DETERMINANTS OF LENDING BEHAVIOR OF COMMERCIAL BANKS IN NEPAL

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

By

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CERTIFICATION OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled **"Determinants of Lending Behavior of Commercial Banks in Nepal"**. The work of this dissertation has not been submitted previously for the purpose of conferral of any degrees nor it has 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.

……..

Janak Sunar

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REPORT OF RESEARCH COMMITTEE

Mr. Janak Sunar has defended research proposal entitled **"Determinants of Lending Behavior of Commercial Banks in Nepal"** successfully. The research committee has registered the dissertation for further progress. It is recommended to carry out the work as per suggestions and guidance of supervisor Mr. Joginder Goet and submit the thesis for evaluation and viva voce examination.

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APPROVAL SHEET

We, the undersigned, have examined the dissertation entitled **"Determinants of Lending Behavior of Commercial Banks in Nepal"** presented by Mr. Janak Sunar 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

&	:	And
ATM	:	Automated Teller Machine
BS	:	Bikram Sambat
CAR	:	Capital Adequacy Ratio
CRR	:	Cash Reserve Ratio
DIR	:	Deposit Interest Rate
GDP	:	Gross Domestic Product
INF	:	Inflation
IRS	:	Interest Rate Spread
KBL	:	Kumari Bank Limited
KYC	:	Know Your Customer
LA	:	Loan and Advance
LnLA	:	Natural Logarithm of Loan and Advance
LnTD	:	Natural Logarithm Total Deposit
LTD	:	Limited
MBS	:	Master of Business Studies
NIMB	:	Nepal Investment Mega Bank Limited
NMB	:	Nepal Merchant Banking and Finance Limited
NPL	:	Non-Performing Loan
NRB	:	Nepal Rastra Bank
PRVU	:	Prabhu Bank Limited
ROA	:	Return on Assets
ROE	:	Return on Equity
SD	:	Standard Deviation
TD	:	Total Deposit
TU	:	Tribhuvan University

ABSTRACT

This research investigates the determinants of lending behavior of commercial banks in Nepal. It analyzes data from the top five banks over a decade (2013/14 to 2022/23). Using a descriptive and causal-comparative research approach, the study relies on secondary data from the banks' annual reports and financial statements. Descriptive and inferential statistical methods were employed, utilizing SPSS version 29 for analysis. The sample includes PRVU, NIMB, NMB, NIC Asia, and KBL. The study examines the relationships between independent variables (CRR, CAR, IRS, LnTD and INF) with the dependent variable (LnLA). The results show a moderate negative correlation between CRR and LnLA, indicating that higher CRR can limit lending. Conversely, a high positive correlation between CAR and LnLA suggests that well-capitalized banks tend to issue more loans. IRS has a minimal direct relationship with LnLA, whereas LnTD shows a strong positive correlation with LnLA, indicating that larger deposits are associated with more loans. INF has a moderate negative correlation with LnLA, implying that higher inflation can restrict lending activities. Moreover, CAR significantly positively influences LnLA indicating that higher CAR boosts lending capacity. IRS has a significant negative impact on LnLA, suggesting that wider interest rate spreads can inhibit lending. TD shows a strong positive effect on LnLA, emphasizing the role of substantial deposit bases in facilitating lending. However, CRR and INF are not significant predictors of LnLA, indicating their limited effect on lending behavior. Thus, the study concludes that CRR, IRS, TD and INF are key determinants of lending behavior in Nepalese commercial banks.

Keywords: *Loans and advances, cash reserve ratio, capital adequacy ratio, total deposit and inflation rate.*

CHAPTER – I
INTRODUCTION

1.1 Background of the study

Lending is the primary role in commercial banks' daily banking activities and is described as the heart of a commercial banks' banking business. On the other hand, it is also one of the greatest sources of risk to the safety and soundness of financial institutions (Yitayaw, 2021). Lending behavior of commercial banks refers to how they decide on loans and advances for individuals, businesses, and government, influenced by economic conditions, regulations and market demand crucial for economic growth.

Lending, offered by commercial banks on varying terms such as short, medium, or long-term, is a fundamental service provided to their clientele. This includes extending loans and advances to individuals, businesses, and governmental bodies, facilitating their engagement in investment and developmental endeavors, thus aiding their specific growth objectives and contributing to the overall economic progress of the country. Commercial banks follow formal protocols to cater to the loan and advance demands of their customers, who utilize these funds across diverse economic activities, thereby playing a significant role in the country's economic development (Olokoyo, 2011).

Banks' lending behaviors are essential for economic development and sustainability in developing countries (Alkhazaleh, 2017). They are crucial in mobilizing funds for households, businesses, and the government. Investment, business growth, and industrial development depend on these funds, and without them, an economy could stagnate or decline. Lending is the main business activity of commercial banks and represents their largest income source (Isa et al., 2019).

The behavior of lending in banking is intricately tied to factors such as the bank's type, capital and deposit bases, deposit density, interest rates, exchange rates, inflation, gross domestic product (GDP), liquidity, periodic credit guidelines from regulatory bodies, internal bank policies and various non-economic influences.

Ineffective banking lending practices may hinder economic growth and contribute to financial instability, emphasizing the importance of effective management. Bank lending decisions are shaped by both supply-side and demand-side factors, with efficient credit management crucial for balancing liquidity, profitability, and solvency goals. While credit growth can stimulate investment and economic activity, it also poses prudential risks at micro and macro levels, impacting financial system stability (Igan & Pinheiro, 2011). The lending behavior of banks is influenced by a range of factors, including the type of bank, its capital and deposit bases, deposit density, interest rates, exchange rates, inflation, gross domestic product (GDP), portfolio investment, liquidity, monetary and fiscal conditions, and the regular credit guidelines issued by supervisory authorities and internal bank policies. Additionally, non-economic factors also play a role in shaping bank lending practices (Timisina, 2016).

Lending involves more than just transferring money and returning it later. There is typically a cost associated with borrowing money, as lending imposes expenses on the lender (Charalambakis & Psychoyios, 2012). Commercial banks, being crucial financial institutions, play vital roles in the economic growth and development of a country (Yakubu & Affoi, 2014). The lending function of commercial banks is influenced by a range of internal and external factors. Internally, bank directors establish lending policies, while externally, regulatory actions by national banks and other financial sector authorities, along with broader macroeconomic events, also impact bank lending behavior (Richard & Okoye, 2014).

The banking sector plays a pivotal role in the financial ecosystem, acting as a crucial intermediary by aggregating household savings through diverse deposit types and channeling these funds into the economy via lending across various sectors. Within commercial banks, lending emerges as a cornerstone activity, forming the bulk of their asset portfolios and serving as the primary driver of revenue generation (Malede, 2014). Credit policies within these banks are instrumental in structuring lending activities, ensuring asset quality, optimizing earnings, and aligning with strategic objectives (Caouette et al., 2011). Managing credit is a multifaceted and crucial task for the success of a bank, demanding thorough loan analysis encompassing factors such as borrower creditworthiness, economic conditions, industry trends, and collateral valuation (Adhikari, 2009). This intricate interplay of credit policies,

management practices, and analytical rigor underscores the pivotal role of banks in fostering economic growth, supporting investments, and upholding financial stability within the economy.

Commercial banks serve as the primary drivers of savings mobilization and financial resource allocation, making them indispensable entities in fostering economic growth and development. Their pivotal role encompasses harnessing their potential, scope, and opportunities to mobilize financial resources and channel them into productive investments. In this regard, commercial banks prioritize extending loans and advances to their diverse clientele while upholding the three core principles guiding their operations: profitability, liquidity, and solvency (Olokoyo, 2011). This strategic approach underscores the vital role that commercial banks play in fueling economic progress, facilitating investment activities, and contributing to overall financial stability within the economy.

Lending behavior in commercial banks is influenced by a range of factors, including interest rates, liquidity, inflation, exchange rates, capital, and economic growth (Akinlo & Oni, 2015). Bank lending decisions are shaped by both macro-economic factors and bank-specific considerations, such as inflation rates, exchange rates, capital levels, economic growth trends, management efficiency, and bank profitability (Kim & Sohn, 2017). The amount available for lending is influenced by variables like the bank's size, credit risk, interest rates, and liquidity (Moussa & Chedia, 2016). Numerous international and domestic studies have examined the factors impacting lending behavior, with examples including studies on Malaysian commercial banks (Isa et al., 2019), bank loan determinants in Tunisia (Mousa & Chedia, 2016), and interest rate determinants for Tanzanian banks (Shayo et al., 2020). In the context of Nepal, studies have identified variables like deposit volume, interest rates, GDP, and cash reserve requirements as key determinants of lending behavior in commercial banks (Bhattarai, 2020). However, the study's results revealed inconsistencies regarding these variables, with some studies suggesting that liquidity, interest rates, and capital are crucial determinants while others argue otherwise.

This study aims to assess the determinants of lending behavior of selected commercial banks in Nepal, focusing on variables like cash reserve ratio, capital adequacy ratio, interest rate spread, total deposit and inflation.

1.2 Problem statement

Lending plays a pivotal role in commercial banks, being a primary revenue source through interest income and contributing significantly to their overall profit (Onyango, 2018). Nonetheless, it also presents substantial risks, historically leading to significant losses for financial institutions (Alkhazaleh, 2017). Malede (2014) observed correlations between commercial bank lending and various factors in Ethiopia such as bank size, credit risk, GDP, and liquidity ratio. Surprisingly, deposit levels, investments, cash reserves, and interest rates did not affect Ethiopian commercial bank lending during the study period.

Bhari (2023) examined the determinants of lending behavior in Nepalese commercial banks from 2011 to 2020. The analysis focused on 15 banks, considering macroeconomic, industry-specific, and bank-specific factors. The data were gathered from reliable secondary sources, including the annual reports of the Nepal Rastra Bank and individual banks' websites. The findings indicated that variables such as bank size, total deposits, return on assets, and exchange rates had a positive impact on loans. In contrast, inflation and liquidity ratios were found to have a negative influence. Interestingly, GDP, Cash Reserve Ratio (CRR), and Capital Adequacy Ratio (CAR) showed a negative but statistically insignificant effect on lending behavior. The study recommends that banks prioritize these influential factors to enhance their lending performance and strategic planning.

Jessica and Chalid (2021) analyzed the impact of nonperforming loans (NPL) levels on bank lending behavior in Indonesia. The study also examined how variables like bank capitalization and market power influence this relationship. It considers macroeconomic factors within the Indonesian economic cycle. Data from conventional commercial banks in Indonesia, operating from 2007 to 2017, were used. Factors affecting credit growth include deposit growth, previous year's NPL ratio, bank capital adequacy ratio, Gross Domestic Product (GDP), real growth, and the Indonesian benchmark interest rate. The study found that credit risk, measured by the ratio of nonperforming loans to credit provided, is lower for banks with higher market power. Banks in the BUKU IV category were less affected by previous bad credit ratios compared to others. There were no significant differences in lending

behavior between government-owned and non-government-owned banks or between big banks and others.

Ali et al. (2016) conducted an in-depth analysis of internal factors affecting lending rates within Pakistan's commercial banking sector. They meticulously examined secondary data from nineteen major banks spanning the period of 2007 to 2014. The study honed in on seven specific variables unique to banks, aiming to understand their direct influence on lending behavior. Their findings were enlightening, showcasing that out of the seven variables studied, only four demonstrated a significant impact on lending rates. This research underscores the necessity of delving deeper into macroeconomic factors in future studies, highlighting potential avenues for further exploration and understanding within the banking sector.

Timsina (2016) explored the factors affecting commercial banks' lending behavior in Nepal through panel data from 24 banks spanning 1996 to 2015. Using descriptive statistics, correlation, and regression analysis, the study identified significant determinants such as assets, liquidity, open market operations (OMOs), and cash reserve ratio (CRR). OMOs and CRR were found to negatively impact lending, while the bank rate had a positive influence. The study recommends central banks prioritize OMOs and CRR in monetary policy for better liquidity management. Additionally, banks aiming to increase lending should focus on strengthening assets, capital, and liquidity reserves to handle liquidity crises efficiently.

Adzis et al. (2018) studied Malaysian commercial bank lending by analyzing bank-specific and macroeconomic variables, using data from 27 banks between 2005 and 2014. Their findings revealed that bank-specific factors such as size and deposit volume positively and significantly influence lending, while liquidity negatively impacts lending. The study found no significant effects from macroeconomic variables.

