to financial institutions, specifically in the area of credit risk management, was further examined by Jorion (2001). He underlined that when banks' lending is biased toward particular industries, diversification is essential

to lowering the concentration risk that these institutions confront. According to Jorion's research, a bank's ability to withstand economic shocks and maintain profitability can both be improved by applying Portfolio Theory concepts effectively (Jorion, 2001).

Furthermore, Andersen and Nielsen (2013) talked about how banks could use Portfolio Theory to create loan portfolios that optimize returns for a certain amount of risk. In order to properly manage their credit risk through diversification, they stressed that banks must evaluate the correlations between various loan kinds and economic sectors (Andersen & Nielsen, 2013).

2.1.3 Sectoral Allocation of Credit Theory

The distribution of a bank's lending across different economic sectors, including manufacturing, services, real estate, and agriculture, is known as sectoral allocation of credit. This idea looks at how banks choose which industries to lend to, what influences those choices, and how those choices affect the risk profile and profitability of the bank. According to the theory, strategic allocation can improve a bank's stability and performance by maximizing the ratio of return to risk across all sectors.

Economic and financial theories that examine how resources are distributed within an economy form the core of Sectoral Allocation of Credit. Hyman Minsky is credited as one of the pioneers in the knowledge of sectoral credit distribution. Minsky (1986) highlighted in his work on financial instability the significance of comprehending how sectoral economic conditions impact banks' lending decisions and the possibility that these decisions could either stabilize or destabilize the economy. According to Minsky's observations, banks may overlend credit to quickly expanding industries during economic booms, which can result in bubbles and ensuing crises when these industries experience downturns (Minsky, 1986).

Boyd and Prescott (1986) expanded on Minsky's research by investigating how banks, acting as financial intermediaries, choose which industries to lend to according to projected returns and risks. Their study in "Financial Intermediary-Coalitions" explores how banks manage sectoral allocations to maximize their overall performance and pool risks across different sectors. They noted that in order for banks

to effectively manage risks and maintain profitability under a range of economic scenarios, sectoral diversification is essential (Boyd & Prescott, 1986).

In actuality, a number of factors affect how banks distribute loans to various sectors:

Prospects for Sectoral development: Banks typically lend more to industries with strong development potential. For example, banks may lend more to the technology industry during a boom in order to profit from its explosive growth. According to the "Pecking Order Theory" proposed by Myers and Majluf (1984), firms with better growth prospects have a higher chance of obtaining funding, especially from banks, because banks view them as having a lower risk and a larger potential for profits.

Risk and Default Rates: Due to their higher probability of experiencing financial trouble, industries with higher default risks or return volatility may be denied credit. In their work on credit risk management, Altman and Saunders (1998) observed that during economic downturns, banks tend to restrict credit allocations to sectors like real estate that have a history of higher default rates in an effort to minimize prospective losses.

Regulatory and Policy Influences: Banks may be directed toward or away from specific industries by government policies and regulations. To encourage inclusive economic growth, central banks in many nations, for instance, may require or provide incentives for lending to priority industries like agriculture or small and medium-sized businesses (SMEs). The study conducted by Kashyap, Rajan, and Stein (2002) investigated the impact of regulatory frameworks and monetary policy on the lending practices of banks in different industries. The findings of the study indicated that regulatory limitations had a substantial influence on the distribution of credit across sectors.

Economic Cycles and Sectoral Performance: In reaction to economic cycles, banks modify the distribution of their sectoral credit. Banks may lend more to cyclically sensitive industries like real estate and construction during economic booms, while they may move toward more stable industries like utilities or consumer staples during downturns. In their work, Gertler and Kiyotaki (2010) examined how banks' lending practices are influenced by various sector health and economic swings, especially during periods of economic hardship.

Sharma and Ghimire (2016) investigated the effects of sectoral credit allocation on the performance and stability of Nepalese commercial banks. They discovered that banks tend to be more resilient and stable, particularly during economic downturns, when their lending portfolios are more diversified across several sectors. In developing nations like Nepal, their research demonstrated the vital role that strategic sectoral allocation plays in controlling credit risk and boosting bank profitability (Sharma & Ghimire, 2016).

In a similar vein, Ali, Akhtar, and Sadaqat (2011) looked into how sectoral credit allocation affected Pakistani banks' profitability. Based on their analysis, they found that banks may greatly increase their profitability by carefully allocating lending to low-risk, high-growth sectors. (Ali, Akhtar & Sadaqat, 2011) emphasized the significance of matching sectoral lending strategies with sectoral performance metrics and macroeconomic conditions.

2.1.4 Credit Risk Management Theory

An essential component of banking and other financial organizations is credit risk management, which focuses on the methods and procedures used to reduce the possibility of losses from borrowers' refusal or incapacity to repay loans. This idea includes a broad range of procedures designed to detect, quantify, track, and manage credit risk in order to protect a financial institution's stability and profitability.

Credit risk management has strong theoretical roots in both financial theory and real-world banking practices. Robert C. Merton has made a significant contribution to our understanding of credit risk. The credit risk of corporate debt was evaluated using a model that Merton presented in his 1974 work, "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates," which used option pricing theory. This model, also known as the Merton Model, provides a framework for assessing the probability of default based on the firm's asset value and debt structure by treating a company's equity as a call option on its assets (Merton, 1974).

Altman and Saunders (1998) expanded on Merton's research by offering a thorough analysis of credit risk measurement methods and how they have changed over the years. They emphasized the significance of evaluating credit risk using a variety of models, such as loss given default (LGD) measures, credit rating systems, and default probability estimation. With the aid of these instruments, banks are able to assess the

possible risk involved in making loans to various borrowers and industries, facilitating better decision-making (Altman & Saunders, 1998).

Identification of Credit Risk: This process include identifying possible credit risks connected to both new and current borrowers. In their study, Schreiner and Yaron (2001) examined how microfinance organizations determine and evaluate credit risks, paying particular attention to borrower attributes and outside variables that may affect the borrower's capacity to repay the loan.

Credit Risk Measurement: To estimate credit risk, banks employ a range of models and measures. Methods including stress testing, internal ratings-based (IRB) techniques, and credit scoring are used to quantify the likelihood of default and possible losses. Under the Basel II framework, the Basel Committee on Banking Supervision (2000) established standards for quantifying and managing credit risk, which included the application of advanced and standardized IRB techniques (Basel Committee, 2000).

Credit Risk Monitoring: To spot early indicators of credit degradation, credit risk monitoring continuously follows loan and borrower performance. Carey (2001) stressed the significance of dynamic credit risk monitoring systems that adjust to shifting borrower behaviors and market conditions.

Implementing policies and procedures to reduce exposure to high-risk borrowers and industries is known as credit risk control. Commonly employed strategies include credit limit setting, collateral requirements, and portfolio diversification. The importance of credit risk control in controlling the exposure to and concentration of hazards in a bank's loan portfolio was emphasized by Crouhy, Galai, and Mark (2000).

2.2 Empirical Review

Anjani et al. (2010) looked at the flow of agricultural credit performance and determined what factors led to more Indian farm households using institutional loan more frequently. The institutional credit to agriculture has grown significantly over the past forty years, according to a study based on secondary data gathered from multiple sources. The composition of lending outlets has changed dramatically in recent years, with commercial banks emerging as the primary provider of institutional loans. However, the sustainable growth of agriculture may be hampered by the

investment credit's diminishing proportion in the total credit. The amount of institutional credit that farming households take out depends on a variety of sociodemographic parameters, such as household occupation, caste, education level, size of farm, and family size. To select between the fixed effect model and the random effect model, the redundant fixed effects test is used. Given that the computed p values for the Chi-square and F-tests are both smaller than 0.05 (0.0000), it can be inferred that the fixed effect model performs better than the random effect model. The fixed effect model permits the seven banks to be heterogeneous or unique by granting each bank a unique intercept value.

The report recommended streamlining the process to improve smallholders' and farmers' with lower levels of education or illiteracy's access to agricultural loans.

Afroz (2013) investigated and calculated Bangladesh Krishi Bank's credit portfolio management requirements. Any banking institution's portfolio management process includes both asset and liability management. The core of portfolio management in a bank is determining the most effective way to estimate the needs for deposits and loans. A variety of factors are taken into account when managing a bank's portfolio in Bangladesh; however, the implementation of financial sector reform measures recently has added dynamism and made credit diversification a need in bank portfolio management. This essay aims to outline Bangladesh Krishi Bank's current credit portfolio management procedure and offer some solutions to potential credit portfolio management-related issues.

In their 2017 study, Daoud and Kammoun examined the Tunisian Islamic banking industry's financial results from 2010 to 2014. In Tunisia, Islamic banking is relatively recent compared to traditional banking. According to the examination of the literature, this study is the first to focus on Islamic banking in Tunisia. Thus, an analysis of the financial standing of the two Islamic banks in Tunisia has been conducted in order to provide stakeholders with a thorough understanding of Islamic banks. The most important financial statistics and analysis are used to assess each bank's performance estimate in terms of profitability, liquidity, risk, and solvency. The general stability of every bank is evaluated by the study as well. The performance was classified using the descriptive statistical measures of mean, standard deviation, and coefficient of variation, which measure the variability and dispersion of these ratios. The outcome shows that over the examined time, both banks maintained a strong financial

performance position in the banking sector. In contrast, Baraka Bank's profitability and risk management are marginally higher than ZBL Bank's. Both Islamic banks are generally financially sound, however in terms of stability, Al Baraka Bank is in a better position than ZBL Bank.

The evidence of credit portfolio management and its connection to bank financial performance were investigated by Gauchan and Upadhyaya (2019). Seven joint venture commercial banks' monthly financial reports were analyzed by contrasting the bank's loan portfolio management by sector and its connection to return on assets. Regression with both fixed and descriptive effects was utilized to examine the panel data. It demonstrates that, with the exception of consumption and other areas, every industry affects banks' financial performance.

