

EMPIRICAL RESEARCH IN NEPALESE BUSINESS

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Foreword



I am happy to know that my friends in Nepal, Prof. Dr. Radhe Shyam Pradhan, Nar Bahadur Bista, Dr. Gangadhar Dahal and Mr. Sumit Pradhan are bringing out an edited book entitled "Empirical Research in Nepalese Business". I came to know them when I first visited Nepal to attend Eleventh Uniglobe International Management Conference on "Changing Perspectives of Business (UIMC CPB - 2023) dated April 19 & 20, 2023 organized by Uniglobe College (Pokhara University affiliate) as a Guest of Honor and Key Note Speaker. At that time, I did not find any standard book of readings on management in the context of Nepal. Then I delivered online keynote speech

for the second time in the 13th Uniglobe International Management Conference on "The Business of Growth: Challenges, Opportunities and Re-Engineering (UIMC BGCOR-2025)" dated February 5-6, 2025 organized by Uniglobe College (Pokhara University affiliate). Again, at that time also, I did not find any standard book of readings on management in the context of Nepal. Now that the book entitled "Empirical Research in Nepalese Business" is publishing soon, I believe that we now have some empirical evidences on Nepalese business. I came to know that the book is compilation of researches on finance, marketing, human resource management and economic environment and policy. I consider it as a very good effort fulfilling the gap created by a lack of such type of researches in Nepal. This kind of book is mainly useful for non-Nepali people like me because if I want to have some knowledge about Nepalese business, this single book is fulfilling the purpose.

I would like to take this opportunity to congratulate the editors and all the authors on coming up with such a useful book in the context of Nepal. I believe that this book is expected to be useful to management students, researchers, scholars, policy makers, academicians and practitioners as a whole. In my opinion this book is a must-read book for all, who make business in Nepal or with Nepal.

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August 20, 2025

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Preface

In today's rapidly changing business environment, finance, economics, marketing, and human resource management are essential for the success of any corporation. The collaboration between these domains is essential for efficient operations and enduring growth. Nevertheless, escalating competitiveness, economic fluctuations, and political uncertainty have rendered financial stability, cash flow management, and adaptation progressively more challenging for enterprises. Numerous companies find it challenging to manage economic recessions, evolving consumer tastes, and fierce market rivalry while preserving their brand name.

Recent advances in finance, marketing, human resources, and economic policy have profoundly altered global company operations. This book emphasizes the disparity between management theory and practice, especially in emerging economies such as Nepal. Drawing from extensive experience in teaching, research, and observation, we contend that management difficulties in developing countries significantly diverge from those in industrialized markets. Distinct economic, social, demographic, technological, and political elements influence business activities in these locations, resulting in unique legal and institutional frameworks. Over time, these disparities have become increasingly prominent. This book is as a resource for scholars and professionals, providing insights into the distinctive dynamics of management in emerging countries and connecting theoretical concepts with practical applications.

The book has been divided into 8 parts. Part I contains studies on marketing management in Nepal while Part II is devoted to studies relating to human resource management in Nepal. Part III is devoted to the studies on capital structure in Nepal while Part IV is devoted to studies relating to financial technology in Nepal. Similarly, Part V is concerned with studies on capital market development in Nepal. Moreover, Part VI contains studies on risk management in Nepal while Part VII is devoted to studies relating to profitability management in Nepal. Likewise, Part VIII is devoted to the studies on economic environment and policy in Nepal.

In Part I, Khatri examines the understanding the factors influencing students' choice of engineering schools of Kathmandu Valley. It shows how career opportunities, capacity building opportunities, learning environment, number of specialization fields and tuition fees affect the students' choice of engineering schools of Kathmandu Valley. Bhattarai and Pradhan investigate the role of artificial intelligence in enhancing customer service and efficiency in Nepalese banking sector. It offers insights into how experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility affect the customer satisfaction and service efficiency in the context of Nepalese commercial banks. B.K. and Rawat analyze the customer experience regarding FinTech in the context of Nepalese commercial banks. It indicates how ease of use, perceived value, customer support, assurance, speed, and perceived firm innovativeness affect the customer experience in Fintech in the context of Nepalese commercial banks. In addition, Bhatta examines the impact of behavioral biases

on investment decision and strategies of investors in Nepal Stock Exchange. It indicates how regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, and disposition effect bias affect trading frequency and portfolio diversification of investors in Stock Exchange. Rawal examine the impact of promotional tools on consumer buying behaviour in retail marketing in the context of Kathmandu Valley. It shows how price discount, coupon discount, buy one get one free, advertising on social media, free sample and bonus affect the consumer buying behaviour.

In Part II, Pandey determines the factors affecting employee retention in Nepalese commercial banks. It offers insights into how reward system, work life balance, work environment, training and development, leadership style and career opportunities affect the employee retention in commercial banks. Sharma and Pradhan analyze the impact of motivation on employees' loyalty in the context of Nepalese commercial banks. It indicates how working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation and employee motivation affect the employees' loyalty in commercial banks. Moreover, Sen and Pradhan examine the HR intervention for stress management in Nepalese organization. It indicates how job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, and work life balance affect the stress management in organizations. Khadka and Rawat assess the impact of social networking sites on employee work performance: A case of Nepalese commercial banks. It shows how usefulness, subjective norms, ease of use, intensity of use, and availability affect the employee work performance.

In Part III, Pathak and Pradhan examine the effect of leverage, assets growth, market capitalization and firm age on profitability of the Nepalese insurance companies. It shows how debt to equity ratio, debt to assets ratio, long-term debt to assets ratio, assets growth, market capitalization and firm age affect the profitability. Tamang investigates the impact of capital structure on firm value in the context of Nepalese insurance companies. It shows how long term debt ratio, short term debt ratio, total debt ratio, debt to equity ratio, firm size and liquidity affect the market capitalization and book value per share. Bhatta analyzes the effect of leverage, operating efficiency, non-performing loan and capital adequacy on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of leverage, operating efficiency, non-performing loan, capital adequacy loan loss provision and bank size with return on assets and return on equity in the context of Nepalese commercial banks. Dahal investigates the impact of capital adequacy and capital structure on stock return of Nepalese commercial banks. It shows how core capital ratio, capital adequacy ratio, long term debt to total equity, total equity to total assets, total debt to total assets, and total debt to total equity affect the stock return of commercial banks.