Tomok (2013) conducted a comprehensive analysis on the determinants influencing bank lending behavior in Turkey over a decade from 2003 to 2012. Using quarterly data from 15 private commercial banks and 3 state-owned banks, the study examined both bank-level factors (such as size and access to funds) and market-based variables

(including interest rates, inflation rates, and GDP). The empirical results highlighted the significant impact of bank size, total liabilities, nonperforming loans (NPL), and inflation rates on banks' business loans performance. Additionally, the study underscored the influence of ownership structure, indicating that private banks exhibited better loan performance compared to state-owned commercial banks.

Review of previous literatures reveal that number of studies has been done in the context of determinants of bank lending behavior.

However, in the context of Nepal no sufficient studies have been found. Therefore, the researcherhas tried to create the following research questions to meet the objectives of the study on determinants of lending behavior of commercial banks in Nepal.

i) What is the lending position of selected commercial banks in Nepal?
ii) Do any relationships exist between determinants of lending behavior such as CRR, CAR, IRS, TD and INF with dependent variable Loan and Advance of selected commercial banks in Nepal?
iii) How do determinants of lending behavior such as CRR, CAR, IRS, TD and INF impact on dependent variable Loan and Advance of selected commercial banks in Nepal?

1.3 Objectives of the study

To achieve this overarching objectives, this study has focused on several specific objectives including evaluating the impact of the cash reserve ratio, capital adequacy ratio, interest rate spread, total deposit and inflation on lending behavior. Moreover, this study has examined the relationship between dependent and independent variable of lending behavior of commercial banks in Nepal.

The main objectives of the study on determinants of lending behavior of commercial banks in Nepal are as follows:

i) To assess the lending position of selected commercial banks in Nepal.
ii) To examine the existence of relationships between determinants of lending behavior such as CRR, CAR, IRS, TD and INF with dependent variable Loan and Advance of selected commercial banks in Nepal.
iii) To analyze the impact of determinants of lending behavior such as CRR, CAR, IRS, TD and INF on the dependent variable Loan and Advance of selected commercial banks in Nepal.

1.4 Rationale of the study

The study on the determinants of lending behavior of commercial banks in Nepal holds significant value for various stakeholders. Policymakers and regulatory bodies in the banking sector can utilize the findings to develop effective policies and regulations, fostering an environment conducive to sustainable economic growth and financial stability. Commercial banks can benefit by optimizing their lending strategies and risk management practices, enhancing profitability and competitiveness. Researchers, academics, and students interested in Nepal's banking sector can use this study as a valuable reference contributing to the overall knowledge base in banking and finance. Moreover, the study's outcomes can provide insights for the business community, investors and individuals seeking loans, empowering them to make well-informed financial decisions based on credit availability, loan pricing and overall credit market dynamics.

1.5 Limitations of the study

These limitations provide context and scope for this study, acknowledging potential constraints while conducting research on the determinants of lending behavior in Nepalese commercial banks. The limitations of this study are as follows:

i) Limited to five Nepalese commercial banks: Prabhu Bank Ltd., Nepal Investment Mega Bank Ltd., NMB Bank Ltd., NIC Asia Bank Ltd., and Kumari Bank Ltd., potentially limiting the representation of the broader banking sector.

ii) This study has covered past ten-year period data from FY 2013/14 to FY 2022/24.

iii) Focuses primarily on specific variables: Cash Reserve Ratio, Capital Adequacy Ratio, Interest Rate Spread, Total Deposit and Inflation, potentially overlooking other factors influencing lending behavior.

iv) Relies on secondary data sources like bank annual reports and documents, which may have limitations in data accuracy and completeness.

CHAPTER – II
LITERATURE REVIEW

The purpose of this chapter is to review existing research in the chosen field and develop ideas for a research design. Previous studies are crucial as they lay the foundation for the current study, ensuring continuity in research. This connection is established by linking the present study with past research. To achieve this, various books, journals, and articles related to the topic have been reviewed. The review is organized into conceptual, theoretical and empirical sections.

2.1 Conceptual review

A conceptual review summarizes and analyzes theoretical ideas and frameworks related to a specific topic, offering insights into existing knowledge and areas for further exploration. The conceptual review for "Determinants of lending behavior of top commercial banks in Nepal" involves understanding the concept of commercial banks and defining bank lending.

Meaning and functions of commercial banks

Commercial banks are vital financial intermediaries that aggregate the savings of individuals and businesses within the community to support productive endeavors. These funds are then utilized for various purposes, such as providing loans to businesses for expansion, funding projects, or supporting economic activities.

One of the key functions of commercial banks is to accept deposits from the public, typically repayable on demand or with short notice, enabling depositor easy access to their funds. This deposit-taking activity is a significant aspect of a bank's operations and contributes significantly to its lending capacity.

Commercial banks operate by acquiring funds from depositors or shareholders and then lending these funds to borrowers who need capital for different purposes. The sources of capital for banks can vary; some banks rely more on shareholder investments, while others depend heavily on customer deposits.

Regarding lending, commercial banks serve diverse sectors. Some specialize in lending to industries, providing financial support for business operations, investments,

and expansions. Others focus on lending to government entities, both at the central and local levels, to finance public projects and initiatives.

Moreover, commercial banks offer loans with varying durations. Some provide short-term loans, typically repayable within a year, while others offer long-term financing extending over several years. This loan diversity enables banks to meet the diverse needs of borrowers across industries and sectors.

A crucial economic function of commercial banks is to hold demand deposits and honor checks drawn against these deposits. This activity forms the core of the money supply within an economy, facilitating transactions and economic activities.

Furthermore, commercial banks play a critical role in monitoring and reflecting economic trends. The volume and nature of their transactions provide insights into the economic health of a country, indicating shifts in economic activity and investment trends.

In summary, commercial banks play a pivotal role in economic development by channeling funds into productive activities, supporting trade and industry, fostering entrepreneurship through loans and investments, and contributing to economic growth and stability.

Some major functions of commercial banks are as follows:

a. **Financial Intermediation:** Commercial banks act as intermediaries, facilitating the flow of funds from savers to borrowers for various purposes such as business expansion, investments, and projects.
b. **Deposit Acceptance:** Banks provide a secure platform for individuals, businesses, and institutions to deposit their money, offering interest or other benefits on these deposits.
c. **Lending:** Banks extend loans to individuals, businesses, and government entities for purposes like purchasing homes, funding business operations, and infrastructure development.
d. **Check and Payment Services:** Banks offer services such as check clearing, electronic transfers, and payment processing, ensuring efficient and secure financial transactions.
e. **Credit Creation:** Banks create credit by lending out more money than they hold in deposits, stimulating economic activity and growth.
f. **Risk Management:** Banks manage various risks like credit risk, interest rate risk, and liquidity risk to maintain operational stability and sustainability.

g. **Investment:** Banks invest in securities, bonds, and other financial instruments to generate additional revenue and manage their balance sheets effectively.
h. **Financial Advisory Services:** Many commercial banks provide financial advisory services, offering guidance on investments, retirement planning, and wealth management to individuals and businesses.
i. **Foreign Exchange Services:** Banks facilitate foreign exchange transactions, enabling businesses and individuals to engage in international trade and investments.
j. **Economic Indicator:** Commercial banks' activities and performance serve as economic indicators, reflecting the overall health and trends of the economy.

Meaning of bank lending

Lending forms a significant part of bank's daily operations, representing their primary activity of issuing loans. However, it also presents a notable risk to banks as it can impact their security and stability (Yitayaw, 2021). A financial institution plays a crucial role in facilitating money transactions through various services like accepting deposits, disbursing loans, and providing financial assistance. The majority of funding for bank lending in Nepal, around 94%, comes from corporate and public deposits, while the remaining 6% is from shareholder ownership. These banks manage deposits from individuals, government-related entities, and businesses, using their lending and investment activities to support those in need, including individuals, businesses, and government institutions. Their primary objective is to generate credit using borrowed funds, and as private sector credit grows, commercial banks become key drivers of economic activity (Olokoyo, 2011).

Some major objectives of bank lending are follows:

a. **Profit Generation:** Banks lend money to earn interest income, which contributes to their profitability.
b. **Risk Management:** Banks aim to manage lending risks effectively by evaluating creditworthiness, setting appropriate loan terms, and diversifying their loan portfolios.
c. **Supporting Economic Growth:** Bank's lending fuels economic activities by providing individuals and businesses with access to capital for investments, consumption, and business expansion.

d. **Meeting Customer Needs:** Banks offer various loan products tailored to meet the diverse financial needs of individuals, businesses, and other entities.
e. **Fulfilling Regulatory Requirements:** Banks must comply with regulatory guidelines and standards related to lending practices, ensuring transparency, fairness, and stability in the financial system.
f. **Building Customer Relationships:** Lending activities help banks build long-term relationships with customers, fostering trust and loyalty.

2.2 Theoretical review

The theoretical review for the thesis on determinants of lending behavior of top commercial banks in Nepal involves examining related theories that will provide a foundation for understanding the relationships between financial determinants and lending decisions.

Theories of bank lending

In this section, the researcher examines and investigates the fundamental theories of lending. These theories offer a deeper understanding of how banks engage in lending activities, even though the specific methods may vary across banks. The some lending theories are as follows:

Credit creation theory

While many textbooks extensively cover the money multiplier theory of credit creation, there is relatively little emphasis in academic literature on the credit creation theory of banking. However, a recent paper by the Bank of England acknowledges the credit creation theory of banking as a valuable framework for comprehending the money creation process (McLeay et al., 2014).

Theory of multiple lending

In literature, it is suggested that banks may show less interest in loan syndication when equity markets are well-developed and after undergoing a consolidation process. The presence of external equity and mergers and acquisitions can enhance banks' lending capabilities, leading to reduced reliance on diversification and monitoring through loan syndication (Ongene & Smith, 2000). This theory holds

significant implications for banks in Nigeria, especially in the context of the industry's consolidation exercise in 2005.

Information asymmetry theory

A significant body of literature has highlighted the presence of asymmetric information as a fundamental characteristic of credit markets. Lenders extending credit to borrowers encounter uncertainties regarding the borrowers' creditworthiness, especially when certain borrower attributes and behaviors are not directly observable. These information imbalances often result in credit rationing equilibrium (Stiglitz and Weiss, 1981) and can undermine traditional competitive market outcomes (Broecker, 1990). However, over time, lenders tend to mitigate some of these informational challenges. Through the lending process, financial intermediaries can gather proprietary information regarding borrower creditworthiness, thereby gaining a degree of informational advantage over their clients and consequently exerting market power. As creditworthy borrowers struggle to signal their quality to rival lenders, they often find themselves bound in a long-term bank-client relationship, leading to interest rates that exceed the competitive level.

Financial intermediation theory

De Servigny et al. (2004) described the financial intermediation theory to explain how banks function in the economy through three key roles: liquidity intermediation, risk intermediation, and information intermediation. Liquidity intermediation involves banks reallocating surplus money from depositors to borrowers who need funds for investments. Risk intermediation refers to banks collecting various risks like credit, interest rate, and currency exchange risks then restructuring them into different securities with varying risk levels. Information intermediation focuses on banks balancing the information gap between well-informed entrepreneurs presenting investment projects and less-informed savers, ensuring efficient allocation of funds despite information disparities. These functions highlight the essential role banks play in facilitating economic activities and managing risks in the financial system.

Money creation theory

Credit money is created through loan extensions backed by central bank money, according to the credit creation theory. This theory emphasizes that credit money

originates from the loan promise, not from the actual lending of central bank money. When loans are repaid with interest, the credit money is eliminated, but reserves equal to the interest are generated as profit. Commercial banks provide credit lines as promises to grant loans, which are not considered money for regulatory purposes and require no reserves. However, when loans are granted from these credit lines, genuine credit money is created, necessitating reserves to match it. This theory challenges the mainstream model's assumption that loans are supported by existing reserves (Haslag & Young, 1998).