Between 2015 and 2019, Akber and Dey (2020) conducted an analysis and evaluation of the performance of Islamic banks and traditional private commercial banks in Bangladesh. The CAMEL test served as the foundation for the analysis in this work. Every pertinent piece of information was gathered from the bank's websites. This article used a sample of five Islamic banks and five traditional private commercial banks to measure and compare the performance. It took each year's average ratio into account. The performance of private commercial banks, both Islamic and conventional, has been analyzed using a common test framework called the CAMELS tests. T-tests have been utilized in this paper to support the data's dependability. According to the paper's findings, there is no discernible difference in the performance of Islamic banks and traditional private commercial banks in Bangladesh using the CAMEL test, with the exception of managerial quality. Islamic banks outperform traditional private commercial banks in Bangladesh in terms of capital adequacy and liquidity position, while traditional private commercial banks perform better when it comes to management quality and asset quality.

Yusuf and Ichsan (2021) examine the impact of NPF, FDR, BOPO, and CAR financial performance of Sharia Commercial Banks in the Period 2011-2020 in order to ascertain sharia banking performance following the merging of Sharia Banks and the Covid 19 epidemic. The population of this study, which employs a quantitative research methodology, consists of all Indonesian commercial banks operating under sharia from 2011 to 2020. The library technique is used to gather data from journals, articles, and other books that are relevant to the required data. Data from the OJK

website and the documentation method of the relevant sharia commercial bank implementation report are also used. A statistical descriptive test, a classic assumption test, some regression testing, and a descriptive test utilizing content analysis of the ROA implementation report are the research methods employed. The variables NPF, FDR, BOPO, and CAR are indicative of the financial performance of Indonesian Sharia Commercial Banks from 2011 to 2020, according to the results. The NPF, FDR, BOPO, and CAR factors all significantly affect the financial performance (ROA) of Indonesia's sharia commercial banks from 2011 to 2020. According to the amount adjusted R2, which is 0.979, independent variables account for 97.9% of the financial performance (ROA) of sharia commercial banks, with the remaining 02.1% being influenced by factors not included in the study. Between 2011 and 2020, cars have a negligible positive impact on Indonesia's sharia commercial banks' profitability (ROA). NPF has a negligible positive impact on Indonesian sharia commercial banks' financial performance (ROA) from 2011 to 2020. Between 2011 and 2020, the financial performance (ROA) of Indonesia's sharia commercial banks is significantly impacted negatively by BOPO. FDR has a negligible positive impact on Indonesia's sharia commercial banks' financial performance (ROA) from 2011 to 2020.

Gazi et al. (2022) used the established CAMELS rating system to determine the position based on each individual's financial performance both prior to and throughout the COVID-19 period. Following an evaluation of the situation, the fixed-effect regression model is employed to investigate the effects of the bank's unique factors, macroeconomic variables, and other variables on the profitability of the bank. The banks with superior pre-pandemic performance during COVID-19 also demonstrated superior pandemic performance. During both eras, AIBL, EBL, and BBL performed nearly independently better. Regarding bank profitability, our article found that high rates of non-performing loans, retaining more liquid assets, having a large amount of capital set aside for hedging, and having an inappropriately small bank all reduced the profitability of the banks during the COVID-19 epidemic. By contrast, the bank's profits during this period was boosted by a low inflation rate and leverage situation. The study's findings will assist bank regulators in identifying weak points and implementing preventative actions that will increase banks' profitability during a crisis like COVID-19. The portfolios of depositors and investors in banks are precisely customizable.

In Kithandi's analysis from 2022, the impact of reserve ratio requirements, repo rates, and changes in central bank rates on the financial performance of Kenyan commercial banks were examined. The study was conducted between 2016 and 2020, spanning a five-year period. The cash reserve ratio, the repo rate, and the central bank rate were the study's independent variables. The dependent variable was return on equity. A descriptive longitudinal research design was adopted in the study. The forty-two commercial banks that hold operating licenses from the Central Bank of Kenya comprised the entire population. The study used a variety of research tests; the normalcy test, quantile-quantile plot, and Durbin-Watson tests were used to analyze the research findings. The study discovered a negative correlation between Kenyan commercial banks' return on equity (financial performance) and the Central Bank rate as well as the demand for a cash reserve ratio. The study's conclusions also demonstrated a favorable correlation between Kenya's commercial banks' return on equity (or financial performance) and their repo rate. The study's conclusion was that Kenya's commercial banks' financial performance and profitability are impacted by monetary policy. The study suggests that the central bank should monitor and maintain a low central bank rate in order to boost economic growth.

2.3 Research Gap

Given the crucial role that sectoral lending plays in determining the financial health and strategic orientation of banks in rising economies like Nepal, the sector-wise credit concentration of Nepalese commercial banks and its effect on profitability are becoming more and more important. Despite its significance, there are a number of important gaps in the study that has been done so far. First and foremost, there is a dearth of comprehensive research on the ways in which particular sectoral allocations—such as loans to manufacturing, commerce, agriculture, and consumption—differentially impact Nepalese banks' profitability, which is frequently gauged by Return on Assets (ROA) (Sharma & Ghimire, 2016). Every industry has a different risk and return profile. For instance, lending to the agricultural sector is more vulnerable to weather variations and changes in market prices, which can have a special effect on profitability when contrasted with the more stable industries of manufacturing or trade. Furthermore, a lot of research has been done that ignores the simultaneous impact of important factors like bank size and the capital adequacy ratio (CAR). These variables are critical for a thorough understanding since they have a

direct impact on the operational dynamics and risk-bearing capacity of banks, which can modify the effect of sectoral lending concentration on profitability (Poudel, 2012; Sufi & Qureshi, 2020).

Furthermore, studies that take into consideration Nepal's changing economic circumstances are required. Frequent fluctuations and regulatory changes are features of the Nepalese economy that can have a substantial impact on the long-term effects of sectoral lending concentration on bank profitability. There are few longitudinal research that adequately capture these changing conditions (Nepal Rastra Bank, 2020). Moreover, there may be notable variations in the effects of sectoral credit concentration between big and small banks. Larger banks may be better equipped to reduce the risks connected with concentrated lending since they usually have more diverse portfolios and strong risk management procedures (Koch & MacDonald, 2009). Nevertheless, there aren't many thorough comparison studies that examine these variations among different bank sizes. Finally, a significant portion of the literature currently available on sectoral credit concentration tends to concentrate on established economies, giving emerging nations like Nepal, whose banking sector dynamics and economic circumstances differ significantly, comparatively less attention (Ali, Akhtar & Sadaqat, 2011). In-depth empirical research that incorporates sector-specific credit data, takes into account the moderating impacts of CAR and bank size, and takes into account Nepal's distinct and evolving economic environment is needed to close these gaps.

CHAPTER- III

RESEARCH METHODOLOGY

The research strategy, data type and sources, data collection process, sampling, sample characteristics, instrument creation, and tools and analysis techniques are all covered in this chapter.

3.1 Research Design

Descriptive and informal comparative research designs were used in this study. The purpose of this study is to evaluate the degree of credit concentration linked to the bank's credit portfolio and ascertain whether the banks have implemented safe and sound policies that are suitable for their size, type, and scope in relation to NRB. Put another way, it makes an effort to fit the categorized loan within the NRB rules and examine the relationship between credit concentration and profitability. Thus, it is necessary to assess a large amount of secondary data that has been released. As a result, analytical and descriptive study designs are suitable.

3.2 Population and Sample

The study's population consists of all commercial banks that are active in Nepal. There will be twenty commercial banks in 2024. Therefore, the study's population consists of all 20 commercial banks. This study is a census. Thus, population research is the focus of this project. Based on their return on assets and credit concentration, three commercial banks are selected. Correlation analysis is used to evaluate the overall analysis of three commercial banks with the respective bank's ROA and net interest income statistics.

3.3 Nature and Sources of Data

To receive information in the desired manner, data are gathered from pertinent bank websites, NRB statistics reports, and NRB rules. The following is a description of the statistical tools used:

3.4 Data Processing Procedure

Prior to data analysis, the information must be presented methodically in the forms of tables, graphs, and charts, which provide a wealth of context for the data and

information gathered. Table presentation is most often used to display huge data in a format that is comparable. A trend line is used in a line diagram to display the data.

3.5 Research framework

A condensed conceptual framework that postulates the connection between profitability and its factors is presented in this section. The financial ratio approach is typically used to evaluate a company's performance since it gives a clear picture of the company's profitability in relation to prior periods and aids in enhancing managerial performance. Return on assets (ROA), a measure of the profitability of Nepalese commercial banks, was employed in this study as the dependent variable. The purpose of this research is to determine how bank-specific factors affect Nepalese commercial banks' profitability. As a result, the capital adequacy ratio, bank size, credit on agriculture, credit on manufacturing, credit on consumption, and credit on commerce were all measured as bank-specific explanatory variables in this study.

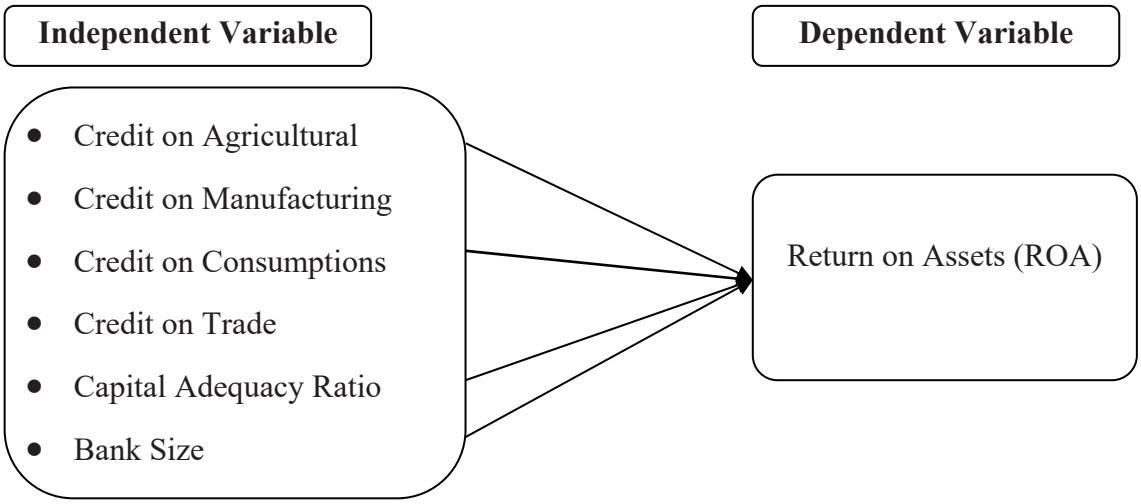

Figure 1. Research framework

Source: Gauchan and Upadhyaya (2019)

Definition of Variable

Return on Assets

Return on assets (ROA) has been employed in this study as a stand-in for the financial performance of Nepali commercial banks. ROA is a commonly utilized metric to assess the financial performance of businesses since it serves as an indicator of profitability. It merely contrasts the company's profit with its total assets. Return on assets, then, demonstrates how well a company uses its resources to produce revenue.