In Part IV, Gurung analyzes the impact of financial technology on the performance in the context of Nepalese commercial banks. It indicates how internet banking, mobile banking, POS banking, digital wallet, digital lending affect the performance. Shrestha analyzes the effect of e-banking on the performance of Nepalese commercial banks. It indicates how mobile banking, internet banking, ATM banking, point of sale, digital wallet and credit card on affect the performance.

In Part V, Mishra and Pradhan examine the impact of credit risk management on stock returns

in the context of Nepalese insurance companies. It shows how non-performing loan, capital adequacy ratio, cost efficiency ratio, liquidity ratio, bank size and cash reserve ratio affect the earnings per share and market price per share. Shahi analyzes the impacts of interest rate changes on banks stock return of Nepalese commercial banks. It indicates how interest rate, exchange rate, deposit interest rate, inflation rate, bank rate, and loan to deposit ratio affect the stock return. Kilambu assesses the relationship between bank efficiency and stock return of Nepalese commercial banks. It offers insights into how operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, and return on equity affect the stock return and earnings per share. Further, Yadav examines the impact of fundamental factors on stock price of Nepalese commercial banks. It offers insights into how price earnings ratio, return on equity, firm size, dividend per share, earning per share, and return on assets affect the stock price of banks.

In Part VI, Mahato and Bista examine the effect of credit risk, interest rates and monetary policy on the financial performance of Nepalese commercial banks. It indicates how non-performing loans, loan loss provisions, interest rate spread, loan-to-deposit ratio, cash reserve ratio, and statutory liquidity ratio affect the profitability. Yadav and Bista examine the effects of interest rate, inflation, and bank specific risk factors on the performance of Nepalese commercial banks. Specifically, it examines the relationship of interest rate spread, inflation, credit risk, capital adequacy ratio, liquidity risk, and operational risk with performance of Nepalese commercial banks. In addition, Balami examines the impact of risk management on the profitability of Nepalese commercial banks. It offers insights into how non-performing loan, capital adequacy ratio, cash reserve ratio, loan-to-deposit ratio, current ratio, and cash to deposit ratio affect the profitability of banks. Karki examines the impact of credit risk, liquidity, loan loss provision, size and beta on the profitability of Nepalese commercial banks. It offers insights into how capital adequacy ratios, non-performing loans, loan-to-deposit ratios, loan loss provisions, bank size, and market risk affect the profitability of banks.

In Part VII, Timalisina assesses the effect of liquidity on the profitability of Nepalese commercial banks. It offers insights into how investment ratio, capital ratio, liquidity ratio, cash-deposit ratio and deposit assets ratio affect the profitability. Similarly, Thapa and Pradhan investigate the impact of interest rate changes on the profitability of Nepalese commercial banks. It offers insights into how spread rate, lending rate, inflation rate, base rate, deposit rate, and exchange rate affect the profitability. Thagunna analyzes the financial ratios and prediction of financial distress in Nepalese commercial banks. It indicates how return on equity, return on assets, leverage, capital adequacy ratio, total debt to total equity and total equity to total assets affect the financial distress. Bhatta and Pradhan examine the role of asset management, operational efficiency and expense management on the financial performance of Nepalese commercial banks. It indicates how total asset turnover ratio, non-performing loan, loan to deposit ratio, employee expenses, staff bonus to employee expenses ratio and operating expenses ratio affect the financial performance of banks. Poudyal and Rawat investigate the organization characteristics, efficiency, financial regulation and performance of Nepalese commercial banks. It offers insights into how bank size, non-performing loans, number of branches, operating efficiency, capital adequacy ratio, cash reserve ratio and loan-to-deposit ratio affect

the performance of banks. Sharma examines the effect of diversification on profitability of Nepalese commercial banks. It shows how income diversification, geographical diversification, product diversification, asset diversification, funding diversification and board diversification affect the return on assets and return on equity. Koirala and Pradhan examine the effect of employee cost and employee size on the profitability of Nepalese commercial banks. It indicates how number of employees, salary expenses, training and development expenses, employee bonus, employee allowances and employee insurance affect the profitability of banks.

In Part VIII, Rokaya and Bista analyze the impact of government expenditure on economic growth of Nepal. It indicates how agriculture expenditure, education expenditure, health expenditure, transportation expenditure, communication expenditure and electricity expenditure affect the gross domestic product and per capita income of Nepal. Phuldel analyzes the determinants of financial distress of Nepalese commercial banks. It offers insights into how institutional variables such as leverage, return on equity, capital adequacy ratio and macroeconomic variables such as gross domestic product, interest rate and inflation affect the financial distress indicators which are Altman Z-score and non-performing loan in the context of banks. Devkota and Pradhan investigate the financial stability and soundness of Nepalese commercial banks. It offers insights into how capital adequacy ratio, non-performing loan, loan loss provision, loan to deposit ratio, leverage, cash reserve ratio and interest rate spread affect the financial stability and soundness of commercial banks. Similarly, Acharya and Bista analyze the impact of macroeconomic variables on money supply in Nepalese economy. It indicates how inflation, gross domestic product, cash reserve ratio, import, export, and exchange rate affect the money supply and money supply to gross domestic product ratio in the economy. Khadka and Dahal investigate the impact of financial development on profitability of Nepalese commercial banks. It shows how capital adequacy ratio, non-performing loan, operational efficiency ratio (cost to income ratio), inflation, bank concentration and gross domestic product affect the profitability of banks.

There exists a considerable literature on management in the context of developed countries but such literatures are scanty in an emerging country like Nepal. In this context, the present book which contains four studies on capital structure, two studies on financial technology, four studies on capital market development, four studies in risk management, seven studies in profitability management, five studies on economic environment and policy, five studies on marketing management and four studies on human resource management and leading a total of 35 studies provides a very good literature in the context of Nepal. It also provides a good base for carrying out further studies in Nepal. Hence, these studies carry a good deal of significance. There are some studies already dealing with the themes, yet we still do not have complete knowledge. With the present study, we have now at least some new research evidences. Each study has gone through several phases of research such as the following: (1) Definition of the problem (2) Review of literature (3) Formulation of a research design and selection of a methodology (4) Data collection (5) Presentation and analysis of data, and (6) Conclusions, interpretations and inferences.