Loan pricing theory

Banks face challenges when setting interest rates to maximize interest income, as they must also consider adverse selection and moral hazard issues. Adverse selection arises because banks find it hard to predict the risk profile of borrowers at the beginning of their relationship (Stiglitz and Weiss, 1981). If banks set interest rates too high, they may attract high-risk borrowers, leading to adverse selection problems. The borrowers, after receiving loans, may exhibit moral hazard behavior by engaging in excessively risky projects or investments. This situation, known as borrower moral hazard, can occur when borrowers take advantage of the high-interest rates offered by banks. (Stiglitz and Weiss, 1981) suggest that sometimes banks may set interest rates that do not accurately reflect the risk posed by borrowers.

2.3 Empirical review

Ghimire and Bhandari (2023) examined the factors that affecting of lending interest rates of commercial banks in Nepal using descriptive and causal comparative research design. They discovered that factors like operating cost to total assets (OCTA), deposit interest rates (DIR), profitability (ROA), and default risk play a significant role in determining these rates. Due to challenges with liquidity in Nepal's banking sector, interest rates tend to change frequently, affecting investors, institutions, and academics in the country. The study recommends giving more attention to default risk when deciding on interest rates. It also suggests further research using a larger sample of banks and data over a longer period to better understand other factors affecting loan interest rates (LIR).

Chhetri (2023) examined the determinants of lending behavior of commercial banks in Nepal using descriptive and causal comparative research design. Researcher analyzed panel data from 2011/12 to 2020/21. The results showed significant impacts on loans and advances from factors such as bank size, liquidity, capital adequacy ratio, total deposits, lending rates and inflation. However, the gross domestic product growth rate had no significant impact. The study emphasized the importance of bank size, capital adequacy ratio, and total deposits in influencing lending behavior. To enhance lending, commercial banks should focus on attracting more deposits through improved customer service, a wider range of financial services, branch expansion, and innovative banking technologies. Closer cooperation between banks and regulatory authorities is also recommended, particularly in policy formulation regarding sector-specific regulations affecting bank lending. This ensures economic management and financial sector stability.

Choudhury and Amir (2023) studied the impact of non-performing loans (NPLs) on bank lending behavior in Bangladesh before and during the COVID-19 pandemic. They had used descriptive research design. They analyzed data from fifteen private commercial banks from 2012 to 2021. Credit growth was the main focus as the dependent variable, with independent variables including NPLs to total loans, provision for loan losses, GDP rate, inflation rate, unemployment rate, total loans to customer deposits, total equity to assets, tier 1 ratio, deposit growth and dummy variables for COVID-19 effects on NPLs. The study found that NPLs, provision for loan losses, total equity to assets, and COVID-19 effects were negatively correlated with credit growth. Conversely, total loans to deposits, deposit growth, and inflation were positively correlated. Recommendations included improving corporate governance, rigorous loan reviews, thorough KYC checks, safety protocols, collateral assessment, adherence to lending principles, and avoidance of risky lending practices.

Wang (2023) analyzed blockchain and its impact on bank lending behavior, recognizing the transformative influence of blockchain technology on the global financial sector by using causal comparative research design. The rapid adoption of blockchain in finance reshaped traditional banking operations, presenting both unprecedented opportunities and challenges for commercial banks' credit activities. This research carries important policy implications. Regulatory bodies are advised to

embrace blockchain's benefits, foster financial innovation, and provide robust support to banks leveraging blockchain technology. Moreover, countries transitioning to market-driven interest rates are urged to prioritize financial system reforms, encourage the integration of blockchain in traditional financial services, and enhance financial offerings to benefit the real economy. However, certain areas require further exploration. Firstly, the theoretical model lacked dynamism by not incorporating banks' present and future decisions. Secondly, environmental considerations like supply chain analysis were omitted from the model, warranting inclusion for a comprehensive analysis. Lastly, future qualitative analysis is recommended to validate the theoretical model, contingent upon data availability.

Niroula and Gnawali (2023) identified the factors that impact lending interest rates in commercial banks in Nepal using causal descriptive and comparative research design. The study focused on six independent variables: liquidity ratio, deposit interest rate, return on assets (ROA), default risk (DR), gross domestic product (GDP), and inflation. Data were collected from seven commercial banks between 2018 and 2022 through annual reports, and analysis was performed using correlation analysis and the ordinary least squares method. The results indicated that deposit interest rates, ROA, and inflation had a positive and significant influence on lending interest rates. However, GDP showed an insignificant negative effect, while liquidity ratio (LR) and default risk (DR) had an insignificant positive impact on lending interest rates. Consequently, the study concludes that essential independent variables such as deposit interest rates, return on assets and inflation play a significant role in determining the lending interest rates of Nepalese banks.

Sapkota and Bhattarai (2023) investigated the factors influencing lending decisions in commercial banks in Nepal. This study has used mainly descriptive research design and secondary data base. The study uncovered various factors that are closely linked to the lending behavior of commercial banks in the country. It was observed that an increase in the interest rate spread and bank size was associated with higher lending activities, whereas higher GDP and inflation rates were linked to decrease lending. On the other hand, the exchange rate exhibited a positive correlation with lending behavior, while the cash reserve ratio showed a relatively minor impact. Based on these findings, the study recommends that commercial banks in Nepal take into

account factors such as interest rate spread, bank size, exchange rate fluctuations, and risk profiles when making lending decisions. Additionally, it suggests implementing innovative lending strategies, adopting capital growth initiatives to enhance capital conservation, and maintaining balanced loan pricing to cover expenses while fostering positive borrower relationships.

Shrestha (2023) analyzed the specific factors influencing the Capital Adequacy Ratio (CAR) of Joint Venture Commercial Banks in Nepal through Panel Data Analysis also used descriptive and causal comparative research design. The study found specific factors impacting the CAR of Nepal's joint venture commercial banks, including Return on Equity (ROE), Loan to Asset Ratio (LTA), Loan to Deposit Ratio (LTD), Management Efficiency (ME), Operating Efficiency (OE), and Bank Size (SIZE). The study found that bank-specific factors significantly affect the CAR of Nepalese joint venture commercial banks. Particularly, it noted that the lending strategy (LTA) and financial performance (ROE) play contrasting roles in determining CAR. The study recommended that Nepalese joint venture commercial banks prioritize maintaining a higher CAR while managing lower ROE and LTA. Furthermore, the study concluded that factors such as liquidity (LTD), management efficiency (ME), operational efficiency (OE), and bank size (SIZE) positively impact CAR determination. Therefore, joint venture commercial banks in Nepal with better liquidity, efficiency, and larger size can maintain a lower CAR. The study's findings are valuable for bank management in ensuring sufficient CAR levels. Additionally, the study's results can inform policy-making for the central bank and regulatory bodies regarding capital requirements for commercial banks in Nepal.

Ikpuse and Oke (2022) examined the effect of capital adequacy and asset quality on banking sector performance in Nigeria using annual panel data in the period 2010 to 2019 using descriptive research design as well as financial tools. They discovered a positive relationship between capital adequacy and bank performance in Nigeria, as well as a positive influence of asset quality on performance. The study underscores the importance of ongoing improvements in asset quality by bank management to reduce non-performing loans. This involves analyzing the "Cs of credit" (capital, character, capacity, collateral, and condition) in line with loan requests and the business environment. The study also highlights the significance of fostering a sound

credit culture, implementing robust policies, and ensuring effective corporate governance to mitigate non-performing loans that could threaten banks' viability. Regulatory authorities play a vital role in maintaining banks' stability by strengthening capital requirements and monitoring lending behavior to prevent excessive risk-taking. Strengthening the regulatory framework not only promotes competition among banks but also equips them to compete effectively on a global scale.

Dulan (2022) analyzed Ways of Improving Personal Lending Practices in Commercial Banks using descriptive and causal comparative research design. The conclusion and suggestions of this article highlight that the primary objective of managing the credit portfolio of commercial banks is to achieve optimal levels of risk, profitability, and liquidity indicators. Effective management of the loan portfolio in commercial banks involves constant and effective monitoring of asset quality, strengthening mechanisms for identifying and addressing problematic situations related to bank assets at early stages, and implementing measures for effective risk management through asset diversification and adjustments based on economic conditions. Furthermore, it emphasizes the importance of assessing, studying, and analyzing risks that may arise in the lending process, aligning decisions with regulatory documents, monitoring business plan indicators, developing new methods for managing problem loans, and ensuring the quality of assets. It's crucial to maintain a high share of good loans in the portfolio (at least 90%), minimize overdue loans, and ensure compliance with the approved credit policy in terms of sectors, regions, and maturity. Continuous monitoring of compliance with the bank's credit policy and lending principles is essential for successful loan portfolio management.

Shrestha (2022) identified significant factors affecting the interest spread rates using descriptive and causal comparative research design with including bank-specific elements like return on assets (ROA), credit risk (CR), management efficiency (ME), and operational efficiency (OE), as well as macroeconomic factors like inflation and GDP growth rate. However, no significant relationship was found between the capital adequacy ratio (CAR) or asset quality and the IRS. These findings are crucial for policymakers to formulate effective interest rate policies. They underscore the

importance of managing credit risk, enhancing efficiency, and controlling inflation to maintain lower IRS levels in Nepalese commercial banks.

Makanile and Pastory (2022) analyzed the determinants of lending behavior of commercial banks in Tanzania using descriptive, causal comparative, financial and statistics tools with focusing on factors like liquidity, interest rates, capital adequacy, and management efficiency. The research found a significant relationship between liquidity and bank lending, emphasizing its importance. However, interest rates and management efficiency showed insignificant effects on lending. The study recommended prioritizing liquidity, developing effective policies for bank growth, and adopting innovative lending strategies tailored to sector risk profiles. Additionally, it suggested implementing capital growth strategies to enhance banks' resilience during stressful periods.

Malik (2022) investigated the impact of various monetary policy tools used by the State Bank of Pakistan on the lending behavior of commercial banks. The study has used descriptive research design with calculating financial tools. This study revealed a significant relationship between changes in the deposit base, referred to as Broad Money, and the extension of private credit, aligning with the theoretical framework proposed by Tobin (1965). Moreover, the study uncovered that monetary policy shocks exerted a notable influence on the leverage of private sector lending. This finding underscores the critical role of credit as a transmission mechanism for monetary policy in Pakistan, urging monetary authorities in developing countries to prioritize credit management in their policy frameworks. The research also highlighted the importance of changes in the deposit base within conventional banks as a key determinant of monetary policy effectiveness, particularly over the long term. This emphasizes the need for continuous monitoring and adaptation of policy tools to ensure stability and efficiency in the banking sector.

Semu and Ndanshau (2022) determined the impact of monetary policy actions on the lending behavior of commercial banks in Tanzania before the adoption of the interest rate targeting regime in 2017:III. Quarterly panel data from twenty-seven commercial banks in Tanzania for the period 2012:I - 2017:II were analyzed using the Arellano-Bond Generalized Method of Moments (GMM) estimation technique. The one-step

difference GMM results indicated that lagged lending, reserve ratio, the interaction term of reserve ratio and lagged bank size, the interaction term of discount rate and lagged capitalization, and the interaction term of lagged discount rate and lagged capitalization determined the lending behavior of commercial banks in Tanzania. Other variables in the model were statistically insignificant. This study has used descriptive and causal comparative research design. The findings highlighted the significant role of commercial banks in Tanzania in transmitting monetary policy actions to the real sector through credit to the private sector. Specifically, the central bank in Tanzania could regulate the financial sector by adjusting the reserve ratio and discount rate to achieve the desired monetary policy. The study also noted that the effectiveness of the credit channel depended on bank characteristics, particularly the banks' size or capitalization. The impact of the discount rate on commercial banks' lending behavior was significant due to capitalization, though weaker compared to the impact of the reserve ratio. Further empirical studies are needed to qualify these findings regarding the monetary policy effect on commercial banks' lending behavior in Tanzania.

Msomi (2022) examined the factors affecting non-performing loans (NPLs) in commercial banks across selected West African countries using descriptive research design. The study identified Loan-to-Deposit Ratio (LDR) and Gross Domestic Product (GDP) as the only variables negatively influencing NPLs, while others had a positive impact. The significant determinants of NPLs were found to be the capital adequacy ratio, liquidity, and inflation rate. To mitigate NPLs, banks should maintain optimal capital ratios, enforce strict loan management practices, and manage inflation for economic stability. Further research is recommended to include data from all commercial banks in the region to fully understand the impact of NPLs on the banking sector and the economy.