Put differently, it demonstrates how effectively management uses organizational assets to generate revenue (Nassreddine et al., 2013).

Credit on Agricultural

Financial assistance given to farmers and agricultural enterprises is known as agricultural credit. It supports their land, equipment, and input purchases, enabling expansion and smooth operations. Banks, government initiatives, and microfinance organizations are examples of sources. Although some programs offer alternatives, collateral is frequently required. Subsidies are frequently used to lower interest rates and make borrowing more accessible. Accessibility issues and excessive debt are problems. According to Gauchan and Upadhyaya (2019), digitalization is driving financial inclusion, increasing access, and accelerating rural development.

Credit on Manufacturing

In the manufacturing industry, credit is the term used to describe the funding that businesses receive to support their operations, growth, and personnel, technology, and machinery investments. The expansion and competitiveness of the manufacturing industry depend heavily on this type of finance. Funding is frequently needed by manufacturing businesses in order to buy raw materials, replace outdated machinery, recruit qualified workers, and improve their workflows. International financial institutions, commercial banks, government initiatives, and individual investors are some of the sources from which this credit may be obtained. Different terms, interest rates, and collateral requirements may affect a manufacturer's ability to obtain financing. In many nations, the availability of reasonably priced manufacturing financing is a major factor in promoting industrial development, job creation, and economic progress (Gauchan & Upadhyaya, 2019).

Credit on Consumptions

Loans and credit given to people for personal expenses, such as purchasing items, paying for medical expenses, or financing schooling, are referred to as consumer credit. Credit cards, auto loans, and personal loans are among the types. Creditworthiness is one of the elements that determine interest rates and repayment terms. While prudent utilization can aid in cost management, excessive debt can cause serious financial difficulties. Laws protecting consumers are in place to guarantee

ethical loan activities. Technology has increased accessibility to online and mobile credit. People must use consumer credit responsibly (Gauchan & Upadhyaya, 2019).

Credit on Trade

A variety of financial services provided by banks to support international trade transactions are together referred to as bank credit on trade. These services—which include trade finance, export/import financing, and Letters of Credit (LCs)—offer crucial assistance to companies that conduct cross-border business. LCs provide security by ensuring that sellers will be paid after fulfilling predetermined requirements, whereas trade finance options take care of financing requirements both before and after shipping. Banks also offer export credit insurance to reduce the risk of buyer default and help manage currency risk through foreign exchange services. In general, bank lending for trade is essential for fostering international trade because it lowers financial uncertainty and makes it possible for businesses to take advantage of possibilities in the global economy (Gauchan & Upadhyaya, 2019).

Capital adequacy ratio

The ratio of a bank's risk-weighted credit exposures to its available capital fund is known as its CAR. The Basel Accord's need for adequate capital safeguards depositors and advances the stability and effectiveness of the fiscal system. Greater capital adequacy ratios indicate that a bank is secure and robust enough to meet its financial obligations (Kithandi, 2022).

Bank size

Bank size is an important indicator of a bank's financial power and influence. It is normally calculated using the total assets held by the bank. Greater ability to handle transactions, control risks, and offer a wider range of financial services are usually associated with larger banks. Factors like as customer deposits, loan portfolios, investments, and other assets are responsible for its size. Because a bank's size might indicate its stability and effect on the financial system, investors and regulators frequently keep a close eye on it (Gurung & Gurung, 2022).

3.6 Methods of Analysis

Statistics can be used to measure the relationship between two or more variables. The following statistical tools were employed in this investigation.

1. Descriptive Statistics

Mean

The mean is the total number of observations divided by the total number of observations. In these situations, every component is equally significant.

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

Where,

$\sum X$ = the sum of observations

N = No. of observations

Standard Deviation (S.D.):

The positive root of the mean of the square deviations from the mean of a set of values is known as the standard deviation. Another name for it is the Root Mean Square Deviation. Often, the Greek letter "σ" (Small Sigma) is used to symbolize it.

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

2. Correlation analysis:

The covariance of the two variables divided by the product of their standard deviations yields the Pearson's correlation coefficient. The interval of the correlation coefficient is −1 to 1. When X and Y have a linear equation with a value of 1, all the data points fall on a line where Y rises as X increases, completely describing the relationship between the two variables. When Y drops as X grows, a line with all the data points falling on it is shown by a value of −1. There isn't a linear association between the variables if the value is 0.

$$r = r_{xy} = \frac{n\sum X_i Y_i - \sum X_i \sum Y_i}{\sqrt{n\sum X_i^2 - (\sum X_i)^2}\sqrt{n\sum Y_i^2 - (\sum Y_i)^2}}$$

Where, r_{xy} = correlation between X andY

X, Y = Two variables under study

3. Regression Analysis

Only the presence or absence of a strong relationship between two variables may be determined by a correlation study. However, even if a correlation coefficient shows

that two variables have a strong association, it is impossible to pinpoint the precise nature of that relationship. Regression analysis in this instance offers more details regarding the relationship's slope. It is employed to forecast and characterize the nature of a connection. This section ascertains which independent variable best accounts for result variability as well as the relative significance of dependent variable variability in relation to other variables.

To determine the link between the independent and dependent variables, linear regression analysis was used. One benefit of using linear regression analysis was being able to assess several independent factors that influence the dependent variables at the same time. This is the equation that represents the impact of independent variables:

$ROA = \beta_0 + \beta_1 FS + \beta_2 FA + \beta_3 FE + \beta_4 FA + \beta_5 FE + \beta_6 FE + €$ ..... (i)

Where,

β_0=Constant/ Y-intercept

$\beta_1 – \beta_6$= Regression coefficients of independent variables

CA = Credit on Agriculture

CM = Credit on Manufacturing

CC = Credit on Consumption

CT = Credit on Trade

CAR = Capital Adequacy Ratio

BS = Bank Size

€= standard error term

Meta Analysis Table

Name (Year)	Title	Objectives	Methodology	Findings
Anjani Kumar, K. M. Singhb and Shradhajali Sinhac (2010)	Institutional Credit to the Indian Agriculture Sector: Context, Outcomes, and Influencers	The current study looked at how well agricultural credit flow performed and determined what factors led to more Indian farm households using institutional loans more frequently.	The institutional credit to agriculture has grown significantly over the past forty years, according to a study based on secondary data gathered from multiple sources.	To select between the fixed effect model and the random effect model, the redundant fixed effects test is used. Given that the computed p values for the Chi-square and F-tests are both smaller than 0.05 (0.0000), it can be inferred that the fixed effect model performs better than the random effect model. The fixed effect model permits the seven banks to be heterogeneous or unique by granting each bank a unique intercept value.
Nushrat Nahida Afroz (2013)	Credit Portfolio Management of	This article is an attempt to describe the present credit	This study is basically descriptive in nature and	Commercial activities like letter of credit (LC) business, purchase

	Bangladesh Krishi Bank	portfolio management practice of Bangladesh Krishi Bank. Variables: credit portfolio management, deregulation, globalization, Bangladesh Krishi bank.	mainly based on secondary information. This study analyses published books, different published research work, newspapers, different government officials, various reports and websites. Different officials of Bangladesh Krishi Bank were interviewed to obtain relevant data.	and sale of foreign currencies and other international business is very negligible at BKB, out 836 no. of branches only 10 no. of branches are involved with foreign exchange business, which is only 1.2% of total branches. This business need be expanded.
Grzegorz Michalski (2017)	Portfolio Management Approach in Trade Credit Decision Making	The objective of this study was to analyze the portfolio management approach in trade credit decision making.	The present article offers a method that uses portfolio management theory to determine the level of accounts receivable in a firm. Variables: accounts receivable, trade credit	The findings shows that firm managers noticed that the expected profits were higher and correlated negatively with profits generated from purchases by current customers. This was certainly from allowing trade credit

			management, incremental analysis, value based management, portfolio analysis	to customers who had made cash purchases because of the high risk during the receivables collection period. These trends lead to the expectation1 of a lower risk of profits from accounts receivable and growth in profits from sales in general at the same time. A 3% cash discount was proposed for customers who paid within 10 days along with an extension of the payment deadline to 45 days for any remaining customers.
Suvita Jha and Xiaofeng Hui (2017)	A comparison of financial performance of commerc	The objective of this study was to compare the financial performance of different ownership	Eighteen commercials banks for the period 2005 to 2010 were financially analyzed. In	The results show that public sector banks are significantly less efficient than their counterpart are; however domestic private banks are

	ial banks: A case study of Nepal.	structured commercial banks in Nepal based on their financial characteristics and identify the determinants of performance exposed by the financial ratios.	addition, econometric model (Multivariate regression analysis) by formulating two regression models was used to estimate the impact of capital adequacy ratio, non-performing loan ratio, interest expenses to total loan, net interest margin ratio and credit to deposit ratio on the financial profitability namely return on assets and return on equity of these banks.	equally efficient to foreign-owned (joint venture) banks. The R square for ROA (0.621) was determined higher than ROE (0.443), influence ROA better than ROE. In ROA model, the result shows that capital adequacy ratio, interest expenses to total loans, net interest margin significant while non-performing loan ratio and credit to deposit ratio were not significant.
Ashish Gauchan, Prof. Tara Prasad Upadhyaya	Credit Portfolio Management and Profitability of Joint	The paper shows the evidence of credit portfolio management and its relationship with banks' financial	Descriptive and fixed effect regression was used to analyze the panel data. Dependent variable: Loan	Redundant Fixed Effects test is carried out to choose between fixed effect model and random effect model. Since both the calculated p