Each study has clearly defined the research objectives. A comprehensive review of literature

review has also been made by each of these studies. The methodology adopted by each study is sound which also contained, among others, the use of several statistical tools and techniques. The analysis of data consists of organizing, tabulating, and performing statistical analysis. Implications are made as the final product in each of these studies. In each study, the researcher has gone from the statement of the problem to the recommendation for the solution of the problem: the complete cycle of a well-organized study.

This book would not be possible without the generous contribution of the article by the authors. Hence, we would like to express our sincere gratitude to all the authors for contributing their quality research works for the purpose of this book. They all deserve a special note of appreciation. This book can be used as a basis for class discussions in seminars or case-oriented courses, or it can serve in lecture courses as a companion to a main text when more extensive coverage is desired.

We would like to acknowledge with thanks the efforts made by Mr. Murari Prasad Dhakal, Managing Director, Dibyajyoti Printers and Multipurpose Pvt. Ltd., Thapagaun, Baneshwor and his whole team for the speedy publication of this book. Specifically, we would like to thank Bishal Singh Bist and Dipesh B.K. for the design and layout of the book. Needless to say, we alone are responsible for any deficiencies that may have remained in this book.

September 2025

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Part I:

Marketing Management

Chapter 1

Understanding the factors influencing students' choice of engineering schools of Kathmandu Valley

- Gaurav Khatri*

Abstract

This study examines the understanding the factors influencing students' choice of engineering schools of Kathmandu Valley. Choice of students is the selected dependent variable. The selected independent variables are career opportunities, capacity building opportunities, learning environment, number of specialization fields and tuition fees. The primary source of data is used to assess the opinions of the respondents regarding career opportunities, capacity building opportunities, learning environment, number of specialization fields, tuition fees, and choice of students. The study is based on primary data of 125 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of the factors influencing students' choice of engineering schools of Kathmandu Valley.

The study showed that career opportunities have a positive impact on choice of students. It indicates that students are attracted to particular fields of engineering by high placement rates. Similarly, capacity building opportunities have a positive impact on choice of students. It indicates that students are more likely to select particular engineering schools when they have access to training sessions provided by industry professionals. Likewise, learning environment has a positive impact on choice of students. It indicates that students' selection of engineering colleges is determined by the availability of knowledgeable and encouraging faculty members. In addition, number of specialization fields have a positive impact on choice of students. It indicates that a wider range of students are attracted to institutions that offer several areas of concentration. Further, tuition fees have a positive impact on choice of students. It indicates that tuition fees may be perceived as a reflection of the quality of education and resources available.

Keywords: career opportunities, capacity building opportunities, learning environment, number of specialization fields, tuition fees, choice of students

1. Introduction

A comprehensive knowledge of the quality of education at institutions is necessary. A comprehensive understanding of educational quality at colleges is crucial, since it directly influences students' capacity to get the information and skills required to become responsible and productive citizens. Quality education not only prepares individuals for personal and professional achievement but also significantly contributes to their holistic development as capable members of society (Mohobelo *et al.*, 2022). High-quality education aims to provide students with the information and skills necessary to become responsible and productive citizens. Quality is the primary competitive advantage for universities to recruit and retain student loyalty. Student enrollment is the most critical foundation for the success of any college. For universities, providing high-quality education is a crucial competitive advantage that aids in attracting and retaining students, so assuring enduring loyalty and reputation. The focus on quality signifies an institution's dedication to academic achievement and student-centered procedures, which subsequently influences prospective students' decisions on their educational choices. Moreover, student enrollment acts as a vital indicator of a college's performance, reflecting confidence in its programs, staff, and facilities. Consequently, promoting excellent education not only fosters the intellectual and personal development of students but also guarantees ongoing growth and respect for educational institutions.

* Mr. Khatri is a Freelance Researcher, Kathmandu, Nepal.

As the number of students pursuing higher education rises, universities are using market-oriented methods similar to those of commercial enterprises, aiming to recruit and retain students, regarded as clients in a competitive educational environment. To endure and prosper, colleges prioritize the enhancement of their scientific endeavors and campus infrastructure, which substantially bolster their prestige. A robust reputation not only draws potential students but also encourages current students and graduates to endorse the university to others, fostering a beneficial cycle of word-of-mouth marketing. Given that these suggestions significantly impact university selection, these dynamics are especially pertinent for practitioners and administrators seeking to enhance their institution's market share. By comprehending and using these characteristics, universities may enhance their positioning in the regional and worldwide education market, assuring sustained growth and heightened attractiveness to prospective students (Budur *et al.*, 2018). When choosing a higher education school, students evaluate several elements that impact their decision-making, with five primary criteria standing out as the most important. The initial aspect is the accessibility of support systems, which include both tangible resources, such as bookstores and counseling offices, and intangible supports like scholarships, credit transfer opportunities, and spiritual programs. These systems offer crucial assistance to students throughout their academic pursuits, ensuring their requirements are thoroughly addressed. The second component is the educational environment, encompassing the presence of contemporary facilities, a robust institutional reputation, visually appealing campuses, and well-resourced libraries and computer laboratories. Furthermore, colleges exhibiting elevated graduate employment rates are very appealing, as work opportunities are a vital factor for students (Agrey and Lampadan, 2014). The third issue is the availability of athletic facilities, as students increasingly prioritize access to physical and recreational activities that promote a balanced and healthy lifestyle. The fourth component is a comprehensive student life program that includes healthcare services, decent housing, and many extracurricular activities, promoting community and belonging. The significance of a secure and congenial atmosphere is paramount; students choose campuses that are safe and where staff members engage in helpful and welcoming interactions (Miotto *et al.*, 2020).

Siann and Callaghan (2001) evaluated the underrepresentation of women in scientific, engineering, and technical (SET) courses in higher education in Britain, along with the underlying causes of this phenomenon. The study argued that instead than emphasizing a barrier model portraying women as largely passive, greater attention should be directed on the degree to which women's employment decisions stem from affirmative choices. Similarly, Sidin *et al.* (2003) examined the parameters by which students choose their higher education institutions. The study stated that students' college decision is contingent upon several aspects, including academic excellence, facilities, campus environment, and individual attributes. Likewise, Reed and Case (2003) investigated the determinants that led first-year students in the Department of Mechanical Engineering at the University of Cape Town to choose a career in mechanical engineering. The study indicated that several factors affect certain groups of learners in their career decision-making process. Further, Stephen and Makotose (2007) examined the factors influencing the career choices of female engineering students at the onset of the twenty-first century. The study found that adverse effects encountered by female engineering students about their job selection, a profound passion in engineering motivated their choice, as evidenced by the 98% approval rate among them. In addition, Matusovich *et al.* (2010) sought to elucidate the factors influencing students' decisions to pursue engineering. The study indicated that individuals attribute varying patterns of value or personal significance to obtaining an engineering degree. Additionally, a key distinguishing characteristic of these patterns is whether individuals select engineering in alignment with their own identity or self-concept. The study also concluded that values significantly influence students' decisions to pursue engineering careers. To enhance persistence rates, we must prioritize values, particularly by assisting students in linking their personal identities to engineering identities. Moreover, the factors influencing college major selection assessed by Wiswall and Zafar (2015).