Yitayaw (2021) examined the firm-specific, industry-specific, and macroeconomic factors influencing commercial banks' lending in Ethiopia through panel data analysis using descriptive and quantitative research method. The study utilized data from 15 commercial banks spanning 2011 to 2019, employing a quantitative approach and explanatory design with secondary data from audited financial statements. Results indicated that factors such as deposit volumes, capital adequacy, and bank size

positively impacted lending, while cash reserve requirements, bank concentration, and average lending rates had adverse effects. Furthermore, gross domestic product negatively influenced bank lending.

Bangura et al. (2021) analyzed the Bank Lending Channel of Monetary Policy in Sierra Leone using dynamic panel data from 2014-2018. In this study, the researcher has used descriptive and causal comparative research. The descriptive research design has used to analyze lending channel and their influencing factors, while the causal comparative research design has used to explore relationship between the dependent and the independent variables. They employed the Generalized Method of Moments (GMM) procedure to investigate how changes in monetary policy affect bank lending behavior and the role of bank-level characteristics like size, liquidity, and capital in this process. The study found that the monetary policy rate has a significant negative impact on banks' loan supply, indicating the presence of a bank lending channel in Sierra Leone. Larger banks were less sensitive to monetary policy changes compared to smaller banks, supporting the bank lending channel theory. Factors such as past loan supply, economic activity (Real GDP), and inflation also influenced commercial banks' loan supply. However, liquidity and bank capital did not influence loan supply, suggesting they are not sources of asymmetric response to monetary policy. The study's policy implications include the importance of monitoring individual bank characteristics, particularly size, to enhance the effectiveness of monetary policy in Sierra Leone's real sector.

Bhuiyan (2021) examined the Determinants of Commercial Bank Lending Rates in Bangladesh. The descriptive research design has been used to analyze lending rate and their influencing factors. The study revealed that the deposit rate and the ratio of non-performing loans to total loans significantly impact lending rate determination in Bangladesh, both in the short and long run. The analysis utilized data from fiscal year 1997-98 to 2018-19, while controlling for the money supply to GDP ratio. For instance, a 1 percentage point increase in the deposit rate led to a 1.32 percentage point increase in the lending rate in the long run, which was statistically significant at the 1% level. Similarly, a 1 percent increase in the net ratio of non-performing loans to total loans resulted in a 0.21 percentage point increase in the long-run lending rate, which was significant at the 10% level. Furthermore, the study highlighted the lasting

impact of the profitability ratio on lending rate determination in Bangladesh. While the deposit rate influenced the lending rate in both the short and long runs, the ratio of non-performing loans to total loans affected the lending rate only in the long run within the banking sector. In summary, the determinants of commercial banks' lending rates in Bangladesh include the deposit rate, profitability ratio, and the net ratio of non-performing loans to total loans. These findings are valuable for the Central Bank of Bangladesh, commercial banks, policymakers, and the government in formulating effective lending rate policies to promote investment and sustainable economic growth in the country.

Goet (2021) examined the interplay of bank-specific and macroeconomic variables, including Total Deposit (LNTD), Cash Reserve Ratio (CRR), Interest Spread Rate (ISR), and Inflation Rate (IR), on Loan and Advances (LNLA) among joint venture banks in Nepal by using co-relational and causal research design. Analyzing secondary panel data from four out of seven joint venture banks over a seven-year period, the study discovered significant correlations and impacts. Notably, a positive correlation was found between LNLA and LNTD, indicating the positive influence of higher total deposits on lending activities. Conversely, LNLA exhibited a significant negative correlation with IR, highlighting the impact of inflation rates on lending behavior. While LNTD and IR were identified as significant influencers of LNLA, CRR and ISR did not demonstrate significant effects on lending patterns. These findings offer crucial insights into the dynamics of lending behaviors within Nepal's banking sector, informing future research directions and strategic decision-making processes.

Arintoko (2021) studied the symmetric and asymmetric effects of internal factors on bank lending, measured by the loan-to-deposit ratio (LDR). The descriptive and causal comparative research design has used in this study to indentify influencing factors. The analysis model utilizes the Autoregressive Distributed Lag (ARDL) and nonlinear ARDL models. The data analyzed are monthly time series covering the period from January 2012 to June 2020. This research contributes by providing empirical evidence of the asymmetric effect of internal bank performance on bank lending using macro-level data. The results indicate that non-performing loans (NPL) consistently and robustly have a negative effect on bank lending in both the short and

long run, symmetrically and asymmetrically. The capital adequacy ratio (CAR) positively affects bank lending when it decreases in the long run. Operating expenses to operating income (OEOI) have a negative effect only in the short run, assuming symmetric and asymmetric effects. The liquid assets ratio (LAR) negatively affects bank lending when it increases, both in the short and long run. The banking supervisory agency needs to consistently supervise and enforce regulations effectively related to bank soundness, especially those concerning reducing non-performing loans, strengthening the capital structure, and improving efficiency.

Bhattarai (2020) identified key influencers of lending behavior in Nepal using causal comparative and descriptive research design that are: strong investment portfolios, optimal cash reserve ratios, and the size of the bank, all positively impacting loan approvals. Conversely, liquidity levels showed a negative correlation. Intriguingly, macroeconomic variables like GDP growth and inflation rates had little bearing on loan determinants. The study's takeaway for banks was clear: considering these internal factors is crucial for prudent loan approvals.

Berhe (2020) researched the determinants of commercial banks' lending behavior in Ethiopia, focusing on selected commercial banks using Descriptive as well as cross sectional explanatory research design. The study found that loans and advances accounted for approximately 44.7% of these banks' assets, with an average credit rate of 14%. Capital covered around 12.5% of their asset size, while provisions for loans and advances were about 1.8% of total loans. Additionally, deposits were roughly 7.154 times their capital. The correlation analysis revealed a significant positive relationship between the liquidity ratio and lending behavior, whereas credit/interest rates showed a negative and significant correlation. The capital adequacy ratio, asset quality ratio, and deposit volume exhibited negative but insignificant relationships with lending behavior. These findings suggest that various factors play a role in commercial banks' lending behavior, with the liquidity ratio having a particularly significant impact. The study's regression analysis confirmed the significant effects of the liquidity ratio, credit rate, and asset quality ratio on lending behavior. However, the capital adequacy ratio and deposit volume had negligible effects. In conclusion, the study emphasizes the importance of liquidity management in lending decisions and sheds light on the influence of interest rates on borrowing behaviors.

Alsaket and Ekski (2020) conducted an in-depth analysis of the internal and external determinants affecting bank credit across all private commercial banks operating in Turkey. Their study, employing a descriptive research design alongside quantitative tools, focused on the pivotal role that banking credit plays in driving economic growth, given its substantial impact on the overall economy. With private commercial banks being key players in Turkey's banking system in terms of total deposits and assets, the research aimed to pinpoint the factors influencing the lending behavior of these institutions. By examining data from nine banks over the period from 2010 to 2017, with quarterly data for each bank, the study unearthed crucial insights. Notably, it revealed an inverse correlation between the inflation rate and private sector credit within private commercial banks. On the other hand, factors such as liquidity levels, deposit volumes, gross domestic product size, and interest rates exhibited positive relationships with loan approval rates. However, the study did not find a significant impact of bank size on loan approval rates. These findings underscore the importance for regulatory institutions to closely monitor these variables to create an environment conducive to increased lending by banks, thereby contributing significantly to economic growth and stability in Turkey.

Ogu et al. (2020) analyzed the relationship between commercial banks' loans and lending rates in Nigeria from 1981 to 2016 using the Toda-Yamamoto Causality Approach. Key findings revealed non-stationarity of series (first-order integration), co-integration evidence indicating a long-term relationship between lending rates and bank loans, and strong one-way causality from lending rates to bank loans and from the monetary policy rate to lending rates in Nigeria. This study has used to descriptive research design. The main findings are (a) The ADF results show that the series are non stationary in their level form and are integrated of order one. (b) Johansen co-integration test result shows evidence of cointegration implying a long run relationship between lending rate and banks loan in Nigeria. (c) The TodaYamamoto causality test indicates a strong unidirectional causality running from lending rate to banks loan and from monetary policy rate to lending rate in Nigeria The study recommends maintaining stable monetary policy rates to positively impact lending rates, thereby enhancing access to loans for investors and promoting investment, productivity, and employment growth in Nigeria.

Adhikari and Jha (2020) conducted a comprehensive analysis of the product-wise lending practices and behaviors of Siddhartha Bank Limited (SBL) and Sunrise Bank Limited (SRBL). Their study delved into the intricate policies and strategies adopted by these banks regarding loans and advances offered to a diverse range of clients, including individuals, organizations, and institutions. Over a period of five years, the study meticulously tracked and analyzed trends in key financial indicators such as deposits, loans, advances, borrowings, and net profits for both SBL and SRBL. Moreover, the research critically evaluated the lending practices of these banks, aligning them with the regulatory guidelines set forth by the Nepal Rastra Bank (NRB). Utilizing a combination of secondary data sources and insightful interviews with personnel from SBL and SRBL, the study garnered valuable perspectives on the lending landscape within these financial institutions. Data analysis, including the examination of deposit trends, loan disbursements, borrowings, and investment patterns, was conducted using advanced statistical techniques facilitated by the SPSS tool. The application of regression models yielded a plethora of results, offering a comprehensive understanding of the lending dynamics and financial performance of both SBL and SRBL during the specified period.

Bhattarai (2020) conducted a thorough analysis of the factors influencing the Capital Adequacy Ratio (CAR) in Nepalese commercial banks. The study utilized secondary balance panel data from 11 banks over the period 2013/14 to 2017/18, with 55 observations obtained through convenience sampling. Using descriptive, co-relational, and causal-comparative designs, the research analyzed variables such as credit risk, asset quality, management efficiency, return on assets, liquidity, bank size, and macroeconomic factors like GDP growth rate and inflation. Three models, including Pooled OLS, Fixed Effects, and Random Effects, were employed for data analysis. The findings indicated a positive impact of liquidity on CAR, while bank size and inflation had negative effects. However, variables such as profitability, asset quality, credit risk, management efficiency, and GDP growth rate did not significantly influence CAR. In conclusion, the study identified liquidity, bank size, and inflation as the primary determinants affecting CAR in Nepalese commercial banks, highlighting the complex interplay of financial and macroeconomic factors in bank capital management.

Table 1

Summary of Empirical Review

Authors	Objectives	Variables	Methodology	Findings
Ghimire and Bhandari (2023)	To examine the factors that affecting commercial bank's lending rates in Nepal.	**Dependent**: Lending interest rate **Independent**: OCTA, Deposit interest rate, Profitability and Default risk	Descriptive and Causal comparative	The study recommends giving more attention to default risk when deciding on interest rates. It also suggests further research using a larger sample of banks and data over a longer period to better understand other factors affecting loan interest rates (LIR).
Chhetri (2023)	To examine the determinants of lending behavior of commercial banks in Nepal.	**Dependent** : Loan and advance **Independent**: Size of bank, Liquidity ratio, Capital adequacy, Total deposit, Lending rate, GDP and Inflation rate	Descriptive and Causal comparative	The finding of the study concluded that bank size, capital adequacy ratio, total deposit, have a positive and statistically significant effect on loan and advances. Likewise, Liquidity ratio, lending rate and inflation have a negative and statistically significant effect on Loan and advances.
Amir and Choudhary (2023)	To investigate non-performing loans, whether there are any changes in bank lending behavior, and the impact of the covid-19 in Bangladesh.	**Dependent**: Bank Behavior (credit Growth) **Independent**: Non-performing loans to total loans Provision for loan losses to total loans	Descriptive	Main reason for non-performing loans and the consequences are it reduces the liquidity, profitability, capital, inverse impact of the economy, and credit growth.
Wang (2023)	To examine the dynamic impact of blockchain on the lending behavior of commercial banks.	Required reserve, Loan, Deposit and Capital	Causal comparative	This research carries important policy implications. Regulatory bodies are advised to embrace blockchain's benefits, foster financial innovation, and provide robust support to banks leveraging blockchain technology.
Niroula and Gnawali (2023)	The research aimed to identify the factors that impact lending interest rates in commercial banks in Nepal.	**Dependent** variable: Lending rate **Independent** variable: Liquidity, DIR, ROA, Default risk, GDP and Inflation	Descriptive and Causal comparative	The conclusion of this study is, that the main independent variables like deposit interest rate, return on assets and inflation have positive and significant effects on the lending interest rate of Nepalese banks.