(2019)	Venture Commercial Banks of Nepal	performance.	Amount of Agriculture & Energy Sector, Loan Amount of Manufacturing & Mining Sector, Loan Amount of Service Sector, Loan Amount of Trade & Retailer Sector, Loan Amount of Consumption and Dependent variable: Return on Assets	value of F-test and Chi-square test is 0.0000 which is less than 0.05, it implies that a fixed effect model is a better model compared to the random effect model. The fixed effect model allows for heterogeneity or individuality among 7 banks by allowing each of the bank to have their own intercept value.
Wolfgang Hammes and Mark Shapiro (2021)	The implications of the new capital adequacy rules for portfolio management of credit assets.	The objective of the study is implications of the new capital adequacy rules for portfolio management of credit assets.	These are: structural changes in the credit markets, influences of risk transfer in lending markets, ballooning debt levels in the US, and the proposed changes for capital adequacy.	As a result, banks' lending portfolios often show a high concentration of domestic/regional risk. Mc-Kinsey analysis, however, shows that domestic credit risk is often highly correlated, even across different businesses, providing little diversification benefits

				for banks in domestic credit markets.
Tobias Olweny and Themba Mamba Shipho (2021)	Effects of Banking Sectoral Factors on The Profitability of Commercial Banks In Kenya.	The objective of this study was to determine and evaluate the effects of bank-specific factors; Capital adequacy, Asset quality, liquidity, operational cost efficiency and income diversification on the profitability of commercial banks in Kenya.	This study adopted an explanatory approach by using panel data research design to fulfill the above objectives. Annual financial statements of 38 Kenyan commercial banks from 2002 to 2008. The data was analyzed using multiple linear regressions method.	The analysis showed that all the bank specific factors had a statistically significant impact on profitability, while none of the market factors had a significant impact. Based on the findings the study recommends policies that would encourage revenue diversification, reduce operational costs, minimize credit risk and encourage banks to minimize their liquidity holdings. The results for CIR are as follows; in the main sample the impact is -0.068(-16.972), in the sample of large banks is -0.075 (-10.14) and in the sample of small and medium banks the

				impact is -0.063 (-10.348).
Mohammad Yusuf1 and Reza Nurul Ichsan (2021)	Analysis of banking performance in the aftermath of the merger of bank syariah indonesia in Covid 19	This study aims to determine sharia banking performance after the merger of Sharia Banks and Covid 19 pendemi by looking at the influence of NPF, FDR, BOPO, and CAR financial performance.	The research method used is a statistical descriptive test, descriptive test by analyzing ROA through ROA implementation report using content analysis method, classic assumption test, some regression test.	Results show that the variables NPF, FDR, BOPO, and CAR are simultaneously financial performance. Simultaneously, the variables of NPF, FDR, BOPO and CAR have a significant impact on the financial performance (ROA). Based on the amount adjusted R2 is 0.979 which means that 97.9% of financial performance (ROA) of sharia commercial banks is influenced by independent variables.
Md. Abu Issa Gazi , Md. Nahiduzzaman , Iman Harymawan , Abdullah Al Masud	Impact of COVID-19 on Financial Performance and Profitability of	In this study, we investigate the impact of COVID-19 on the financial performance and profitability of the listed private	The standardized CAMELS rating system. After assessing the position, the fixed-effect regression model is used. Variables:	This paper discovered that during the pandemic period of COVID-19, high non-performing loan rates, holding more liquid assets, a high amount of

and Bablu Kumar Dhar (2022)	Banking Sector in Special Reference to Private Commercial Banks: Empirical Evidence from Bangladesh	commercial banks in Bangladesh.	financial performance index; CAMELS; profitability; macroeconomic variables.	hedging capital, and inappropriate bank size lessened the banks' profitability. In contrast, a low leverage position and inflation rate enhanced the bank's profitability during this period.
Jas Bahadur Gurung and Nirmal Gurun (2022)	Factors Determining Profitability of Commercial Banks: Evidence from Nepali Banking Sector	A set of balanced panel data containing 13 Nepali commercial banks for 12-year period (2009-2020) with 156 observations was employed for analysis. Descriptive statistics and Pearson's correlation analysis were employed to measure the status and explore	Descriptive statistics and Pearson's correlation analysis were employed to measure the status and explore the relationship between independent and dependent variables under study. The study findings were drawn using fixed-effect panel regressions.	The study revealed that loan to deposit, known as credit-deposit ratio, has a significant positive impact on the return on assets and net interest margin of commercial banks.

		the relationship between independent and dependent variables under study.		
Shawuya Jigeer and Ekaterina Koroleva (2023)	The Determinants of Profitability in the City Commercial Banks: Case of China.	This study investigates how internal and external factors affect the profitability of city commercial banks in China.	This study uses a panel data regression model. The pooled OLS model is used. Variables: profitability; capital adequacy; credit quality; operating efficiency; liquidity	The results show that internal explanatory variables such as bank size, capital adequacy, credit quality, and operating efficiency and external explanatory variables such as province GDP and inflation have a significant impact on the profitability of city commercial banks, while liquidity has no significant effect on the bank's Profitability.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter has presents the data on table. The main objective of the study is to present data and analyze them with the help of various financial and statistical tools. This chapter consists of analysis and presentation of empirical data. The important variables are very sensitive and taken into consideration, so this chapter has presents the analysis of components of credit risk and its effect on financial performance. With the help of analysis of sector wise credit concentration of commercial banks and its impact on profitability has been analyzed and interpreted.

So that the strength and weakness, historical performance and present financial condition of the sample banks has determined by this analysis. The financial tools included graphical presentation as well as correlation and regression analysis between variables. The major variables like credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio, bank size and ROA are taken for the analysis. Moreover, the variables affecting to the financial performance is also considered in the study. The analysis is made through the data presentations and various financial tools reflecting the relationship among variables affecting financial performance.

4.1 Descriptive Statistics

The descriptive statistics used in this study consists of minimum, maximum, mean and the standard deviation associated with variables under consideration. Therefore, descriptive statistics enables to present the data in a more meaningful way, which allows simpler interpretation of the data.

The descriptive statistics of dependent variables (return on assets) and independent variables (credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio, bank size.) for selected Nepalese commercial banks is presented in Tables.

4.1.1 Situation of Credit on Agricultural

Credit on agriculture in commercial banks refers to the financial services provided by these institutions to support farming and related activities. This includes loans and credit facilities designed to meet the needs of farmers for purchasing equipment,

seeds, fertilizers, and other inputs necessary for agricultural production. By offering such credit, commercial banks help boost agricultural productivity, support rural economies, and ensure food security. These loans can be short-term, medium-term, or long-term, depending on the specific requirements of the agricultural activities and the repayment capacity of the borrowers.

Table 1

Credit on Agricultural

Year	EBL	NABIL	NIMB
2013/14	6,520,363,288.00	6,656,026,492.33	6,515,359,789.00
2014/15	8,164,247,785.00	7,967,761,863.33	8,066,012,962.00
2015/16	10,208,132,282.00	9,446,163,901.00	9,616,666,135.00
2016/17	11,252,016,779.00	10,257,899,272.00	11,167,319,308.00
2017/18	12,295,901,276.00	12,069,634,643.00	12,717,972,481.00
2018/19	15,339,785,773.00	15,881,370,014.00	14,268,625,654.00
2019/20	20,745,661,762.00	19,693,105,385.00	21,819,278,827.00
2020/21	27,108,550,513.00	30,274,725,752.00	32,441,966,009.00
2021/22	28,558,254,647.00	36,787,590,227.00	41,591,757,391.00
2022/23	37,871,135,834.00	58,459,810,327.00	48,310,768,916.00
Mean	17,806,404,993.90	20,749,408,787.67	20,651,572,747.20
S.D	10,386,178,764.57	16,566,399,758.07	14,972,316,907.85
C.V	0.58	0.80	0.72

Table 1 presents agricultural credit disbursed by three banks EBL, NABIL, and NIMB over a decade from 2013/14 to 2022/23. The table also includes statistical measures such as the mean, standard deviation (S.D), and coefficient of variation (C.V),

offering insights into the consistency and variability of the credit amounts over the years.

Starting with the year 2013/14, EBL extended a credit of 6,520,363,288.00 NPR, which gradually increased to 37,871,135,834.00 NPR by 2022/23. This indicates a substantial growth in EBL's agricultural credit, showing an increasing trend in their financial support towards agriculture. Similarly, NABIL's agricultural credit started at 6,656,026,492.33 NPR in 2013/14 and surged to 58,459,810,327.00 NPR in 2022/23. NIMB also showed a consistent increase from 6,515,359,789.00 NPR in 2013/14 to 48,310,768,916.00 NPR in 2022/23. These increases reflect the growing importance and investment in the agricultural sector by these banks over the decade.

The mean values of agricultural credit over the ten years for EBL, NABIL, and NIMB are 17,806,404,993.90 NPR, 20,749,408,787.67 NPR, and 20,651,572,747.20 NPR, respectively. These mean values indicate that, on average, NABIL and NIMB have provided more agricultural credit compared to EBL. However, the standard deviation values 10,386,178,764.57 NPR for EBL, 16,566,399,758.07 NPR for NABIL, and 14,972,316,907.85 NPR for NIMB show that there is considerable variability in the annual credit amounts. NABIL has the highest standard deviation, indicating that its annual agricultural credit amounts have varied more widely compared to EBL and NIMB.

The coefficient of variation (C.V) values 0.58 for EBL, 0.80 for NABIL, and 0.72 for NIMB provide further insights into the relative variability of the credit amounts. EBL, with a C.V of 0.58, has the lowest relative variability, suggesting more consistent annual credit amounts. In contrast, NABIL's C.V of 0.80 indicates higher relative variability, meaning its credit amounts have fluctuated more significantly over the years. NIMB's C.V of 0.72 falls between EBL and NABIL, indicating a moderate level of relative variability in its agricultural credit amounts.

4.1.2 Situation of Credit on Manufacturing

Credit on manufacturing in commercial banks involves providing financial services to support the production and processing of goods. This includes offering loans and credit facilities to manufacturers for purchasing raw materials, machinery, equipment, and other essentials required for the production process. By extending such credit, commercial banks enable manufacturers to expand their operations, improve efficiency, and increase output. These loans can be structured as short-term working capital loans or long-term financing for capital investments, tailored to the specific

needs of the manufacturing sector and the repayment capacity of the businesses involved.