The study revealed that there is a link between preferences and earnings expectations exaggerate the influence of earnings on college major selections. The study obtained the welfare benefits from the information experiment and see positive average welfare gains.

Jian *et al.* (2010) examined the preferences of Taiwanese and Norwegian students regarding university selection, study programs, course attributes, and potential job characteristics. The findings indicated that a career-oriented curriculum is devoid of cultural bias. Furthermore, personal recommendations are the most favored criterion among Taiwanese students while selecting a university. Similarly, Yazici and Yazici (2010) investigated the relative impact of various circumstances and individuals on college major selection and perceptions of procedural justice among 449 undergraduate students from one private and two public institutions in Turkey. The study showed that, although the decisions of male and female students were affected by comparable events and individuals, female students reported a greater sense of procedural justice. Likewise, Carnasciali *et al.* (2013) examined the decision-making processes of engineering students on their selection or alteration of engineering disciplines to identify the effects and mechanisms that affect their choice of major at the University of New Haven (UNH). The finding of the study suggested that gender and parental educational attainment influence the selection of engineering majors at UNH. Moreover, just 66% of engineering students said that they had identified their precise major prior to exploring prospective colleges throughout their search. Further, Sabir *et al.* (2013) examined the elements that students consider essential regarding their selection of university and preferred courses. The study elucidated the dynamics of the undergraduate student market and discussed the consequences for institutions seeking to reposition themselves in competitive educational marketplaces. In addition, Mustafa *et al.* (2018) examine many factors influencing high school students' judgments about college and university selection in Qatar. The findings of this study will assist higher education institutions in Qatar and the surrounding region in enhancing their positioning and formulating focused strategies to recruit a varied student demographic.

Arif (2019) investigated the determinants influencing students' selection of academic vocations at the university level, as well as the impact of certain personal attributes and academic assistance on their future professional choices. The study delineated the problems encountered by students in Pakistan in aligning their job choices with their talents, so expanding the academic literature on student career choices from a Pakistani viewpoint. Similarly, Gillis and Ryberg (2021) examined the orientations students employ in selecting their majors, the variability of these orientations based on student characteristics, the stability of orientations over the first year of college, and the processes that may elucidate changes in orientations. The study revealed that Students depend on several orientations, such as acquiring knowledge and assisting others, and their primary orientations sometimes fluctuate over their initial year in college. Likewise, Gille *et al.* (2022) examine the decision-making processes influencing students' selection of engineering institutions. The results demonstrated that the pre-university model (preparatory programs) significantly impacts the recruiting process of engineering schools in attracting outstanding candidates. Further, Mohobelo *et al.* (2022) examined the determinants affecting students' university selection to facilitate efficient planning for student recruiting tactics. The study's findings indicated that university reputation, course diversity, and safety and security were the primary variables affecting students' institution selection. The course cost, location, and logistics exerted minimal effect on students' university selection. In addition, Sadjail *et al.* (2022) identified the determinants affecting the selection of Education as a major among students at the College of Education, MSU-TCTO. The study concluded that several variables affected COED students' decision to pursue the Education course. Moreover, the courses they are presently undertaking were not exclusively selected by them. The impact of others in selecting a course may facilitate or impede their success in life.

Connie *et al.* (2022) analyzed critical elements influencing high school students' selection of higher education institutions (HEIs). The findings indicated a substantial correlation among program, university reputation, career opportunities, cost, security, educational quality, campus facilities, events, location, peers, mentorship, satisfaction, and college selection. Similarly, Kakkad and Kamath (2023) evaluated the influence of campus placement as a decisive element in students' college choices. The study concluded that placement is a determining factor in the selection of institutions across many disciplines. Likewise, Chavan and Mehta (2024) examined the determinants affecting students' selection of higher education institutions. The study identified eight major characteristics that affected HEI selections. The factors include 'Enrolment Value Optimization' (EVO), 'External Psychic Influence' (EPI), 'Internal Psychic Influence' (IPI), 'Academic Infrastructure Influence' (AII), 'Internal Financial Influence' (IFI), 'Pedagogical Aspects' (PEA), 'Objective Based Education' (OBE), and 'Choice-Based Credit System' (CBCS).

In the context of Nepal, Silwal and Baral (2021) evaluates the predominance of institutional, commercial, and social elements in this decision-making process. The findings indicated that colleges should prioritize the implementation of diverse academic programs, ensure quality education by appointing highly qualified faculty, and enhance social support, student employability in the job market, and enrollment rates in higher education. Similarly, Gurung *et al.* (2022) analyzes the institutional elements that are more influential in college selection decisions. The study concluded that universities in promoting themselves to potential students and comprehending the motivations behind individuals' pursuit of higher education by identifying the most critical institutional elements. Likewise, Gurung *et al.* (2023) investigate the satisfaction of business students regarding academic and non-academic services. The study suggested that student happiness with their educational experience is influenced not just by academic elements but also by the quality of administrative services, which greatly impacts their overall assessment of the institution. Further, Sudarshan *et al.* (2024) delineate the principal variables that entice students to matriculate in private institutions beyond Kirtipur. The study's findings indicated that academic programs, tuition prices, educational facilities, quality of education, and promotional efforts positively influence student enrollment, however geography and social variables exert minimal impact.

The above discussion shows that empirical evidences vary greatly across the studies on understanding the factors influencing students' choice of engineering schools. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the understanding the factors influencing students' choice of engineering schools of Kathmandu Valley. Specifically, it examines the relationship of career opportunities, capacity building opportunities, learning environment, number of specialization fields and tuition fees with students' choice of engineering schools of Kathmandu Valley.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 125 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on career opportunities, capacity building opportunities, learning environment, number of specialization fields, tuition fees, and choice of students. The study is based on descriptive and causal

comparative research designs.