Sapkota and Bhattarai (2023)	This study aims to identify the factors that influence the lending behavior of commercial banks in Nepal.	**Dependent** variable: Loan and advance **Independent** variable: Bank size, Interest spread rate, Cash reserve ratio, GDP growth rate, Inflation and Exchange	Secondary data	Based on these findings, the researcher recommended that policies should be developed to support the growth of commercial banks and encourage lending, with a focus on improving interest rate spreads and increasing the size of banks.
Shrestha (2023)	This study aims to identify the factors determining the CAR of commercial banks in Nepal.	**Dependent**: capital adequacy ratio **Independent**: Return on equity, Lending policy, Liquidity, Management efficiency, Operational efficiency and Bank size	Descriptive and Causal comparative	The finding of this study can also be implemented by the regulatory bodies to develop policies relating to the capital requirements of commercial banks.
Ikpuse and Oke (2022)	The purpose of this paper is to examine the effect of capital adequacy and asset quality on banking sector performance in Nigeria using annual panel data in the period 2010 to 2019.	**Dependent**: Return on equity **Independent**: Capital adequacy ratio, Non-performing loan, Loan loss provision ,Firm size, Revenue growth and Inflation	Descriptive – financial tools	The findings of the study indicate that adequate capital and sound asset quality translate to improved earnings and performance of the banks.
Dulan (2022)	To analyzes the practice of lending to individuals by commercial banks.	Lending, Bank, Personal, liquidity, Central bank, Loan portfolio management, Risk, profitability and Liquidity	Descriptive Causal comparative	The conclusion and suggestions of this article highlight that the primary objective of managing the credit portfolio of commercial banks is to achieve optimal levels of risk, profitability, and liquidity indicators.
Shreshta (2022)	This study aims to determine the factors that affect Nepalese commercial bank's interest spread rate.	**Dependent**: Interest rate spread **Independent**: ROA, CAR, Management efficiency, Assets quality, Operational efficiency, Credit risk, Inflation and GDP	Descriptive and Causal comparative	The major conclusion of this study is that bank specific factors such as return on assets, credit risk, management efficiency and operational efficiency have a significant influence on IRS.

Makanil and Pastory (2022)	To assesses the determinants of the lending of six commercial banks in Tanzania from 2015 to 2019.	**Dependent**: Lending **Independent**: Liquidity, Interest rate, Capital adequacy and Management efficiency ratio	Descriptive-quantitative, financial and statistical	The results show that liquidity and capital adequacies have a significant relationship with lending, whereas interest rate and management efficiency have no statistically significant influence on lending
Malik (2022)	This paper aims to investigate the impact of various monetary policy tools used by the State Bank of Pakistan on the lending behavior of commercial banks.	**Dependent**: Private Credit by banks (taken as a %age of GDP) **Independent**: Monetary policy, Amount absorbed, Policy rate and Growth in broad money	Descriptive-financial	The estimated results show that private credit, monetary policy and policy rate are negatively skewed while OMOs (absorption) and growth in broad money are positively skewed. The results show that all the variables have positive kurtosis.
Semu and Ndanshu (2022)	To analyze the effects of monetary policy on lending behavior of commercial banks in Tanzania.	**Dependent**: Lending Independent: Reserve ratio, Discount rate, Bank size, Bank capitalization, Bank liquidity, Inflation, Real economic growth and, Interbank market rate	Descriptive and Causal comparative	The findings revealed the quantity-based monetary policy was stronger during the sample period but its effect was varied with the size and level capitalization of the banks.
Msomi (2022)	To examine the macro-economic and bank-specific factors affecting non-performing loans in commercial banks.	**Dependent**: Non-performing loans **Independent**: Lending rate, Capital adequacy ratio, Liquidity ratio, Cost income ratio, Inflation rate, Real interest rate and Gross domestic Product growth rate	Descriptive-statistical	From the analysis in this study, only LIR and GDP negatively affect NPLs, while other factors have a positive and significant effect on NPLs. It is therefore concluded that the determinants of NPLs in West African countries' commercial banks are capital adequacy ratio, liquidity and inflation rate, based on the fact that they are the only significant factors.
Yitayaw (2021)	To investigate the bank-specific, industry-specific and macroeconomic determinants of commercial banks' lending in Ethiopia.	**Dependent**: Lending rate **Independent**: Deposit, CA, ROA, Size, LIQ, CRR, BC, ALR, GDP and INF	Descriptive, quantitative	The study suggest that commercial banks in Ethiopia have to manage their lending by giving more attention to the internal factors, which the management has control over in line with the banking industry rules.

Bangura et al. (2021)	The purpose of this study is to investigate the presence of a bank lending channel of monetary policy in the Sierra Leone.	**Dependent**: Supply of bank loans **Independent**: Monetary policy rate, Gross domestic product, Inflation and Bank specific characteristics	Descriptive and Causal comparative	This paper attempts to find out whether bank's loan supply adjust to monetary policy shocks and whether bank's reaction to monetary policy differs depending on certain bank specific characteristics like size, liquidity and capitalization of a bank.
Bhuiyan (2021)	To focus on the determination of commercial bank lending rates in Bangladesh	**Dependent**: Lending rate **Independent**: DR, Per capita employment cost, Profitability, Non-performing loan, National saving interest, Money supply and GDP	Descriptive	The paper finds that deposit rate (DR) and ratio of non-performing loan (NPL) to total loans have both the short-run and long-run impact on commercial banks' lending rate determination when the sample period FY98- FY19 is considered.
Goet (2021)	To investigates lending determinants like bank specific and macroeconomic.	**Dependent**: Loan and advance **Independent**: CRR, ISR,INF Rate and Total	Co-relational , causal research design and secondary data panel	This study finds that is the significance and positive co-relational between LNLA and LNTD. LNLA has significant and negative co-relation with IR. In addition, LNDT and IR have significant impact on LNLA but CRR and IRS do not give any significant influence on LNLA.
Arintoko (2021)	The purpose of this study is to estimate the symmetric and asymmetric effects of internal factors on bank lending measured by loan to deposit ratio (LDR).	**Dependent**: Bank lending **Independent**: Credit risk, Capital capacity, Efficiency of bank operations and Liquidity	Descriptive and Causal comparative, Secondary data	Finding, the estimation results of the nonlinear ARDL model found new evidence of the asymmetric effects of NPL, CAR, OEOI, and LAR on bank loans in the short run. Meanwhile, significant evidence of the asymmetric effect of NPLs on bank lending is also found in the long run.
Bhattarai (2020)	The purpose of the study to determine the commercial bank's lending in Nepal.	**Dependent** : Loan and advance **Independent**: Liquid assets, Investment portfolio, Cash reserve ratio, Bank size and GDP	Descriptive and Causal comparative	The concluded that liquidity, investment portfolio, cash reserve ratio and bank size were major determinants of loan and advance. The study recommended that the loan administration of every bank should check these variables before approved the loan and advance.

Behre (2020)	The main objective of the study is to examine the determinants of commercial bank's lending behavior for selected commercial bank in Ethiopia.	**Dependent** : Loan and advance **Independent**: Volume of deposit, Liquidity ratio, Capital adequacy ratio, Interest rate and Assets quality ratio	Descriptive, cross sectional explanatory research design	The study findings revealed that the bank's interest/credit rates, capital adequacy ratio, asset quality ratio and volume deposits have an inverse relationship with lending behavior of total loans advanced by commercial banks. For this case, high interest rates discourage borrowing and vice versa.
Alsaket and Ekski (2020)	To analyze of the internal and external determinants of bank credit by using data obtained From all private commercial banks operating in Turkey	**Dependent** : Credit rate **Independent**: Total deposits, Lending rate, Liquidity ratio, Size of the bank, GDP and Inflation rate	Descriptive (quantitative)	The results of the study showed that there was no effect between the size of the banks and granting of loans rate. It means that regulatory institutions should be careful these significantly variables for more bank lending.
Ogu et al. (2020)	To examine the causality between commercial banks loans and lending rate, to examine the causality between commercial banks loans and money supply, and to examine the causality between commercial banks loans and monetary policy rate	**Dependent**: Commercial bank's loan and advance **Independent**: Bank lending rate, Money supply and Monetary policy rate	Descriptive	The main findings are itemized below as follows: (a) The ADF results show that the series are non stationary in their level form and are integrated of order one. (b) Johansen co-integration test result shows evidence of cointegration implying a long run relationship between lending rate and banks loan in Nigeria. (c) The TodaYamamoto causality test indicates a strong unidirectional causality running from lending rate to banks loan and from monetary policy rate to lending rate in Nigeria
Adhikari and Jha (2020)	The main objective of this study is to find out the trend of deposit, loans and advances, borrowings and net profits of SBL and SRBL	**Dependent**: Lending behavior **Independent**: Deposit, Investment, Borrowings and Net profit	Descriptive	The most important function of the banks is to collect the deposits upon which lending activities rely on. So, for banks and financial institutions, it is very necessary to focus on the lending part and must be the major priorities.

Bhattarai (2020)	To determine the capital adequacy ratio of commercial banks in Nepal	**Dependent**: Capital adequacy ratio **Independent**: Credit risk ratio, Assets quality, Management quality, Return on assets, Liquidity, Bank size, Inflation and GDP	Descriptive, Secondary balance panel data.	The results of the study revealed that the liquidity has positive and statistically significant effects on capital adequacy ratio, Size of bank and inflation rate have negatively and statistically significant results. The others variables profitability, asset quality, credit risk, management quality and growth of gross domestic products does not effect to capital adequacy ratio.

2.4 Research gap

The research gap refers to differences between previous studies and the current research. This study covers a longer time period up to 2022/23 compared to earlier studies, which focused on older periods till 2020/21. Additionally, previous studies had used a maximum of 5 years, while this study covers 10 years. This study has used more financial and statistical tools. The researcher has classified independent variables into bank specific and macroeconomic. The bank specific independent variables are cash reserve ratio, capital adequacy ratio, interest rate spread and total deposit. In addition, the macroeconomic independent variable is inflation rate. Moreover, the dependent variable is loans and advances, whereas previous researchers had studied with no classification of variables. Top commercial banks has been specifically chosen for this study, including Prabhu Bank Limited, Nepal Investment Mega Bank Limited and NMB Bank Limited as they were awarded Bank of the Year in 2023, 2022 and 2021 respectively. NIC Asia Bank and Kumari Bank Limited were also selected for comparison. This study aims to effectively address the research gap.

CHAPTER – III
RESEARCH METHODOLOGY

The research methodology section of a research report explains the methods, tools, and technique used to analyze data and create the report. It involves careful investigation, especially in searching for new facts in any area of knowledge, to determine the appropriate research approach. Researcher will use the following methodology to achieve the study's objectives.

3.1 Research design

Research design is a plan of overall scheme or program of research. In this study, the descriptive and causal comparative research designs has been used by researcher in order to address issues related to bank lending determinants. The descriptive research design has utilized to analyze lending patterns and their influencing factors while the causal comparative research design has employed to explore the direction and strength of the relationship between the dependent variable (loan and advance) and the independent variables (cash reserve ratio, capital adequacy ratio, interest rate spread, total deposit and inflation).

3.2 Population and sampling, and sampling design

Currently, there are 20 commercial banks operating in Nepal as of March 13, 2024. They constitute the total population of banks. Among them only 5 commercial banks has been selected as sample. Initially, the researcher has chosen Prabhu Bank Limited, Nepal Investment Mega Bank Limited and NMB Bank Limited as sample banks because Prabhu Bank was awarded Bank of the Year in 2023, NIMB Bank in 2022 and NMB Bank in 2021. Additionally, the researcher has purposively selected NIC Asia Bank Limited and Kumari Bank Limited as additional sample banks for a comparative analysis and to study the determinants of lending behavior of top commercial banks in Nepal.

3.3 Nature and sources of data, and the instrument of data collection

This study relies on secondary data, which includes information that others have already collected, like annual reports, financial results from selected banks and

documents outlining bank's plans. It also looks at data from newspapers, magazines, economic journals, and reports from the Nepal Rastra Bank (NRB). By gathering all this information, the study aims to understand what determinants are influencing bank lending behavior of commercial bank in Nepal. This helps build a better understanding of banking practices and can guide smarter decisions in the banking industry.