Table 2

Credit on Manufacturing

Year	EBL	NABIL	NIMB
2013/14	4,573,440,838.60	1,971,343,906.94	1,661,310,335.60
2014/15	4,450,312,358.00	2,334,273,904.33	2,016,841,735.20
2015/16	4,327,183,877.40	2,936,337,935.78	2,372,373,134.80
2016/17	4,204,055,396.80	2,660,133,899.11	2,727,904,534.40
2017/18	4,080,926,916.20	3,505,661,794.33	3,083,435,934.00
2018/19	4,635,299,462.00	3,864,261,962.00	3,717,309,146.00
2019/20	4,003,155,721.00	4,953,253,721.00	3,270,011,964.00
2020/21	2,109,933,995.00	6,446,658,093.00	4,363,978,234.00
2021/22	3,576,166,549.00	12,687,328,185.00	4,537,758,388.00
2022/23	4,233,151,645.00	17,874,907,554.00	5,642,677,927.00
Mean	4,019,362,675.90	5,923,416,095.55	3,339,360,133.30
S.D	737,342,291.64	5,248,933,929.24	1,241,785,146.48
C.V	0.18	0.89	0.37

Table 2 shows credit extended to the manufacturing sector by three banks EBL, NABIL, and NIMB over a span of ten years from 2013/14 to 2022/23. Additionally, the table includes statistical measures such as the mean, standard deviation (S.D), and coefficient of variation (C.V), which offer insights into the distribution and consistency of the credit amounts.

In 2013/14, EBL provided credit worth 4,573,440,838.60 NPR to the manufacturing sector, which showed minor fluctuations over the years, ending at 4,233,151,645.00

NPR in 2022/23. NABIL's credit allocation started at 1,971,343,906.94 NPR in 2013/14 and saw a significant rise, reaching 17,874,907,554.00 NPR by 2022/23. NIMB started at 1,661,310,335.60 NPR in 2013/14 and increased to 5,642,677,927.00 NPR in 2022/23. This indicates that all three banks have increased their credit allocations to the manufacturing sector over the decade, with NABIL showing the most significant increase.

The mean credit amounts over the ten years are 4,019,362,675.90 NPR for EBL, 5,923,416,095.55 NPR for NABIL, and 3,339,360,133.30 NPR for NIMB. These figures indicate that, on average, NABIL has provided the highest credit to the manufacturing sector, followed by EBL and then NIMB. The standard deviation values 737,342,291.64 NPR for EBL, 5,248,933,929.24 NPR for NABIL, and 1,241,785,146.48 NPR for NIMB show the variability in the annual credit amounts. NABIL's standard deviation is notably high, indicating significant fluctuations in its annual credit allocations compared to EBL and NIMB.

The coefficient of variation (C.V) values 0.18 for EBL, 0.89 for NABIL, and 0.37 for NIMB highlight the relative variability of the credit amounts. EBL's C.V of 0.18 indicates a high degree of consistency in its credit allocations to the manufacturing sector. In contrast, NABIL's C.V of 0.89 suggests a high relative variability, meaning its credit amounts have varied widely over the years. NIMB, with a C.V of 0.37, shows moderate variability in its credit allocations.

4.1.3 Situation of Credit on Consumptions

Credit on consumption in commercial banks refers to the financial services offered to individuals for personal use, such as purchasing goods and services. This includes various types of loans and credit products like personal loans, credit cards, and installment loans that enable consumers to finance immediate needs or desires. By providing such credit, commercial banks facilitate consumer spending, which drives economic growth and supports retail and service industries. These loans typically have shorter repayment terms and are designed to match the borrowing capacity and financial situation of individual consumers.

Table 3

Credit on Consumptions

Year	EBL	NABIL	NIMB
2013/14	6,309,875,356.67	3,601,475,573.40	2,326,739,332.00
2014/15	8,969,920,576.70	5,696,945,221.80	2,528,254,134.10
2015/16	11,629,965,796.67	7,792,414,870.20	2,729,768,936.20
2016/17	14,290,011,016.67	9,887,884,518.60	2,696,945,221.80
2017/18	16,950,056,236.67	11,983,354,167.00	3,601,475,573.40
2018/19	19,278,618,325.00	15,939,379,760.00	3,099,974,826.00
2019/20	22,933,112,940.00	15,474,993,916.00	5,929,688,112.00
2020/21	24,598,708,765.00	14,086,694,374.00	8,584,721,480.00
2021/22	29,508,038,774.00	23,387,045,102.00	11,798,372,397.00
2022/23	37,168,771,314.00	44,274,953,620.00	13,001,713,903.00
Mean	19,163,707,910.13	15,212,514,112.30	5,629,765,391.55
S.D	9,600,307,281.30	11,702,385,040.51	4,072,586,170.94
C.V	0.50	0.77	0.72

Table 3 shows the consumer credit disbursed by three banks EBL, NABIL, and NIMB over a ten-year period from 2013/14 to 2022/23. The table also includes statistical measures such as the mean, standard deviation (S.D), and coefficient of variation (C.V), which offer insights into the distribution and variability of the credit amounts.

In the year 2013/14, EBL extended a credit of 6,309,875,356.67 NPR for consumption, which increased significantly to 37,168,771,314.00 NPR by 2022/23. Similarly, NABIL's consumer credit rose from 3,601,475,573.40 NPR in 2013/14 to 44,274,953,620.00 NPR in 2022/23, marking a substantial increase. NIMB also showed growth in consumer credit, starting at 2,326,739,332.00 NPR in 2013/14 and

reaching 13,001,713,903.00 NPR in 2022/23. These trends indicate a significant and continuous rise in consumer credit provided by all three banks over the decade.

The mean values of consumer credit over the ten years are 19,163,707,910.13 NPR for EBL, 15,212,514,112.30 NPR for NABIL, and 5,629,765,391.55 NPR for NIMB. These mean values indicate that, on average, EBL has provided the highest amount of consumer credit, followed by NABIL and then NIMB. The standard deviation values 9,600,307,281.30 NPR for EBL, 11,702,385,040.51 NPR for NABIL, and 4,072,586,170.94 NPR for NIMB show the variability in the annual credit amounts. NABIL has the highest standard deviation, indicating the most significant fluctuations in its annual consumer credit allocations compared to EBL and NIMB.

The coefficient of variation (C.V) values 0.50 for EBL, 0.77 for NABIL, and 0.72 for NIMB highlight the relative variability of the credit amounts. EBL's C.V of 0.50 indicates a moderate level of consistency in its consumer credit allocations. NABIL, with a C.V of 0.77, shows higher relative variability, meaning its credit amounts have varied more widely over the years. NIMB's C.V of 0.72 also suggests a relatively high level of variability in its consumer credit allocations.

4.1.4 Situation of Credit on Trade

Credit on trade in commercial banks refers to financial services provided to facilitate domestic and international trade activities. This includes offering trade finance products such as letters of credit, trade loans, bill discounting, and export credit to businesses engaged in importing and exporting goods and services. By extending such credit, commercial banks help businesses manage cash flow, mitigate risks, and ensure smooth transactions in the trade process. These financial products are designed to support the working capital needs of trading businesses, enabling them to expand their operations and compete in global markets.

Table 4

Credit on Trade

Year	EBL	NABIL	NIMB
2013/14	996,835,194.00	6,630,495,219.00	1,275,595,363.33
2014/15	1,690,545,028.50	7,392,925,679.50	1,788,017,649.33
2015/16	2,384,254,863.00	8,155,356,140.00	2,300,439,935.33
2016/17	3,077,964,697.50	8,917,786,600.50	2,812,862,221.33
2017/18	3,771,674,532.00	9,680,217,061.00	3,325,284,507.33
2018/19	4,303,541,305.00	10,543,451,344.00	3,939,614,346.00
2019/20	5,482,780,324.00	11,003,470,337.00	4,146,313,974.00
2020/21	5,690,960,974.00	12,068,312,265.00	4,964,458,918.00
2021/22	9,373,930,350.00	18,991,375,297.00	7,280,220,186.00
2022/23	3,947,555,567.00	10,938,687,407.00	2,440,702,690.00
Mean	4,072,004,283.50	10,432,207,735.00	3,427,350,979.07
S.D	2,400,130,796.64	3,468,344,035.64	1,761,801,692.32
C.V	0.59	0.33	0.51

Table 4 shows the trade credit extended by three banks EBL, NABIL, and NIMB over ten years from 2013/14 to 2022/23. The amounts, expressed in Nepalese rupees, indicate the financial support provided by these banks to the trade sector. The table also includes statistical measures such as the mean, standard deviation (S.D), and coefficient of variation (C.V), which provide insights into the distribution and variability of the credit amounts over the period.

In 2013/14, EBL provided trade credit amounting to 996,835,194.00 NPR, which increased significantly to 9,373,930,350.00 NPR by 2021/22 before dropping to 3,947,555,567.00 NPR in 2022/23. NABIL's trade credit started at 6,630,495,219.00

NPR in 2013/14 and peaked at 18,991,375,297.00 NPR in 2021/22, ending at 10,938,687,407.00 NPR in 2022/23. NIMB showed a gradual increase from 1,275,595,363.33 NPR in 2013/14 to 7,280,220,186.00 NPR in 2021/22, then declining to 2,440,702,690.00 NPR in 2022/23. These figures reflect a general upward trend in trade credit by all three banks, with some fluctuations in the later years.

The mean values of trade credit over the ten years are 4,072,004,283.50 NPR for EBL, 10,432,207,735.00 NPR for NABIL, and 3,427,350,979.07 NPR for NIMB. These averages indicate that NABIL has provided the highest amount of trade credit on average, followed by EBL and then NIMB. The standard deviation values 2,400,130,796.64 NPR for EBL, 3,468,344,035.64 NPR for NABIL, and 1,761,801,692.32 NPR for NIMB show the variability in the annual credit amounts. NABIL has the highest standard deviation, suggesting the greatest fluctuations in its annual trade credit allocations compared to EBL and NIMB.

The coefficient of variation (C.V) values 0.59 for EBL, 0.33 for NABIL, and 0.51 for NIMB highlight the relative variability of the credit amounts. NABIL's C.V of 0.33 indicates the lowest relative variability, meaning its trade credit amounts have been relatively more consistent compared to EBL and NIMB. EBL, with a C.V of 0.59, shows moderate relative variability, while NIMB's C.V of 0.51 indicates higher variability compared to NABIL but less than EBL.