The model

The model estimated in this study assumes that choice of students depend upon career opportunities, capacity building opportunities, learning environment, number of specialization fields and tuition fees. Therefore, the model takes the following form:

$$CS = \beta_0 + \beta_1 CO + \beta_2 CBO + \beta_3 LE + \beta_4 NSF + \beta_5 TF + e$$

Where,

CS = Choice of students

CO = Career opportunities

CBO = Capacity building opportunities

LE = Learning environment

NSF = Number of specialization fields

TF = Tuition fees

Choice of students were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include "Engineering schools are frequently selected by students based on their academic standing and rankings", "Students' decisions might be influenced by the availability of specialized programs" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.790$).

Career opportunities were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include "Students' choice of engineering colleges is heavily influenced by their career possibilities", "Students are attracted to particular fields of engineering by high placement rates" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.714$).

Capacity building opportunities were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include "Programs which generate capability enhance students' abilities that affects which engineering schools they choose", "Colleges with strong internship programs are preferred by students looking to advance their careers" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.838$).

Learning environment was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include "Students are attracted to engineering colleges because of the modern, well-equipped instructional environment", "Students' choices of engineering schools are influenced by their access to modern laboratories and technologies" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.753$).

Number of specialization fields were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include "A wider range of students are attracted to institutions

that offer several areas of concentration”, “A diverse curriculum with various specializations enhances the learning experience and attracts students” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.864$).

Tuition fees were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “The availability of financial aid may have an impact on students’ decisions to enroll in more expensive engineering programs”, “A student’s decision to choose a college of engineering can be greatly influenced by scholarships and grants” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.714$).

The following section describes the independent variables used in this study along with the hypothesis formulation:

Career opportunities

Enhanced employment prospects frequently constitute a crucial determinant in the choice of a particular college, particularly for students engaged in specialized disciplines such as engineering. Students sometimes favor colleges with a demonstrated history of generating graduates who get lucrative employment, internships, or research positions. Institutions with substantial industry connections, extensive alumni networks, and collaborations with prominent firms are seen as pathways to enhanced career opportunities (Xu, 2013). Dick and Rallis (1991) investigated the determinants and effects affecting high school students’ profession selections. The results indicated that superior employment possibilities influence the choice of particular colleges. These universities frequently provide career-focused programs, placement services, and chances for practical experience, including internships or joint projects with industry experts. These attributes not only augment a student’s competencies but also elevate their employability. Furthermore, Talib *et al.* (2015) showed that a college’s reputation in the job market substantially impacts students’ decisions. Employers frequently prefer graduates from esteemed universities, so incentivizing students to choose colleges recognized for their career-oriented emphasis. Moreover, Wang *et al.* (2022) assert that institutions prioritizing the development of students’ soft skills, technological competencies, and real-world problem-solving capabilities are generally favored. The presence of support networks such as career counseling, mentoring programs, and job fairs might influence a student’s choice of institution. Essentially, when students recognize a direct connection between education and their intended professional goals, it significantly influences their decision-making process (Workman, 2015). Based on it, the study develops following hypothesis:

H₁: There is a positive relationship between career opportunities and choice of students.

Capacity building opportunities

Capacity-building possibilities significantly impact the choice of certain universities, especially for students pursuing comprehensive development and enduring career advancement. Capacity development denotes the augmentation of skills, knowledge, and competencies that equip students for both academic achievement and professional and personal success (Cohen, 1995). Colleges that provide a variety of capacity-building programs, including leadership training, entrepreneurial seminars, research efforts, and extracurricular activities, typically attract students seeking holistic development. King and Bouchard (2011) assert that students are attracted to universities that emphasize experiential learning possibilities, including practical projects, industrial partnerships, and involvement in national or worldwide contests. These exercises cultivate critical thinking, problem-solving, and collaboration, allowing students to excel in competitive employment markets. Moreover, engineering institutions that prioritize innovation via advanced labs, research facilities, and incubation centers

attract students eager to develop technical proficiency and engage in pioneering endeavors within their disciplines. Mentorship programs and access to teachers with varied academic and industrial backgrounds considerably enhance capacity building. Institutions that promote student engagement in decision-making processes, such as leadership positions in student councils or involvement in curriculum creation, create an enabling atmosphere for students to enhance their interpersonal and management abilities (Shiel *et al.*, 2016). Additionally, institutions providing capacity-building programs frequently provide networking opportunities via alumni engagements, guest presentations, and career expos. These relationships expand students' horizons and introduce them to varied ideas and possibilities. Scholarships, financial assistance for professional certifications, and opportunities for worldwide education via exchange programs are supplementary factors that students assess when determining a college's ability to augment their potential (Thoonen *et al.*, 2012). Based on it, the study develops following hypothesis:

H₂: There is a positive relationship between career building opportunities and choice of students.

Learning environment

Bezuidenhout *et al.* (2013) asserted that teachers significantly influence the learning environment. Students are more inclined to select universities when lecturers possess both academic qualifications and a friendly, accessible demeanor. Educators who promote critical thinking, facilitate open discourse, and offer mentorship establish a supportive atmosphere that inspires students to thrive. Institutions with a low student-to-teacher ratio facilitate individualized attention, hence improving educational quality. Moreover, peer engagement and campus culture play a crucial role in shaping the learning environment. Institutions that advocate for diversity and inclusion facilitate students' exposure to varied ideas and experiences, cultivating a cooperative and inventive environment. Collaborative projects, team-oriented assignments, and student-driven initiatives foster collaboration and equip students for authentic teaming situations (Yusuf *et al.*, 2017). The incorporation of extracurricular activities, including clubs, technical contests, and cultural events, enhances the educational experience. These activities provide students the chance to investigate their interests, cultivate soft skills, and establish networks that enhance their academic endeavors. Moreover, institutions that prioritize mental health and well-being via counseling services, stress management seminars, and a balanced academic schedule foster an environment conducive to students' academic and personal success (Briggs, 2006). Based on it, the study develops following hypothesis:

H₃: There is a positive relationship between learning environment and choice of students.