3.4 Method of analysis

For the research aiming to understand the determinants of lending behavior among top commercial banks in Nepal, a combination of descriptive statistics and inferential statistics tools has been employed. Descriptive statistics has involved arithmetic mean, standard deviation and variance while inferential statistics has involved multiple correlation and multiple regression analyses.

Descriptive statistics

Descriptive statistics played a crucial role in analyzing key independent variables such as Cash Reserve Ratio (CRR), Capital Adequacy Ratio (CAR), Interest Rate Spread (IRS), Total Deposits (TD) and Inflation (INF) with the dependent variable being Loan and Advances. It provides insights into the average values, variability and distribution of these variables. This analysis help us understand how the data is spread out and what its characteristics are, which prepares us to look deeper into what influences lending behavior in Nepalese banks. Therefore, descriptive statistics are follows:

a) Arithmetic mean

The arithmetic mean, often referred to as the average, represents the central tendency in a dataset and is computed by adding all values together and dividing by the total count of values. This metric is widely utilized as a descriptive statistic.

$$\text{Arithmetic mean } (\bar{x}) = \frac{\sum x}{n}$$

Where,

n = Total number of values in the dataset

$\sum x$= Sum of all values in the dataset

b) Standard deviation

Standard deviation in descriptive statistics quantifies the dispersion or variability within a dataset, indicating how widely the values deviate from the mean. The method for computing standard deviation varies depending on whether the analysis involves a population or a sample.

$$\text{Standard deviation } (\sigma) = \sqrt{\frac{\sum(x-\bar{x})^2}{N-1}}$$

Where,

x Represents each individual data point in the dataset

$\bar{x}$ Represents the mean (average) of the dataset

N is the total number of data points in the dataset

c) Variance

In descriptive statistics, variance measures the spread or dispersion of a set of data points around the mean. It quantifies the average squared difference between each data point and the mean of the data set. The formula for variance (s^2) for a sample is:

$$\text{Variance } (s^2) = \frac{\sum(x-\bar{x})^2}{N-1}$$

Where,

x Represents each individual data point in the dataset

$\bar{x}$ Represents the mean (average) of the dataset

N is the total number of data points in the dataset

Inferential Statistics

Inferential statistics refer to the analytical techniques used to draw conclusions about the relationship between independent variables (such as Cash Reserve Ratio (CRR), Capital Adequacy Ratio (CAR), Interest Rate Spread (IRS), Total Deposits (TD) and Inflation Rate (INF)) and the dependent variable, Loans and Advances. These techniques have included correlation analysis and regression analysis which help to assess the strength and significance of the associations between the independent variables and the dependent variable, providing insights into the determinants influencing lending behavior in the Nepalese banking sector.

a) Correlation analysis

The correlation coefficient serves as a statistical measure for assessing the strength and direction of relationships among multiple variables. A positive correlation indicates that both variables move together, either increasing or decreasing. Conversely, a negative correlation suggests that as one variable increases, the other decreases. This coefficient ranges from +1 to -1, where +1 signifies a perfect positive correlation and -1 represents a perfect negative correlation. A +1 value means that changes in one variable predict changes in the other in the same direction, while a -1 value indicates changes in opposite directions. The study has applied Karl Pearson's correlation analysis method using SPSS version 29.

b) Multiple regression analysis

Multiple regression analysis involves quantifying the average relationship between two or more variables in their original data units. It is used for estimating or predicting one variable's value based on given values of other variables, where there are both dependent (response) and independent (predictor) variables. The regression coefficients ('β') in statistical analysis help in understanding how changes in predictor variables affect the response variable, indicating the degree of change in the response variable for a one-unit change in predictors.

Model specification

In this model the dependent variable is loan and advance, which is influenced by several independent variables. The model is represented as:

$LnLA = \alpha + \beta_1 CRR + \beta_2 CAR + \beta_3 IRS + \beta_4 LnTD + \beta_5 INF + \varepsilon it$

Where:

α = Intercept/ constant term

LnLA = Natural logarithm of loan and advance

CRR = Cash reserve ratio

CAR = Capital adequacy ratio

ISR = Interest spread rate

LnTD = Natural logarithm of the total deposit

INF= Inflation rate indicated by the economic survey

εit = error term of the stochastic model

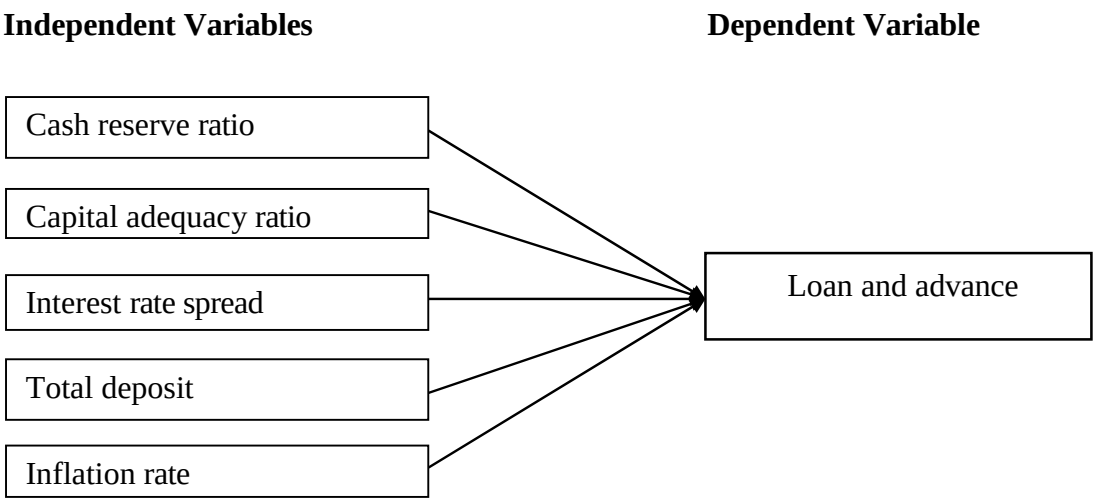
Betas (β) are the parameters of the model

3.5 Research framework and definition of variables

The research framework for studying the determinants of lending behavior in commercial banks in Nepal integrates theoretical concepts and empirical evidence from existing literature. It focuses on understanding the relationship between dependent variables, like loan and advance growth rate, and key independent variables such as the Cash Reserve Ratio (CRR), Capital Adequacy Ratio (CAR), Interest Rate Spread, Total Deposits and Inflation Rate. These variables are grounded in banking regulations, risk management theories, financial stability concepts, monetary policy considerations, and macroeconomic theories. By incorporating these elements, the framework provides a structured approach to analyzing lending behavior, offering insights into the dynamics of banking operations and financial factors influencing lending decisions in Nepal.

Figure 1

Research Framework



(Source: Goet, 2021; Chhetri, 2023)

Dependent variable

The dependent variable is the factor that researchers measure or observe to see how it changes in response to the independent variable. It's the outcome or result that researchers are studying. The dependent variable, in this research, "Loans and Advances," is what researchers measure or observe to understand how it changes in response to variations in the independent variables. It represents the outcome or result that researchers are studying in their research.

a) Loan and advance

Loans and advances of commercial banks refer to the funds that banks lend to individuals, businesses, and other entities. These loans are a form of credit provided by banks to borrowers, typically with an agreement to repay the borrowed amount along with interest over a specified period. Loans and advances are a major source of revenue for commercial banks, as they earn interest income from the loans extended to borrowers. These funds are used for various purposes such as business investments, personal expenses, and financing projects.

Independent variables

The independent variable is the factor that researchers manipulate or change to observe its effect on the dependent variable. Independent variables for loans and advances in commercial banks include factors like Cash Reserve Ratio (CRR), Capital Adequacy Ratio (CAR), Interest Rate Spread, Total Deposits, and macroeconomic indicators such as the Inflation Rate. These variables impact the lending capacity, risk management, profitability, and overall lending behavior of commercial banks.

a) Cash reserve ratio

The Cash Reserve Ratio (CRR) applicable to commercial banks in Nepal is determined by the Nepal Rastra Bank (NRB), the country's central bank. This ratio mandates the percentage of total deposits that banks must maintain as reserves with the central bank. It is a regulatory measure aimed at managing liquidity within the banking system and influencing economic conditions, such as inflation rates. The specific CRR for commercial banks in Nepal is subject to periodic adjustments by the NRB, reflecting changes in economic and financial circumstances.

b) Capital adequacy ratio

The Capital Adequacy Ratio (CAR) is a vital measure used in banking to evaluate a bank's risk management capabilities and ability to meet financial obligations. It is mandated by banking authorities to ensure banks maintain sufficient capital to offset potential losses. CAR is computed by dividing a bank's total capital, encompassing Tier 1 and Tier 2 capital by its total risk-weighted assets (TRWA). This ratio offers insights into the bank's financial robustness concerning its risk exposure, showcasing its ability to navigate challenging scenarios.

c) Interest rate spread

Interest rate spread refers to the difference between the interest rate that banks earn on their assets, such as loans and investments, and the interest rate they pay on their liabilities, like deposits and borrowings. It represents the profit margin for banks and is influenced by factors such as market interest rates, credit risk, and the bank's operating costs. A wider interest rate spread generally indicates higher profitability for banks, while a narrower spread may indicate lower profitability or increased competition in the banking sector.

d) Total deposit

The total deposit of a bank represents the collective amount of money deposited by customers across various account types such as savings, current, fixed deposit, and recurring deposit accounts. These deposits form a significant portion of a bank's liabilities and play a crucial role in providing the necessary funds for lending and investment activities. Banks rely on deposits to meet customer withdrawal demands, finance loans, invest in securities, and manage day-to-day operations. The total deposit amount can fluctuate based on customer demand, economic conditions, interest rates, and competitive factors in the banking industry. Regulatory authorities monitor deposit levels to ensure banks maintain sufficient liquidity and manage risks effectively. Overall, total deposits reflect a bank's financial stability, customer base, and ability to support its operations and growth initiatives.

e) Inflation rate

The inflation rate measures how much prices of goods and services increase over the time. A higher inflation rate means prices are rising faster, reducing the purchasing power of money. Central banks and governments monitor inflation closely to maintain stable prices and economic growth. Factors like demand, supply, monetary policies, and external events influence inflation. Managing inflation is crucial for businesses, investors and individuals to make informed financial decisions.

CHAPTER – IV
RESULTS AND DISCUSSION

As discussed in previous chapters, the main objective of this study is to investigate the determinants of lending behavior in top commercial banks in Nepal. This chapter presents the results and discussion of the study. Both descriptive and inferential statistics have been employed to analyze the data. Descriptive statistics include measures such as the mean, standard deviation, minimum (min), maximum (max) and variance. Inferential statistics involve correlation analysis and multiple regression analysis using SPSS version 29.

4.1 Results

In this section of results, the study examines the determinants of lending behavior of Nepal's top commercial banks using statistical tools like descriptive statistics and inferential statistics. Descriptive statistics encompass measures such as arithmetic mean, standard deviation and variance offering an overview of the dataset. Inferential statistics involve analyses like Karl Pearson's correlation analysis and multiple regression analysis to explore variable relationships and determine the impact of different factors on lending behavior.

Descriptive statistics

This study's descriptive statistics provide an overview of the data used to analyze the lending behavior of top commercial banks in Nepal. The dependent variable is the natural logarithm of loans and advances (LnLA) while the independent variables are the Cash Reserve Ratio (CRR), Capital Adequacy Ratio (CAR), Interest Rate Spread (IRS) the natural logarithm of total deposits (LnTD) and the Inflation Rate (INF). The mean gives the average value for each variable and the standard deviation measures the amount of variation or dispersion from the mean. The minimum and maximum values define the data range. Variance, which is the standard deviation squared, also measures dispersion. These descriptive statistics help understand the central tendency and spread of the data providing a foundation for further inferential statistical analysis.