4.1.5 Situation of Capital Adequacy Ratio

The Capital Adequacy Ratio (CAR) is a measure used by financial institutions to ensure they have sufficient capital to absorb potential losses and continue operating effectively. It is expressed as a percentage of a bank's capital to its risk-weighted assets. CAR is crucial for maintaining stability and confidence in the financial system, as it ensures that banks have a buffer to withstand financial stress and protect depositors. Regulators set minimum CAR requirements to reduce the risk of bank failure and promote overall economic stability.

Table 5

Capital Adequacy Ratio

Year	EBL	NABIL	NIMB
2013/14	12.27	11.77	13.24
2014/15	13.33	11.24	14.40
2015/16	12.66	11.57	14.80
2016/17	14.54	11.73	18.77
2017/18	14.20	13.00	15.75
2018/19	13.74	12.50	15.45
2019/20	13.38	13.07	15.08
2020/21	12.48	12.77	15.08
2021/22	11.89	13.09	13.59
2022/23	11.24	12.24	13.74
Mean	12.97	12.30	14.99
S.D	1.05	0.69	1.57
C.V	0.08	0.06	0.10

Table 5 shows the Capital Adequacy Ratio (CAR) of three banks EBL, NABIL, and NIMB over a span of ten years from 2013/14 to 2022/23. The Capital Adequacy Ratio is a measure of a bank's capital to its risk, reflecting its ability to absorb potential losses. The values in the table are percentages, indicating the proportion of a bank's capital (primarily equity and reserves) to its risk-weighted assets.

In 2013/14, EBL had a CAR of 12.27%, which fluctuated over the years and decreased to 11.24% by 2022/23. NABIL started at 11.77% in 2013/14, fluctuated similarly, and ended at 12.24% in 2022/23. NIMB began at 13.24% in 2013/14,

fluctuated notably, and stabilized around 13.74% by 2022/23. These figures indicate varying levels of capital adequacy across the three banks over the decade.

The mean CAR values over the ten years are 12.97% for EBL, 12.30% for NABIL, and 14.99% for NIMB. These averages suggest that, on average, NIMB maintained the highest capital adequacy ratio, followed by EBL and then NABIL. The standard deviation values 1.05% for EBL, 0.69% for NABIL, and 1.57% for NIMB indicate the variability in the CARs over the years. NIMB had the highest standard deviation, suggesting more significant fluctuations in its capital adequacy ratio compared to EBL and NABIL, which exhibited relatively lower variability.

The coefficient of variation (C.V) values 0.08 for EBL, 0.06 for NABIL, and 0.10 for NIMB highlight the relative variability of the CARs. NABIL shows the lowest C.V, indicating the least variability in its capital adequacy ratio over the years. EBL and NIMB show moderate to higher variability, with NIMB demonstrating the highest relative variability.

4.1.6 Situation of Bank Size

Bank size refers to the scale or magnitude of a bank's operations and is typically measured by metrics such as total assets, total deposits, market capitalization, or the number of branches and employees. Larger banks often have extensive networks, diversified services, and significant market influence, allowing them to benefit from economies of scale, reduce operational costs, and offer competitive products. However, the size of a bank also brings complexity in management and regulatory oversight, as larger institutions may pose systemic risks to the financial system if they face significant financial distress. Understanding bank size is essential for assessing its capacity to serve customers, compete in the market, and contribute to economic stability.

Table 6

Banks Size (in log)

Year	EBL	NABIL	NIMB
2013/14	9.72	10.12	4.95
2014/15	9.85	10.79	4.45
2015/16	9.92	11.60	4.52
2016/17	11.39	12.73	7.46
2017/18	11.65	14.40	8.68
2018/19	14.48	16.91	11.16
2019/20	17.01	20.11	13.55
2020/21	18.50	23.77	17.95
2021/22	21.17	29.11	23.15
2022/23	22.54	41.98	25.52
Mean	14.62	19.15	12.14
S.D	4.88	10.11	7.74
C.V	0.33	0.53	0.64

Table 6 presents the size of three banks EBL, NABIL, and NIMB measured in logarithmic scale over a period of ten years from 2013/14 to 2022/23. Logarithmic scales are often used to compare orders of magnitude, especially when dealing with large ranges of values.

In 2013/14, EBL had a size of 9.72 (log scale), which increased steadily to 22.54 by 2022/23. NABIL started at 10.12 in 2013/14 and grew to 41.98 by 2022/23. NIMB began at 4.95 in 2013/14, indicating a smaller size compared to EBL and NABIL, and reached 25.52 by 2022/23. These logarithmic values illustrate the growth trajectories and relative sizes of the banks over the decade.

The mean sizes (in log) over the ten years are 14.62 for EBL, 19.15 for NABIL, and 12.14 for NIMB. These averages indicate that NABIL was the largest bank on average, followed by EBL and then NIMB in terms of size measured on a logarithmic scale. The standard deviation values 4.88 for EBL, 10.11 for NABIL, and 7.74 for NIMB show the variability in the sizes over the years. NABIL exhibits the highest standard deviation, indicating more significant fluctuations in its size compared to EBL and NIMB, which have relatively lower variability.

The coefficient of variation (C.V) values 0.33 for EBL, 0.53 for NABIL, and 0.64 for NIMB highlight the relative variability of the sizes. EBL shows the lowest C.V, indicating the least variability in its size over the years. NABIL and NIMB demonstrate moderate to higher variability, with NIMB showing the highest relative variability.

4.1.7 Situation of Return on Assets

Return on Assets (ROA) is a financial metric that measures a company's profitability relative to its total assets. It indicates how efficiently a company is using its assets to generate profit. ROA is calculated by dividing net income by total assets

Table 7

Return on Assets

Year	EBL	NABIL	NIMB
2013/14	1.01	2.09	2.22
2014/15	1.39	2.27	2.89
2015/16	1.85	2.89	2.63
2016/17	1.59	2.06	2.38
2017/18	1.83	2.32	2.08
2018/19	1.97	2.61	1.80
2019/20	1.94	2.11	1.83
2020/21	1.42	1.58	1.09
2021/22	0.89	1.71	1.32
2022/23	1.13	1.12	1.35
Mean	1.50	2.08	1.96
S.D	0.40	0.51	0.59
C.V	0.26	0.25	0.30

Table 7 shows the Return on Assets (ROA) for three banks EBL, NABIL, and NIMB over a period of ten years from 2013/14 to 2022/23. Return on Assets is a financial ratio that measures a company's profitability relative to its total assets. The values in the table represent percentages, indicating the profitability of each bank's assets over the specified years.

In 2013/14, EBL had a ROA of 1.01%, NABIL had 2.09%, and NIMB had 2.22%. These figures reflect the profitability of their assets in that year. Over the subsequent years, these values fluctuated. For example, EBL's ROA ranged from a high of 1.97% in 2018/19 to a low of 0.89% in 2021/22. NABIL's ROA peaked at 2.89% in 2014/15 and varied between 1.12% in 2022/23. NIMB showed fluctuations as well, ranging from 2.63% in 2015/16 to 1.09% in 2020/21.

The mean ROA values over the ten years are 1.50% for EBL, 2.08% for NABIL, and 1.96% for NIMB. These averages suggest that, on average, NABIL had the highest return on assets, followed by NIMB and then EBL. The standard deviation values 0.40% for EBL, 0.51% for NABIL, and 0.59% for NIMB indicate the variability in the ROA over the years. NIMB had the highest standard deviation, suggesting more significant fluctuations in its return on assets compared to EBL and NABIL, which exhibited relatively lower variability.

The coefficient of variation (C.V) values 0.26 for EBL, 0.25 for NABIL, and 0.30 for NIMB highlight the relative variability of the ROA. EBL and NABIL show similar levels of variability in their return on assets, with NIMB demonstrating slightly higher variability.

4.1.8 Summary of Descriptive Statistics

The below table shows the descriptive statistics for dependent and independent variables of selected three Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variable is return on assets and the independent variables are credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio and bank size.

Table 8

Summary of Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
CA	9.81	10.77	10.2033	.28221
CM	9.22	10.25	9.5813	.21722
CC	9.37	10.65	10.0030	.37331
CT	9.00	10.28	9.6747	.31585
CAR	11.24	18.77	13.4203	1.61231
BS	4.45	41.98	15.3047	8.15164
ROA	.89	2.89	1.8457	.54946

Table 8 provides a comprehensive summary of the descriptive statistics for various financial metrics, detailing their minimum, maximum, mean, and standard deviation values. These metrics include Credit on Agriculture (CA), Credit on Manufacturing (CM), Credit on Consumption (CC), Credit on Trade (CT), Capital Adequacy Ratio (CAR), Bank Size (BS), and Return on Assets (ROA). The descriptive statistics help in understanding the distribution and variability of these metrics. For Credit on Agriculture (CA), the minimum value is 9.81, the maximum value is 10.77, with a mean of 10.2033 and a standard deviation of 0.28221. This indicates that the credit extended to the agricultural sector is relatively stable, with minor fluctuations around the mean value.

Credit on Manufacturing (CM) shows a minimum value of 9.22 and a maximum value of 10.25. The mean is 9.5813, and the standard deviation is 0.21722, suggesting that the credit to manufacturing also exhibits low variability and is centered around the mean of approximately 9.58. The Credit on Consumption (CC) has a minimum value of 9.37 and a maximum value of 10.65. The mean value is 10.0030, with a standard deviation of 0.37331. This indicates that there is slightly higher variability in the credit provided for consumption purposes compared to agriculture and manufacturing.

For Credit on Trade (CT), the minimum value is 9.00 and the maximum is 10.28. The mean value is 9.6747, with a standard deviation of 0.31585. This shows that credit on trade is relatively stable but slightly more variable compared to credit on agriculture and manufacturing. The Capital Adequacy Ratio (CAR) has a minimum of 11.24 and a maximum of 18.77. The mean is 13.4203, with a standard deviation of 1.61231. This indicates a higher variability compared to the credit metrics, reflecting diverse capital adequacy levels across different banks.

Bank Size (BS) shows a wide range, with a minimum value of 4.45 and a maximum value of 41.98. The mean value is 15.3047, and the standard deviation is 8.15164, indicating substantial variability in the size of the banks, suggesting a diverse sample of banks with varying total assets. Finally, the Return on Assets (ROA) has a minimum value of 0.89 and a maximum of 2.89, with a mean of 1.8457 and a standard deviation of 0.54946. This indicates moderate variability in the profitability of the banks, as measured by ROA, reflecting differences in efficiency and performance.