Number of specialization fields

Drewes and Michael (2006) said that a varied range of specializations demonstrates the college's dedication to academic and technical progress. It signifies strong infrastructure, faculty proficiency, and research competencies, which jointly bolster the institution's reputation. Students view these universities as more prepared to offer thorough education and training, which is crucial for excelling in competitive professional environments. Specialization domains influence employment prospects by allowing students to acquire competence in high-demand specialist areas (Thoonen *et al.*, 2012). Institutions that implement programs matched with global trends and industry demands frequently achieve elevated placement rates, becoming them a favored option for students pursuing specific professional advancement. Based on it, the study develops following hypothesis:

H₄: There is a positive relationship between number of specialization fields and choice of students.

Tuition fees

Tuition prices significantly impact students' selection of a particular institution, particularly in areas where affordability is a major concern for families. Dick and Rallis (1991) asserted that for numerous students, the expense of education is a critical determinant that directly influences their capacity to pursue higher education and informs their choice of school. Institutions with economical tuition rates are frequently regarded as more attainable, particularly for middle- and lower-income households. King and Bouchard (2011) shown that students pursuing great education at an affordable price are inclined to choose schools that provide value without sacrificing academic excellence. These institutions frequently present themselves as appealing alternatives for a broader demography, guaranteeing that schooling remains accessible to various socio-economic sectors (Cohen, 1995). Besides cost, the presence of financial assistance, scholarships, and installment payment options significantly impacts students' choices (Bezuidenhout *et al.*, 2013). Colleges that offer merit-based or need-based scholarships present an additional motivation for academically proficient or financially disadvantaged students. These financial assistance options mitigate the cost of tuition fees and enhance the inclusivity of higher education (Xu, 2013). Based on it, the study develops following hypothesis:

H₃: There is a positive relationship between tuition fees and choice of students.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with mean and standard deviation has been computed and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 125 observations. The dependent variable is CS (Choice of students). The independent variables are CO (Career opportunities), CBO (Capacity building opportunities), LE (Learning environment), NSF (Number of specialization fields), and TF (Tuition fees).

Variables	Mean	S.D.	CS	CO	CBO	LE	NSF	TF
CS	3.832	0.514	1					
CO	3.830	0.524	0.479**	1				
CBO	3.691	0.519	0.455**	0.562**	1			
LE	3.666	0.505	0.406**	0.569**	0.569**	1		
NSF	3.533	0.524	0.370**	0.532**	0.557**	0.665**	1	
TF	3.642	0.437	0.354**	0.388**	0.511**	0.448**	0.447**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 1 shows that career opportunities is positively correlated to choice of students. It suggests that students are attracted to particular fields of engineering by high placement rates. Similarly, capacity building opportunities is positively correlated to choice of students. It suggests that students are more likely to select particular engineering schools when they have access to training sessions provided by industry professionals. Likewise, learning environment has a positive relationship with choice of

students. It indicates that students' selection of engineering colleges is determined by the availability of knowledgeable and encouraging faculty members. Further, number of specialization fields has a positive relationship with choice of students. It indicates that a wider range of students are attracted to institutions that offer several areas of concentration. In addition, tuition fees is positively correlated to choice of students. It indicates that tuition fees may be perceived as a reflection of the quality of education and resources available.

Regression analysis

Having analyzed the Kendall's Tau correlation coefficients matrix, the regression analysis has been carried out and the results are presented in Table 2. More specifically, it presents the regression results of career opportunities, capacity building opportunities, learning environment, number of specialization fields, and tuition fees on choice of students.

Table 2

Estimated regression results of career opportunities, capacity building opportunities, learning environment, number of specialization fields, and tuition fees on choice of students

The results are based on 125 observations using linear regression model. The model is $CS = \beta_0 + \beta_1 CO + \beta_2 CBO + \beta_3 LE + \beta_4 NSF + \beta_5 TF + e$, where the dependent variable is CS (Choice of students). The independent variables are CO (Career opportunities), CBO (Capacity building opportunities), LE (Learning environment), NSF (Number of specialization fields), and TF (Tuition fees).

Model	Intercept	Regression coefficients of					Adj. R ²	SEE	F-value
		CO	CBO	LE	NSF	TF			
1	2.034 (6.780)**	0.469 (6.050)**					0.223	0.450	36.600
2	2.166 (7.301)**		0.451 (5.671)**				0.201	0.460	32.155
3	2.319 (7.419)**			0.413 (4.923)**			0.158	0.472	24.236
4	2.558 (8.494)**				0.283 (3.536)**		0.13	0.479	19.557
5	2.315 (6.360)**					0.283 (3.536)**	0.118	0.483	17.614
6	1.612 (4.963)**	0.320 (3.511)**	0.451 (5.671)**				0.268	0.440	23.723
7	1.498 (4.400)**	0.280 (2.862)**	0.230 (2.322)*	0.084 (0.731)			0.27	0.439	16.257
8	1.485 (4.307)**	0.275 (2.766)**	0.230 (2.322)*	0.084 (0.731)	0.031 (0.286)		0.264	0.44	12.121
9	1.285 (3.325)**	0.270 (2.714)**	0.230 (2.322)*	0.084 (0.731)	0.015 (0.139)	0.124 (1.139)	0.266	0.4409	9.980

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Choice of students is the dependent variable.

Table 2 shows that the beta coefficients for career opportunities are positive with choice of students. It indicates that career opportunities have a positive impact on choice of students. This finding is consistent with the findings of Wang *et al.* (2022). Similarly, the beta coefficients for career building opportunities are positive with choice of students. It indicates that career building opportunities have a positive impact on choice of students. This finding is similar to the findings of King and Bouchard (2011). Likewise, the beta coefficients for learning environment are positive with choice of students. It indicates that learning environment has a positive impact on choice of students. This finding is similar to the findings of Bezuidenhout *et al.* (2013). Further, the beta coefficients for number of specialization

fields are positive with choice of students. It indicates that number of specialization fields have a positive impact on choice of students. This finding is consistent with the findings of Drewes (2006). In addition, the beta coefficients for tuition fees are positive with choice of students. It indicates that tuition fees have a positive impact on choice of students. This finding is consistent with the findings of (Bezuidenhout *et al.*, 2013).