Table 2

Descriptive Statistics of all Variables of Sample Banks

Variables	N	Minimum	Maximum	Mean	SD	Variance
CRR	50	3.10	28.91	12.0036	8.04039	64.648
CAR	50	8.68	15.96	12.7472	1.54667	2.392
IRS	50	3.04	6.31	4.1132	0.69813	0.487
LnTD	50	10.01	12.79	11.5730	0.71970	0.518
INF	50	3.63	9.04	6.4210	2.04847	4.196
LnLA	50	9.79	12.65	11.3943	0.76238	0.581

(Source: SPSS Version 29)

Table 2 displays descriptive statistics for all variables. CRR ranges widely from 3.10 to 28.91 with a mean of 12.0036 and a significant standard deviation of 8.04039 (variance 64.648) indicating substantial variability. CAR has a narrower range (8.68 to 15.96) a mean of 12.7472 and a lower standard deviation of 1.54667 (variance 2.392) suggesting less variability than CRR. IRS ranges from 3.04 to 6.31 with a mean of 4.1132 and a relatively low standard deviation of 0.69813 (variance 0.487) indicating a more clustered distribution. LnTD spans from 10.01 to 12.79 with a mean of 11.5730 and a standard deviation of 0.71970 (variance 0.518) indicating moderate variability. INF ranges from 3.63 to 9.04, with a mean of 6.4210 and a standard deviation of 2.04847 (variance 4.196), suggesting broader dispersion. LnLA ranges from 9.79 to 12.65, with a mean of 11.3943 and a standard deviation of 0.76238 (variance 0.581) indicating relatively low variability. These statistics offer insights into central tendencies, dispersion and variability within each variable enhancing understanding of the dataset's characteristics.

Inferential statistics

Inferential statistics, including correlation and regression analysis help to understand relationships among variables. Correlation assesses the strength and direction between independent variables (CRR, CAR, IRS, LnTD and INF) and the dependent variable (LnLA) revealing how changes in one relate to changes in another. Regression analyzes how these variables collectively affect LnLA determining their predictive impact.

a) Correlation analysis

Descriptive analysis was conducted on the independent variables and the dependent variable. Correlation analysis is a technique used to assess the relationship between independent variables such as CRR, CAR, IRS, LnTD and INF with the dependent variable Natural Logarithm of Loans and Advances (LnLA). The study analyzed the inherent relationships among these variables. Karl Pearson's correlation analysis method has been used in this study with SPSS version 29 and the results are presented in Table 3.

Table 3

Karl Pearson's Correlation Analysis of Study Variables

Variables	CRR	CAR	IRS	LnTD	INF	LnLA
CRR	1					
CAR	-0.278	1				
IRS	0.020	-0.223	1			
LnTD	-0.298*	0.471**	0.134	1		
INF	0.369**	-0.397**	-0.019	-0.507**	1	
LnLA	-0.318*	0.513**	0.091	0.996**	-0.530**	1

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

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

(Source: SPSS Version 29)

Table 3 depicts the correlation analysis of independent variables such as CRR, CAR, IRS, LnTD and INF with dependent variable LnLA. The correlation between CRR, CAR, IRS, LnTD and INF of the banks with LnLA are -0.318, 0.513, 0.091, 0.996 and -0.530 respectively. It shows that LnLA has varying degrees of correlation with the other variables. LnLA has a moderate negative correlation with CRR at -0.318, indicating that higher CRR tends to decrease loans and advances. LnLA has a high positive correlation with CAR at 0.513, suggesting that better capital adequacy is associated with increased loans and advances. The correlation between LnLA and IRS is low and positive at 0.091, implying a minimal direct relationship. LnLA and LnTD have a very high positive correlation at 0.996, indicating that larger total deposits strongly correlate with higher loans and advances. Lastly, LnLA has a moderate negative correlation with INF (Inflation Rate) at -0.530 suggesting that higher inflation rates are associated with reduced loans and advances.

b) Multiple regression analysis

Regression analysis explores relationships between variables. A regression analysis provides more information about the slope of the relationship. It is used to describe the nature of a relationship and to make predictions. In this study, it has examined how CRR, CAR, IRS, LnTD and INF influence LnLA.

Table 4

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.998[a]	0.997	0.996	.04693

a. Predictors: (Constant), INF, IRS, CRR, CAR, LnTD

b. Dependent variable: LnLA

(Source: SPSS Version 29)

Table 4 shows that the R^2 value is 0.997, meaning the independent variables account for 99.7% of the variance in the dependent variable. The remaining 0.3% is due to other factors not included in the model. The Adjusted R^2, which adjusts for the number of predictors, is 0.996. This indicates that 99.6% of the variance in LnLA (dependent variable) is explained by LnTD, CRR, IRS, CAR and INF (independent variables) after accounting for degrees of freedom. The standard error of the estimate, measuring the average distance of the observed values from the regression line is 0.04693 indicating that the data points deviate from the fitted regression line by this amount on average.

Table 5

Analysis of Variance (ANOVA)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.383	5	5.677	2577.171	<0.001[b]
	Residual	0.097	44	0.002		
	Total	28.480	49			

a. Dependent variable: LnLA

b. Predictors: (Constant), INF, IRS, CRR, CAR, LnTD

(Source: SPSS Version 29)

Table 5 provides vital insights into the regression model's performance. The

Regression Sum of Squares (SS) at 28.383, with 5 degrees of freedom (df) and a mean square of 5.677, explains the variability in LnLA by the independent variables (INF, IRS, CRR, CAR, LnTD). The Residual SS of 0.097, with 44 df and a mean square of 0.002, accounts for unexplained variability in LnLA post-modeling. The Total SS of 28.480 with 49 df encompasses both explained and unexplained variability. The high F-statistic of 2577.171, accompanied by a significant p-value (<0.001), indicates a strong and statistically significant relationship between the independent variables and LnLA, validating the model's efficacy.

Table 6

Regression Analysis for Dependent Variable LnLA

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.538	0.146		-3.675	<0.001
CRR	-0.001	0.001	-0.010	-1.066	0.292
CAR	0.019	0.005	0.039	3.560	<0.001
IRS	-0.033	0.010	-0.031	-3.249	0.002
LnTD	1.027	0.012	0.969	86.037	<0.001
INF	-0.007	0.004	-0.019	-1.814	0.076

a. Dependent variable: LnLA

(Source: SPSS Version 29)

$LnLA = -0.538 - 0.001CRR + 0.019CAR - 0.033IRS + 1.027\ LnTD - 0.007IR + \varepsilon it$

Table 6 presents the multiple regression analysis results for LnLA (Logarithm of Loans and Advances) demonstrate significant predictors and their respective impacts. Capital Adequacy Ratio (CAR) exhibits a positive coefficient of 0.019 ($p < 0.001$), indicating a significant positive relationship with LnLA. Interest Rate Spread (IRS) has a negative coefficient of -0.033 ($p = 0.002$), showing a significant negative impact on LnLA. Logarithm of Total Deposits (LnTD) has a substantial positive coefficient of 1.027 ($p < 0.001$) indicating a highly significant positive influence on LnLA. Cash Reserve Ratio (CRR) shows a non-significant coefficient of -0.001 ($p = 0.292$), suggesting it does not significantly impact LnLA. Inflation Rate (INF) demonstrates a marginally non-significant coefficient of -0.007 ($p = 0.076$), implying a weak influence on LnLA. In summary, this detailed regression analysis underscores the

significance of CAR, IRS, and LnTD as influential factors in determining LnLA, offering comprehensive insights into the intricate dynamics of lending behavior within commercial banks.

4.2 Discussion

The main objective of this study is to analyze the determinants of lending behavior in top commercial banks in Nepal. Four bank-specific variables cash reserve ratio, capital adequacy ratio, interest rate spread, and total deposits and one macroeconomic variable, the inflation rate, were examined. The sample includes PRVU, NIMB, NMB, NIC Asia, and Kumari Bank. The study uses panel data from 2013/14 to 2022/23, sourced from the banks' annual reports and economic surveys. Data analysis employs both descriptive (mean, standard deviation, variance) and inferential (correlation, regression) statistics.

The descriptive statistics show significant variability in the dataset. CRR has a wide range (3.10 to 28.91) a mean of 12.0036 and a high standard deviation (8.04039). CAR is more consistent with a range of 8.68 to 15.96 a mean of 12.7472 and a lower standard deviation (1.54667). IRS is clustered with a mean of 4.1132 and a low standard deviation (0.69813). LnTD has moderate variability with a mean of 11.5730 and a standard deviation of 0.71970. INF shows broader dispersion with a mean of 6.4210 and a standard deviation of 2.04847. LnLA indicates relatively low variability with a mean of 11.3943 and a standard deviation of 0.76238.

The correlation analysis reveals varied relationships between LnLA (Logarithm of Loans and Advances) and other variables. LnLA has a moderate negative correlation with CRR (-0.318), indicating higher CRR reduces loans and advances. It has a high positive correlation with CAR (0.513), suggesting better capital adequacy increases lending. The correlation between LnLA and IRS is low and positive (0.091), showing minimal direct relationship. LnLA and LnTD have a very high positive correlation (0.996), indicating larger total deposits strongly correlate with higher loans and advances. LnLA has a moderate negative correlation with INF (-0.530), suggesting higher inflation reduces loans and advances. In addition, the multiple regression analysis reveals key predictors of the Logarithm of Loan and Advances (LnLA). The Capital Adequacy Ratio (CAR) positively impacts LnLA significantly (coefficient =

0.019, $p < 0.001$). The Interest Rate Spread (IRS) has a significant negative effect (coefficient = -0.033, $p = 0.002$). The Logarithm of Total Deposits (LnTD) shows a strong positive influence (coefficient = 1.027, $p < 0.001$). The Cash Reserve Ratio (CRR) and Inflation Rate (INF) are not significant predictors, with coefficients of -0.001 ($p = 0.292$) and -0.007 ($p = 0.076$), respectively. This analysis highlights the importance of CAR, IRS and LnTD in determining lending behavior in commercial banks.

The correlation test shows that the cash reserve ratio (CRR) has an insignificant negative relationship with loans and advances consistent with Goet (2021); Bhattarai and Sapkota (2023) but contrasting Bhattarai (2020) who observed a positive association. CRR also has a high positive correlation with CAR suggesting better capital adequacy increases lending which aligns with Chhetri (2023) but opposes Berhe (2020). The correlation between LnLA and IRS is low and positive indicating a minimal direct relationship consistent with Chhetri (2023) but inconsistent with Goet (2021); Bhattarai and Sapkota (2023). LnTD has a significant positive relationship with LnLA similar to findings by Yitayaw (2021); Goet (2021) but contrary to Berhe (2020); Adhikari and Jha (2020). Furthermore, LnLA has a moderate negative correlation with INF suggesting higher inflation reduces loan and advances consistent with Bhattarai (2020); Alsaket and Eksi (2020); Bhattarai and Sapkota (2023); Goet (2021) but contrasting Chhetri (2023); Niroula & Gnawali (2023).

The regression results indicate a significant negative effect of CRR on loans and advances of top commercial banks in Nepal consistent with the findings of Bhattarai (2020); Goet (2021); Chhetri (2023); Bhattarai and Sapkota (2023). However, this contradicts Makanile and Pastory (2022) who found a positive effect of CRR on lending. The positive coefficient of CAR aligns with Berhe (2020); Chhetri (2023); Arintoko (2021). ISR has a significant negative impact on loans and advances contradicting Goet (2021); Bhattarai and Sapkota (2023). LnTD shows a significant positive impact on loans and advances consistent with Adhikari and Jha (2020); Alsaket and Eksi (2020); Goet (2021); Berhe (2020). Lastly, INF has a significant negative effect on loans and advances consistent with Bhattarai (2020); Chhetri (2023); Goet (2021); Bhattarai and Sapkota (2023) but opposite to Niroula and Gnawali (2023).

CHAPTER – V
SUMMARY AND CONCLUSION

5.1 Summary

This chapter has three sections. The first section summarizes this study. The second section provides a conclusion of the study. The third section presents implications based on the summary and conclusion. The main objective of this study is to analyze the determinants of lending behavior of selected top commercial banks in Nepal focusing on four bank-specific independent variables such as CRR, CAR, IRS, TD and one macroeconomic independent variable inflation rate with dependent variable loans and advances. To achieve the specific objective of the study, descriptive and causal research has been carried out in terms of effect of determinants of lending behavior of top commercial banks in Nepal. Descriptive research design is adopted for analyzing status and pattern of lending whereas causal research design is followed to analyze the effect of determinants on lending behavior of top commercial banks in Nepal. To conduct this study, secondary data are taken from annual reports and financial results related websites of banks. Currently, there are 20 commercial banks in Nepal till 13th March 2024. In this study, all the commercial banks are population of the study among them only five commercial banks have been selected as sample for the present study. Initially, the researcher has chosen PRVU, NIMB and NMB as sample banks because Prabhu Bank was awarded Bank of the Year in 2023, NIMB Bank in 2022 and NMB Bank in 2021. Additionally, the researcher has purposively selected NIC Asia Bank Ltd. and Kumari Bank Ltd. as additional sample banks for a comparative analysis and to study the determinants of lending behavior of commercial banks in Nepal. Panel data from 2013/14 to 2022/23 were used sourced from annual reports and economic surveys. Descriptive statistics revealed significant variability in the dataset, particularly in CRR which ranged from 3.10 to 28.91 with a high standard deviation and in INF which showed broader dispersion. Other variables like CAR and IRS were more consistent.