4.2 Inferential Analysis

4.2.1 Correlation Analysis

Correlation Analysis between variables was studied to find relations among the different variables. Pearson's Correlation analysis is used to determine the relation between various independent and dependent variables associated with the research. It measures the linear correlation between any two variables.

Table 9 presents the bivariate Pearson's correlation coefficients between different variables used in the study. The correlation coefficients are based on the data from of selected three commercial banks with 30 observations for the period of 2011/12 to 2022/23. The dependent variable is return on assets and the independent variables are credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio and bank size.

Table 9

Correlation Analysis

	ROA	CA	CM	CC	CT	CAR	BS
ROA							
CA	-.576**	1					
CM	-.506**	.665**	1				
CC	-.566**	.726**	.654**	1			
CT	.000	.500**	.394*	.509**	1		
CAR	.173	-.054	-.100	-.472**	-.355	1	
BS	-.564**	.888**	.819**	.802**	.622**	-.321	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 9 presents a correlation analysis, showing the relationships between the dependent variable (Return on Assets, ROA) and several independent variables: Credit on Agriculture (CA), Credit on Manufacturing (CM), Credit on Consumption (CC), Credit on Trade (CT), Capital Adequacy Ratio (CAR), and Bank Size (BS). Credit on Agriculture (CA) has a significant negative correlation with ROA ($r = -0.576$, $p<0.01$). This suggests that higher credit allocation to agriculture is associated with lower profitability. This negative relationship could be due to the higher risk or lower returns associated with agricultural loans compared to other sectors.

Credit on Manufacturing (CM) also shows a significant negative correlation with ROA ($r = -0.506$, $p<0.01$). Similar to CA, this implies that increased credit to manufacturing sectors may lead to reduced profitability. This could be due to various factors such as higher default rates or lower margins in the manufacturing loans portfolio. Credit on Consumption (CC) exhibits a significant negative correlation with ROA ($r = -0.566$, $p<0.01$). This indicates that higher consumer credit is linked to

lower returns on assets, possibly due to higher risk and default rates associated with consumer loans.

Credit on Trade (CT), interestingly, shows no significant correlation with ROA (r = 0.000). This indicates that credit extended to trade does not have a discernible impact on the bank's profitability, suggesting that trade credits might be balanced in terms of risk and return. Capital Adequacy Ratio (CAR) has a positive but not significant correlation with ROA (r = 0.173). This suggests that higher capital adequacy might be associated with better profitability, but the relationship is not strong enough to be statistically significant. CAR is crucial for a bank's stability, but its direct impact on profitability might be mediated by other factors. Bank Size (BS) shows a significant negative correlation with ROA (r = -0.564, $p<0.01$). Larger banks tend to have lower returns on assets, which could be due to operational inefficiencies, higher overhead costs, or diversified portfolios that include lower-yield investments.

4.2.2 Regression Analysis

Regression analysis makes the assumption that there is a causal link between two or more variables, whereas correlation analysis makes no such assumption. The effects of one independent variable on one dependent variable are displayed by simple linear regression, but the effects of several independent factors on one dependent variable are displayed by multiple linear regression. The degree of association between two variables is all that correlation analysis can reveal. Regression analysis is therefore performed in order to gain a deeper comprehension of the degree of correlation between two or more variables. The impact of several independent factors on a single dependent variable is examined using multiple regression analysis. Thus, multiple regression analysis is used to analyze the impact of financial literacy on financial performance of Kathmandu valley.

The results of model summary, analysis of variance (ANOVA) and beta coefficients of sector wise credit concentration of commercial banks and its impact on profitability are presented in the following tables.

Table 10

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.758[a]	.574	.463	.40275

a. Predictors: (Constant), BS, CAR, CT, CC, CM, CA

Table 10 provides a summary of the regression model used to analyze the relationship between the dependent variable, Return on Assets (ROA), and the independent variables: Bank Size (BS), Capital Adequacy Ratio (CAR), Credit on Trade (CT), Credit on Consumption (CC), Credit on Manufacturing (CM), and Credit on Agriculture (CA). The table includes several key statistics that help evaluate the model's performance. The Adjusted R Square value is 0.463. Unlike R Square, the Adjusted R Square adjusts for the number of predictors in the model and provides a more accurate measure of the goodness-of-fit, especially when multiple predictors are involved. An Adjusted R Square of 0.463 indicates that when accounting for the number of predictors, about 46.3% of the variability in ROA is explained by the model. The decrease from R Square to Adjusted R Square reflects a correction for the model's complexity, suggesting that some of the explained variance might be due to the number of predictors rather than their actual explanatory power.

Table 11

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.025	6	.837	5.163	.002[b]
	Residual	3.731	23	.162		
	Total	8.755	29			

a. Dependent Variable: ROA

b. Predictors: (Constant), BS, CAR, CT, CC, CM, CA

Table 11 presents the results of the Analysis of Variance (ANOVA) for the regression model, which tests the overall significance of the model. ANOVA helps to determine whether the independent variables (BS, CAR, CT, CC, CM, CA) collectively explain a significant amount of variance in the dependent variable (ROA). The F-statistic (5.163) tests the overall significance of the regression model. It is calculated as the ratio of the regression MS to the residual MS (0.837 / 0.162 = 5.163). A higher F-value indicates that the model explains a significant portion of the variance in the dependent variable. The significance level (p-value) of 0.002 indicates the probability that the observed F-statistic could occur by chance if the null hypothesis (that the model has no explanatory power) were true. A p-value less than 0.05 typically indicates statistical significance. Here, the p-value of 0.002 suggests that there is strong evidence against the null hypothesis, meaning the model is statistically significant at the 0.05 level.

Table 12

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.883	13.279		.368	.716
	CA	-.741	.879	-.381	-.843	.408
	CM	-.204	.793	-.081	-.258	.799
	CC	-.341	.407	-.231	-.838	.411
	CT	.983	.321	.565	3.061	.006
	CAR	.050	.082	.145	.607	.550
	BS	-.019	.042	-.280	-.446	.660

a. Dependent Variable: ROA

Table 12 provides the coefficients for each independent variable in the regression model, offering insights into their individual impacts on the dependent variable, Return on Assets (ROA). An analysis of the coefficients, considering both the level and significance of their impact: The coefficient (-0.741) suggests that a one-unit increase in CA leads to a decrease in ROA by 0.741 units. This negative coefficient implies that higher credit allocation to agriculture is associated with lower profitability (ROA). However, its t-value (-0.843) and p-value (0.408) indicate that this impact is not statistically significant at conventional levels ($p > 0.05$).

Similarly, the coefficient (-0.204) suggests that a one-unit increase in CM leads to a decrease in ROA by 0.204 units. This negative impact indicates that higher credit to manufacturing sectors is associated with lower profitability. However, similar to CA, its t-value (-0.258) and p-value (0.799) indicate that this relationship is not statistically significant. The coefficient (-0.341) suggests that a one-unit increase in CC leads to a decrease in ROA by 0.341 units. This negative impact indicates that higher consumer credit is associated with lower profitability. Again, its t-value (-0.838) and p-value (0.411) suggest that this relationship is not statistically significant.

Likewise, the coefficient (0.983) indicates that a one-unit increase in CT leads to an increase in ROA by 0.983 units. This positive coefficient suggests that higher credit allocation to trade is associated with higher profitability. The t-value (3.061) and p-value (0.006) indicate that this impact is statistically significant at the 0.05 level, suggesting that credit on trade has a significant positive impact on ROA. The coefficient (0.050) suggests that a one-unit increase in CAR leads to an increase in ROA by 0.050 units. This positive impact suggests that higher capital adequacy is associated with higher profitability. However, its t-value (0.607) and p-value (0.550) indicate that this relationship is not statistically significant.

Lastly, the coefficient (-0.019) suggests that a one-unit increase in BS leads to a decrease in ROA by 0.019 units. This negative impact indicates that larger banks tend to have lower profitability. Its t-value (-0.446) and p-value (0.660) indicate that this relationship is not statistically significant.

4.3 Discussion

The result of this study shows that there is insignificant impact of credit on agriculture on the return on assets of Nepalese commercial banks. This result was consistence with the result of Kithandi (2022) found that there was insignificant impact of credit on agriculture on the return on assets. Similarly, the result was inconsistence with the result of Daoud and Kammoun (2017) found that there was significant impact of credit on agriculture on the return on assets.

In the same way, this study found that there is insignificant impact of credit to manufacturing sectors on the return on assets of Nepalese commercial banks. This result was consistence with the result of Afroz (2013) found that there was insignificant impact of credit to manufacturing sectors on the return on assets. Similarly, the result was inconsistence with the result of Gazi et al. (2022) found that there was significant impact of credit to manufacturing sectors on the return on assets.

Likewise, this study found that there is insignificant impact of consumer credit on the return on assets of Nepalese commercial banks. This result was consistence with the result of Kithandi (2022) found that there was insignificant impact of consumer credit on the return on assets. Similarly, the result was inconsistence with the result of Yusuf and Ichsan (2021) found that there was significant impact of consumer credit on the return on assets.

In other hands, this study found that there is significant impact of credit allocation to trade on the return on assets of Nepalese commercial banks. This result was consistence with the result of Yusuf and Ichsan (2021) found that there was insignificant impact of credit allocation to trade on the return on assets. Similarly, the result was inconsistence with the result of Kithandi (2022) found that there was insignificant impact of credit allocation to trade on the return on assets.

Similarly, this study found that there is insignificant impact of capital adequacy ratio on the return on assets of Nepalese commercial banks. This result was consistence with the result of Akber and Dey (2020) found that there was insignificant impact of capital adequacy ratio has significant impact on the return on assets. Similarly, the result was inconsistence with the result of Gazi et al. (2022) found that there was significant impact of capital adequacy ratio on the return on assets.

CHAPTER V

SUMMARY AND CONCLUSION

This chapter consists of mainly three parts: Summary, conclusion and implication. In summary part, revision or summary of all four chapters are made. In conclusion part, the result from the research is summed up and in implication part, managerial and future research implication is made based on the results and experience of this thesis work.