4. Summary and conclusion

Students' choices of engineering colleges are affected by several factors that highlight both institutional deficiencies and wider socio-economic difficulties. A significant issue is the disparity between student aspirations and the offerings of universities. Numerous schools neglect to offer contemporary facilities, unique specialties, or career-focused programs that student's desire, resulting in discontent and unfulfilled ambitions. Financial obstacles exacerbate the decision-making process, particularly for students from middle- or lower-income backgrounds who contend with elevated tuition rates and other costs such as housing and supplies. Despite the existence of scholarships and financial help, their accessibility is constrained for many, limiting chances for worthy individuals. A comprehensive knowledge of the quality of education at institutions is necessary. A comprehensive understanding of educational quality at colleges is crucial, since it directly influences students' capacity to get the information and skills required to become responsible and productive citizens. Quality education not only prepares individuals for personal and professional achievement but also significantly contributes to their holistic development as capable members of society. High-quality education aims to provide students with the information and skills necessary to become responsible and productive citizens. Quality is the primary competitive advantage for universities to recruit and retain student loyalty. Student enrollment is the most critical foundation for the success of any college. For universities, providing high-quality education is a crucial competitive advantage that aids in attracting and retaining students, so assuring enduring loyalty and reputation.

This study attempts to analyze the understanding the factors influencing students' choice of engineering schools of Kathmandu Valley. The study is based on primary data with 125 observations.

The major conclusion of this study is that career opportunities, capacity building opportunities, learning environment, number of specialization fields, and tuition fees are positively correlated to choice of students. It indicates that higher the career opportunities, capacity building opportunities, learning environment, number of specialization fields, and affordable tuition fees, higher would be the choice of the students towards engineering schools. The study also concluded that career opportunities followed by career building opportunities is the most influencing factor that explains the changes in the choice of students.

References

- Agrey, L., and N. Lampadan, 2014. Determinant factors contributing to student choice in selecting a university. *Journal of Education and Human Development* 3(2), 391-404.
- Arif, S., J. Iqbal, and U. Khalil, 2019. Factors influencing students' choices of academic career in Pakistan. *FWU Journal of Social Sciences* 13(1), 35-47.
- Bezuidenhout, G., J. W. De Jager, and V. Naidoo, 2013. Factors that influence students' choice of private higher education institutions. *South African Journal of Higher Education* 27(5), 1181-1196.
- Briggs, S., 2006. An exploratory study of the factors influencing undergraduate student choice: the case of higher education in Scotland. *Studies in Higher Education* 31(6), 705-722.
- Budur, T., C. A. Rashid, and M. Poturak, 2018. Students' perceptions on university selection, decision making

- process: A case study in Kurdistan Region of Iraq. *International Journal of Social Sciences and Educational Studies* 5(1), 133-144.
- Carnasciali, M. I., A. E. Thompson, and T. J. Thomas, 2013. Factors influencing students' choice of engineering major. In *2013 ASEE Annual Conference and Exposition* (pp. 23-587).
- Chavan, P., and M. Mehta, 2024. Uncovering students' higher education institutions selection: An investigation using factor analysis and cluster analysis. *Journal of Higher Education Policy and Leadership Studies* 5(1), 74-94.
- Cohen, J. M., 1995. Capacity building in the public sector: a focused framework for analysis and action. *International Review of Administrative Sciences* 61(3), 407-422.
- Connie, G., A. R. bin S Senathirajah, P. Subramanian, R. Ranom, and Z. Osman, 2022. Factors influencing students' choice of an institution of higher education. *Journal of Positive School Psychology* 6(4), 10015-10043.
- Dick, T. P., and S. F. Rallis, 1991. Factors and influences on high school students' career choices. *Journal for Research in Mathematics Education* 22(4), 281-292.
- Drewes, T., and C. Michael, 2006. How do students choose a university? An analysis of Applications to universities in Ontario, Canada. *Research in Higher Education* 47, 781-800.
- Gille, M., R. Moulignier, and K. Kövesi, 2022. Understanding the factors influencing students' choice of engineering school. *European Journal of Engineering Education* 47(2), 245-258.
- Gillis, A., and R. Ryberg, 2021. Is choosing a major choosing a career or interesting courses? An investigation into college students' orientations for college majors and their stability. *Journal of Postsecondary Student Success* 1(2), 46-71.
- Gurung, S. K., R. Chapagain, and K. Thapa, 2023. Business student satisfaction: The role of academic and non-academic services in higher education institutions. *Journal of Business and Management* 7(02), 125-139.
- Gurung, S. K., R. Chapagain, D., Ranabhat, R. P. Baral, P. Bhandari, and S. Thapa, 2022. Institutional determinants of college choice decisions among business students in Nepal. *Journal of Education and Research* 12(2), 37-60.
- Jian, H. L., F. E. Sandnes, Y. P. Huang, and Y. M. Huang, 2010. Cultural factors influencing Eastern and Western engineering students' choice of university. *European Journal of Engineering Education* 35(2), 147-160.
- Kakkad, P., and M. M. Kamath, 2023. Tole of campus placement as determining factor for selection of college among students. *South India Journal of Social Sciences* 21(40), 77-85.
- King, M. B., and K. Bouchard, 2011. The capacity to build organizational capacity in schools. *Journal of Educational Administration* 49(6), 653-669.
- Matusovich, H. M., R. A. Streveler, and R. L. Miller, 2010. Why do students choose engineering? A qualitative, longitudinal investigation of students' motivational values. *Journal of Engineering Education* 99(4), 289-303.
- Miotto, G., C. Del-Castillo-Feito, and A. Blanco-González, 2020. Reputation and legitimacy: Key factors for higher education institutions sustained competitive advantage. *Journal of Business Research* 112, 342-353.
- Mohobelo, M. I., P. M. Mashinini, and B. N. Mushwana, 2022. Investigating and evaluating factors influencing undergraduate engineering students' choice of university. In *2022 IEEE IFEEES World Engineering Education Forum-Global Engineering Deans Council (WEEF-GEDC)* (pp. 1-4). IEEE.
- Mustafa, S. A. A., A. L. Sellami, E. A. A. Elmaghraby, and H. B. Al-Qassass, 2018. Determinants of college and university choice for high-school students in Qatar. *International Journal of Higher Education* 7(3),

1-15.