The correlation analysis provided insights into the relationships between the variables and the Logarithm of Loans and Advances (LnLA). LnLA exhibited a moderate negative correlation with CRR indicating that higher cash reserve requirements reduce

lending. A high positive correlation with CAR suggested that better capital adequacy increases lending capacity. The correlation between LnLA and IRS was low and positive indicating a minimal direct relationship. The study found a very high positive correlation between LnLA and LnTD showing that larger total deposits strongly correlate with higher lending. Conversely, LnLA had a moderate negative correlation with INF suggesting that higher inflation rates reduce the volume of loans and advances.

Multiple regression analysis further highlighted the significant predictors of LnLA. CAR had a positive impact indicating that higher capital adequacy ratios promote lending. IRS negatively affected lending behavior, suggesting that higher interest rate spreads reduce loans and advances. LnTD was a strong positive predictor, reinforcing the importance of total deposits in lending activities. However, CRR and INF were not significant predictors, with their coefficients and p-values indicating a negligible effect on lending. These findings emphasize the critical roles of capital adequacy, interest rate spread, and total deposits in shaping the lending behavior of Nepalese commercial banks, while cash reserve ratios and inflation rates appear to have less direct influence.

5.2 Conclusion

The first objective of this study is to assess the lending position of selected commercial banks in Nepal. The study successfully assesses the lending position of top commercial banks in Nepal considering internal and external factors like cash reserve ratios, capital adequacy ratios, interest rate spreads, total deposits, inflation rates and loans and advances. Variations in lending positions among PRVU, NIMB, NMB, NIC Asia and Kumari Bank Limited are highlighted revealing strengths and areas for improvement in managing lending portfolios.

The second objective of this study is to examine the existence of relationships between determinants of lending behavior such as CRR, CAR, IRS, TD and INF with dependent variable Loan and Advance of selected commercial banks in Nepal. The study extensively examine relationships between independent variables such as CRR, CAR, IRS, TD and INF with dependent variable LnLA lending behavior of PRVU, NIMB, NMB, NIC ASIA and KBL banks. A moderate negative correlation with Cash

Reserve Ratio (CRR) suggests that higher CRR can constrain loans and advances, while a high positive correlation with Capital Adequacy Ratio (CAR) indicates that well-capitalized banks tend to extend more loans. Interest Rate Spread (IRS) shows a minimal direct relationship, while Total Deposits (LnTD) exhibit a strong positive correlation, indicating larger deposits are linked to higher loans. Inflation Rate (INF) exhibits a moderate negative correlation, implying that higher inflation may hinder lending activities. These findings emphasize the multifaceted impact of financial metrics on lending decisions within Nepal's banking sector.

The third objective of this study is to analyze the impact of determinants of lending behavior such as CRR, CAR, IRS, TD and INF on the dependent variable Loan and Advance of selected commercial banks in Nepal. CAR positively influences LnLA significantly indicating that higher CAR is associated with increased lending capacity and propensity to extend loans. IRS has a significant negative effect on LnLA implying that wider interest rate spreads can hinder lending activities within commercial banks. LnTD shows a strong positive influence on LnLA, highlighting the importance of robust deposit bases in facilitating lending and contributing to higher loan disbursement. CRR and INF are not significant predictors of LnLA, indicating limited impact on LnLA.

5.3 Implications

Based on the summary and conclusions of this study the following implications have been conducted by researcher:

i. **Lending strategies:** Banks in Nepal should focus on optimizing capital adequacy ratios and total deposits to improve lending strategies.
ii. **Risk management:** Robust risk management practices are crucial, especially in managing challenges posed by interest rate spreads.
iii. **Deposit mobilization:** Effective deposit mobilization is key for stable funding and supporting lending activities.
iv. **Monitoring and adaptation:** Continuous monitoring and adaptation of lending strategies are essential to stay competitive and sustainable.
v. **Future research:** Future research can explore long-term impacts of determinants on lending, dynamic modeling techniques, and effectiveness of interventions in enhancing lending and financial stability in Nepalese banks.

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APPENDIX – I

Data of selected sample Banks

Banks	Years	CRR (%)	CAR (%)	IRS (%)	TD (In Mill)	INF (%)	LA (In Mill)
PRVU	2013/14	19.27	8.68	6.31	32526	9.04	23245
	2014/15	15.69	10.61	5.14	42143	8.4	29683
	2015/16	12.13	12.29	5.09	60940	7.87	48212
	2016/17	11.58	11.18	3.27	81349	8.79	61979
	2017/18	6.83	11.86	4.72	97259	3.63	76172
	2018/19	4.39	11.16	4.70	112393	4.06	90250
	2019/20	11.20	11.18	3.57	136526	5.57	103134
	2020/21	4.26	13.10	3.65	169726	5.05	142264
	2021/22	3.67	12.86	4.32	182141	4.15	150419
	2022/23	3.66	11.87	4.86	295943	7.65	242103
NIMB	2013/14	19.2	11.27	5.41	73831	9.04	53458
	2014/15	12.00	11.90	4.46	90631	8.4	67690
	2015/16	7.2	14.92	4.45	108626	7.87	87009
	2016/17	10.5	13.02	3.90	125911	8.79	105577
	2017/18	8.2	12.66	4.59	140328	3.63	120825
	2018/19	5.5	13.26	4.38	152183	4.06	127141
	2019/20	8.7	13.54	3.99	168824	5.57	140002
	2020/21	4.4	14.71	3.33	179392	5.05	161912
	2021/22	3.1	15.96	4.00	186764	4.15	164813
	2022/23	3.5	13.32	4.99	360220	7.65	311623
NMB	2013/14	13.72	10.75	3.97	27087	9.04	20467
	2014/15	13.32	11.13	3.33	36722	8.4	27288
	2015/16	10.81	10.98	4.48	64781	7.87	54459
	2016/17	7.72	13.61	3.59	73224	8.79	62609
	2017/18	6.68	15.75	4.14	84507	3.63	75645
	2018/19	4.19	15.43	4.26	98516	4.06	91886
	2019/20	5.93	15.08	4.05	134810	5.57	121778
	2020/21	5.66	15.08	3.09	166453	5.05	158043
	2021/22	5.33	13.59	4.05	186399	4.15	182090
	2022/23	5.63	13.33	3.99	213041	7.65	197465
NIC Asia	2013/14	28.68	14.05	4.06	44984	9.04	37306
	2014/15	28.91	12.49	3.52	53447	8.4	43330
	2015/16	23.79	12.44	3.49	69488	7.87	59499
	2016/17	25.80	13.83	3.27	87678	8.79	72246
	2017/18	24.45	12.28	5.10	151219	3.63	120667
	2018/19	26.05	13.32	5.00	180575	4.06	150108
	2019/20	27.09	13.50	4.39	210843	5.57	173742
	2020/21	20.65	12.47	3.73	300252	5.05	264840
	2021/22	20.30	13.38	4.40	294977	4.15	268236
	2022/23	22.23	13.36	3.99	314312	7.65	271594
KBL	2013/14	13.00	11.51	3.62	22262	9.04	17871
	2014/15	17.92	11.29	3.11	26661	8.4	21443
	2015/16	12.95	11.92	3.70	30363	7.87	24891
	2016/17	22.35	10.71	3.04	58795	8.79	48832
	2017/18	12.07	11.18	3.37	63430	3.63	55828
	2018/19	4.59	11.75	3.54	84403	4.06	76584
	2019/20	3.78	15.35	4.07	124220	5.57	115133
	2020/21	3.72	13.71	3.13	157177	5.05	143772
	2021/22	3.78	12.63	4.07	182962	4.15	159444
	2022/23	4.10	12.11	4.98	326280	7.65	289387

(Source: Annual reports and financial results of sample banks 2013/14 to 2022/23)

APPENDIX – II

Data with LnTD and LnLA

Banks	Years	CRR (%)	CAR (%)	IRS (%)	LnTD	INF (%)	LnLA
PRVU	2013/14	19.27	8.68	6.31	10.39	9.04	10.05
	2014/15	15.69	10.61	5.14	10.65	8.4	10.30
	2015/16	12.13	12.29	5.09	11.02	7.87	10.78
	2016/17	11.58	11.18	3.27	11.31	8.79	11.04
	2017/18	6.83	11.86	4.72	11.49	3.63	11.24
	2018/19	4.39	11.16	4.70	11.63	4.06	11.41
	2019/20	11.20	11.18	3.57	11.82	5.57	11.54
	2020/21	4.26	13.10	3.65	12.04	5.05	11.87
	2021/22	3.67	12.86	4.32	12.11	4.15	11.92
	2022/23	3.66	11.87	4.86	12.60	7.65	12.40
NIMB	2013/14	19.2	11.27	5.41	11.21	9.04	10.89
	2014/15	12.00	11.90	4.46	11.42	8.4	11.12
	2015/16	7.2	14.92	4.45	11.60	7.87	11.37
	2016/17	10.5	13.02	3.90	11.74	8.79	11.57
	2017/18	8.2	12.66	4.59	11.85	3.63	11.70
	2018/19	5.5	13.26	4.38	11.93	4.06	11.75
	2019/20	8.7	13.54	3.99	12.04	5.57	11.85
	2020/21	4.4	14.71	3.33	12.10	5.05	12.00
	2021/22	3.1	15.96	4.00	12.14	4.15	12.01
	2022/23	3.5	13.32	4.99	12.79	7.65	12.65
NMB	2013/14	13.72	10.75	3.97	10.21	9.04	9.93
	2014/15	13.32	11.13	3.33	10.51	8.4	10.21
	2015/16	10.81	10.98	4.48	11.08	7.87	10.91
	2016/17	7.72	13.61	3.59	11.20	8.79	11.05
	2017/18	6.68	15.75	4.14	11.35	3.63	11.23
	2018/19	4.19	15.43	4.26	11.50	4.06	11.43
	2019/20	5.93	15.08	4.05	11.81	5.57	11.71
	2020/21	5.66	15.08	3.09	12.02	5.05	11.97
	2021/22	5.33	13.59	4.05	12.14	4.15	12.11
	2022/23	5.63	13.33	3.99	12.27	7.65	12.19
NIC Asia	2013/14	28.68	14.05	4.06	10.71	9.04	10.53
	2014/15	28.91	12.49	3.52	10.89	8.4	10.68
	2015/16	23.79	12.44	3.49	11.15	7.87	10.99
	2016/17	25.80	13.83	3.27	11.38	8.79	11.19
	2017/18	24.45	12.28	5.10	11.93	3.63	11.70
	2018/19	26.05	13.32	5.00	12.10	4.06	11.92
	2019/20	27.09	13.50	4.39	12.26	5.57	12.07
	2020/21	20.65	12.47	3.73	12.61	5.05	12.49
	2021/22	20.30	13.38	4.40	12.60	4.15	12.50
	2022/23	22.23	13.36	3.99	12.66	7.65	12.51
KBL	2013/14	13.00	11.51	3.62	10.01	9.04	9.79
	2014/15	17.92	11.29	3.11	10.19	8.4	9.97
	2015/16	12.95	11.92	3.70	10.32	7.87	10.12
	2016/17	22.35	10.71	3.04	10.98	8.79	10.80
	2017/18	12.07	11.18	3.37	11.06	3.63	10.93
	2018/19	4.59	11.75	3.54	11.34	4.06	11.25
	2019/20	3.78	15.35	4.07	11.73	5.57	11.65
	2020/21	3.72	13.71	3.13	11.97	5.05	11.88
	2021/22	3.78	12.63	4.07	12.12	4.15	11.98
	2022/23	4.10	12.11	4.98	12.70	7.65	12.58

(Source: Natural logarithm of TD and LA calculated by Microsoft office excel 2007)

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