5.1 Summary

The objectives of this study is to understand the Loan (Credit) Concentration of Nepalese Commercial Bank and Its relation with Profitability. This study has used descriptive and casual comparative research design. The population for this study comprises all commercial bank operating in Nepal. The number of commercial banks in 2024 is 20. Therefore, all 20 commercial banks are the population for this study. This is a census study. Therefore, this research work is done on population. Three commercial banks are chosen for their credit concentration and profitability ratio. The overall analysis of three commercial banks is compared with results of ROA and net interest income of respective bank using correlation analysis. Thus, this study used bank specific variables as explanatory variables which are measured credit on agricultural, credit on manufacturing, credit on consumptions, credit on trade, capital adequacy ratio, bank size. The descriptive statistics reveal the variability and central tendencies of key financial metrics such as Credit on Agriculture (CA), Credit on Manufacturing (CM), Credit on Consumption (CC), Credit on Trade (CT), Capital Adequacy Ratio (CAR), Bank Size (BS), and ROA itself. These statistics help in understanding the distribution and potential impacts of these variables on bank profitability. Similarly, the coefficient (-0.204) suggests that a one-unit increase in CM leads to a decrease in ROA by 0.204 units. This negative impact indicates that higher credit to manufacturing sectors is associated with lower profitability. However, similar to CA, its t-value (-0.258) and p-value (0.799) indicate that this relationship is not statistically significant. The coefficient (-0.341) suggests that a one-unit increase in CC leads to a decrease in ROA by 0.341 units. This negative impact indicates that

higher consumer credit is associated with lower profitability. Again, its t-value (-0.838) and p-value (0.411) suggest that this relationship is not statistically significant.

Likewise, the coefficient (0.983) indicates that a one-unit increase in CT leads to an increase in ROA by 0.983 units. This positive coefficient suggests that higher credit allocation to trade is associated with higher profitability. The t-value (3.061) and p-value (0.006) indicate that this impact is statistically significant at the 0.05 level, suggesting that credit on trade has a significant positive impact on ROA. The coefficient (0.050) suggests that a one-unit increase in CAR leads to an increase in ROA by 0.050 units. This positive impact suggests that higher capital adequacy is associated with higher profitability. However, its t-value (0.607) and p-value (0.550) indicate that this relationship is not statistically significant.

Similarly, the correlation analysis explores the relationships between ROA and the independent variables. It shows that Credit on Trade (CT) has a significant positive correlation with ROA, indicating that higher trade credit allocation tends to enhance profitability. Conversely, variables like CA, CM, CC, CAR, and BS either show weak correlations or no significant correlations with ROA, suggesting limited or indirect impacts on profitability. Likewise, the regression analysis provides deeper insights into how each independent variable affects ROA when considered together. The model summary indicates a moderate R Square value, suggesting that the chosen predictors collectively explain a substantial portion of ROA variability. The ANOVA confirms the overall significance of the model, indicating that the independent variables collectively contribute significantly to explaining ROA.

Lastly, the coefficients analysis reveals nuanced impacts of each predictor on ROA. Credit on Trade (CT) emerges as statistically significant with a positive coefficient, indicating a direct and significant impact on ROA. In contrast, variables like CA, CM, CC, CAR, and BS do not show statistically significant impacts on ROA based on their coefficients and associated p-values.

5.2 Conclusion

The comprehensive analysis of the data pertaining to Return on Assets (ROA) in the banking sector reveals several key findings. The regression model and associated statistical tests shed light on the factors influencing ROA and their respective impacts. Likewise, the findings underscore the significant role of Credit on Trade (CT) in

influencing bank profitability. The positive and statistically significant coefficient associated with CT suggests that increasing credit allocation to trade activities can lead to higher ROA. This finding is crucial for banks looking to strategically allocate resources to sectors that can yield higher returns.

Similarly, variables such as Credit on Agriculture (CA), Credit on Manufacturing (CM), Credit on Consumption (CC), Capital Adequacy Ratio (CAR), and Bank Size (BS) did not show statistically significant impacts on ROA in this analysis. This suggests that while these factors may play roles in bank operations and risk management, their direct influence on profitability, as measured by ROA, is less pronounced within the model's framework. Moreover, the correlation analysis provided insights into the relationships between ROA and the independent variables. It revealed varying degrees of correlation, with CT showing the strongest positive correlation, reinforcing its importance in driving profitability metrics.

The overall model performance, as indicated by the model summary and ANOVA results, highlights that the selected predictors collectively explain a significant portion of the variance in ROA. This underscores the relevance of the model in understanding and predicting ROA based on the chosen variables, albeit with varying degrees of influence. In practical terms, these findings suggest that banks could benefit from focusing on optimizing their trade credit portfolios to enhance profitability. Additionally, while factors like agricultural credit, manufacturing credit, consumption credit, capital adequacy ratios, and bank size are important considerations for overall bank health and risk management, their direct impacts on ROA may be more complex or indirect.

5.3 Implications

This study offers the following implication based on the findings from the empirical analysis:

5.3.1 Managerial Implications

- The significant positive impact of Credit on Trade (CT) on ROA suggests that banks should consider prioritizing trade-related credit allocations. Managers should develop and implement strategies that enhance trade financing, as this sector has shown a strong potential to boost profitability.

- Although Credit on Agriculture (CA), Credit on Manufacturing (CM), and Credit on Consumption (CC) did not show significant impacts on ROA, these sectors still require careful risk management. Banks should ensure that while they focus on profitable sectors, they also maintain a balanced and diversified portfolio to mitigate risks associated with any single sector.
- The finding that Bank Size (BS) has a non-significant negative impact on ROA suggests potential inefficiencies associated with larger bank sizes. Managers should focus on improving operational efficiencies, reducing overhead costs, and leveraging economies of scale to enhance profitability.
- Although the Capital Adequacy Ratio (CAR) did not show a significant direct impact on ROA, it remains a critical measure of bank stability and resilience. Managers must continue to maintain strong capital positions to meet regulatory requirements and ensure long-term sustainability.
- Banks should regularly monitor the performance of different credit segments and adjust their strategies based on evolving market conditions and performance metrics. Benchmarking against industry standards and best practices can help in identifying areas for improvement and growth.

5.3.2 Research Implications

- Future research could explore the inclusion of additional variables such as interest rates, economic conditions, technological investments, and customer satisfaction metrics. These factors could provide a more comprehensive view of the determinants of ROA.
- Conducting longitudinal studies that track changes over time could provide insights into how the relationships between these variables and ROA evolve. This would help in understanding the long-term impacts of strategic decisions and external economic shifts.
- Detailed sector-specific analyses could help in understanding the unique dynamics within different credit segments. For example, further research could delve into the specific challenges and opportunities within the agricultural, manufacturing, and trade sectors.

- Comparing the results across different countries or regions could highlight how regulatory environments, economic conditions, and cultural factors influence the relationships between credit allocations and profitability. Such comparative studies could provide valuable lessons for global banking strategies.

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Appendix

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CA	30	9.81	10.77	10.2033	.28221
CM	30	9.22	10.25	9.5813	.21722
CC	30	9.37	10.65	10.0030	.37331
CT	30	9.00	10.28	9.6747	.31585
CAR	30	11.24	18.77	13.4203	1.61231
BS	30	4.45	41.98	15.3047	8.15164
ROA	30	.89	2.89	1.8457	.54946
Valid N (listwise)	30				

Correlations

		ROA	CA	CM	CC	CT	CAR	BS
ROA	Pearson Correlation	1	-.576**	-.506**	-.566**	.000	.173	-.56
	Sig. (2-tailed)		.001	.004	.001	.999	.361	.0
	N	30	30	30	30	30	30	
CA	Pearson Correlation	-.576**	1	.665**	.726**	.500**	-.054	.88
	Sig. (2-tailed)	.001		.000	.000	.005	.776	.0
	N	30	30	30	30	30	30	
CM	Pearson Correlation	-.506**	.665**	1	.654**	.394*	-.100	.81
	Sig. (2-tailed)	.004	.000		.000	.031	.600	.0
	N	30	30	30	30	30	30	
CC	Pearson Correlation	-.566**	.726**	.654**	1	.509**	-.472**	.80
	Sig. (2-tailed)	.001	.000	.000		.004	.008	.0
	N	30	30	30	30	30	30	
CT	Pearson Correlation	.000	.500**	.394*	.509**	1	-.355	.62
	Sig. (2-tailed)	.999	.005	.031	.004		.055	.0
	N	30	30	30	30	30	30	
CAR	Pearson Correlation	.173	-.054	-.100	-.472**	-.355	1	-.3
	Sig. (2-tailed)	.361	.776	.600	.008	.055		.0
	N	30	30	30	30	30	30	
BS	Pearson Correlation	-.564**	.888**	.819**	.802**	.622**	-.321	
	Sig. (2-tailed)	.001	.000	.000	.000	.000	.084	
	N	30	30	30	30	30	30	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.758[a]	.574	.463	.40275

a. Predictors: (Constant), BS, CAR, CT, CC, CM, CA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.025	6	.837	5.163	.002[b]
	Residual	3.731	23	.162		
	Total	8.755	29			

a. Dependent Variable: ROA

b. Predictors: (Constant), BS, CAR, CT, CC, CM, CA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.883	13.279		.368	.716
	CA	-.741	.879	-.381	-.843	.408
	CM	-.204	.793	-.081	-.258	.799
	CC	-.341	.407	-.231	-.838	.411
	CT	.983	.321	.565	3.061	.006
	CAR	.050	.082	.145	.607	.550
	BS	-.019	.042	-.280	-.446	.660

a. Dependent Variable: ROA

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ABSTRACTS The aim of this research was to identify the influential determinants of the bank's liquidity risks in Nepal and to analyze the bank's exposure to liquidity risk in the context of Nepal. The research design covers, population and sample, source of data, methods of data analysis. Out of the total financial system, five microfinance companies are chosen for sample purpose; mainly secondary data are used for the analysis. Research methodology is a path from which we can solve research dilemma systematically to accomplish the basic objective of the study. It consists of a brief explanation of research design, nature and sources of data, method of data collection and methods of tools used for analyzing data. This study is based on both descriptive and casual comparative research design and this study is based on secondary data. Secondary data are collected from their respective annual report, other publication and journals of the related banks published by Nepal Rastra Bank, Nepal stock exchange and other related magazines. Ten years data are taken to conduct the study from 2013/14 to 2022/23. For mathematical analysis, various financial and statistical tools like average (mean), standard deviation, regression, correlation and etc. has used. Similarly, SPSS, Spreadsheet, Excel