- Reed, B., and J. Case, 2003. Factors influencing learners' choice of mechanical engineering as a career. *African Journal of Research in Mathematics, Science and Technology Education* 7(1), 73-83.
- Sabir, R. I., W. Ahmad, R. U. Ashraf, and N. Ahmad, 2013. Factors affecting university and course choice: A comparison of undergraduate engineering and business students in Central Punjab, Pakistan. *Journal of Basic and Applied Scientific Research* 3(10), 298-305.
- Sadjail, S. I., D. Sansawi, and M. A. Matolo, 2022. Factors influencing students in choosing their college course. *Psychology and Education: A Multidisciplinary Journal* 3(8), 697-700.
- Shiel, C., W. Leal Filho, A. do Paço, and L. Brandli, 2016. Evaluating the engagement of universities in capacity building for sustainable development in local communities. *Evaluation and Program Planning* 54, 123-134.
- Siann, G., and M. Callaghan, 2001. Choices and barriers: Factors influencing women's choice of higher education in science, engineering and technology. *Journal of Further and Higher Education* 25(1), 85-95.
- Sidin, S. M., S. R. Hussin, and H. S. Tan, 2003. An exploratory study of factors influencing the college choice decision of undergraduate students in Malaysia. *Asia Pacific Management Review* 8(3), 259-280.
- Silwal, P. P., and R. K. Baral, 2021. Factors influencing college choice of Nepalese undergraduate students. *Quest Journal of Management and Social Sciences* 3(2), 229-244.
- Stephen, M., and A. B. Makotose, 2007. A study into the factors that influence female engineering students' career choice: a case study of Mutare Polytechnic, Zimbabwe. *Scientific Research and Essay* 2(6), 211-216.
- Sudarshan, K. C., B. Maharjan, and R. Maharjan, 2024. Factors affecting students on enrollment in higher educational institutions (HEIs). *Shahid Kirti Multidisciplinary Journal* 2(2), 1-17.
- Talib, J. A., A. Salleh, S. Amat, S. Ghavifekr, and A. M. Ariff, 2015. Effect of career education module on career development of community college students. *International Journal for Educational and Vocational Guidance* 15, 37-55.
- Thoonen, E. E., P. J. Sleegers, F. J. Oort, and T. T. Peetsma, 2012. Building school-wide capacity for improvement: The role of leadership, school organizational conditions, and teacher factors. *School Effectiveness and School Improvement* 23(4), 441-460.
- Wang, X. H., H. P. Wang, and W. Y. Lai, 2022. Sustainable career development for college students: An inquiry into SCCT-based career decision-making. *Sustainability* 15(1), 426-431.
- Wiswall, M., and B. Zafar, 2015. Determinants of college major choice: Identification using an information experiment. *The Review of Economic Studies* 82(2), 791-824.
- Workman, J. L., 2015. Parental influence on exploratory students' college choice, major, and career decision making. *College Student Journal* 49(1), 23-30.
- Xu, Y. J., 2013. Career outcomes of STEM and non-STEM college graduates: Persistence in majored-field and influential factors in career choices. *Research in Higher Education* 54, 349-382.
- Yazici, S., and A. Yazici, 2010. Students' choice of college major and their perceived fairness of the procedure: evidence from Turkey. *Educational Research and Evaluation* 16(4), 371-382.
- Yusuf, B. N. M., M. Q. M. Ghazali, and M. F. S. Abdullah, 2017. Factors influencing local and international student's decision in choosing public higher learning institutions in northern region of Malaysia. *International Journal of Social Sciences* 48(1), 29-41.

Chapter 2

Role of artificial intelligence in enhancing customer service and efficiency in Nepalese banking sector

- Saajan Bhattarai and Sumit Pradhan*

Abstract

This study examines the role of artificial intelligence in enhancing customer service and efficiency in Nepalese banking sector. Customer satisfaction and service efficiency are the selected dependent variable. The selected independent variables are experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility. The primary source of data is used to assess the opinions of the respondents regarding experience with chatbots, response time, trust in chatbots, perceived usefulness, perceived compatibility, customer satisfaction, and service efficiency. The study is based on primary data of 150 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of role of artificial intelligence in enhancing customer service and efficiency in Nepalese banking sector.

The study showed that experience with chatbots has a positive impact on customer satisfaction and service efficiency. It indicates that automate customer interactions in a friendly and familiar way leads to increase in customer satisfaction and service efficiency. Similarly, response time has a positive impact on customer satisfaction and service efficiency. It indicates that quick response time enhances customer satisfaction and service efficiency. Likewise, trust in chatbots has a positive impact on customer satisfaction and service efficiency. It indicates that higher the trust in chatbots, higher would be the customer satisfaction and service efficiency. In addition, perceived usefulness has a positive impact on customer satisfaction and service efficiency. It indicates that high perceived usefulness leads to increase in customer satisfaction and service efficiency. Further, perceived compatibility has a positive impact on customer satisfaction and service efficiency. It indicates that high perceived compatibility leads to increase in customer satisfaction and service efficiency.

Keywords: experience with chatbots, response time, trust in chatbots, perceived usefulness, perceived compatibility, customer satisfaction, service efficiency

1. Introduction

The development and implementation of innovations in various areas of business is stimulated by the competitive market environment. The use of artificial intelligence technologies for business process transformation is one of the most promising areas. Artificial intelligence is conducive to not only increasing the business process efficiency, but also to reducing the companies' costs required for business process implementation. Artificial intelligence also contributes to reducing the need for human resources to perform routine operations (Al-Ababneh *et al.*, 2023). The digital technologies are increasingly developing, thus entailing their widespread use in various aspects of companies' operation. The introduction of artificial intelligence (AI) in the business process implementation or transformation is the best practice. Artificial intelligence and machine learning (ML) technologies can completely replace humans in certain operations. Moreover, artificial intelligence can perform certain types of operations much faster and with higher efficiency. This urges evaluation of the results and effects of the introduction of artificial intelligence in companies' operation. Artificial Intelligence (AI) is indeed a technique that is increasingly evolving throughout the worldwide and banking industry has become one of its earliest users. From manufacturing to service industries, AI have been a part of the company, in this modern era, where everything is handled by means of computers or human computer interface. AI is not a new innovation, but it has grown exponentially in recent years, catering a lot for sustainable

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growth. Customized customer platform offers quantitative benefits in the form of reduced costs, highly efficient human resources and enhanced customer engagement outcomes. AI is growing, however there are barriers to support and maintain since it can deal with possible biases or accountability of senior executives and government legislations. Big data is a channel to AI's service and Virtual reality cannot operate without data (Makhija and Chacko, 2021).

Financial institutions use artificial intelligence to assess the borrowers' risks when issuing loans, while insurance companies involve it in assessing market insurance contracts. Moreover, artificial intelligence is used to automate the company-client communication. Asset management companies and commercial agents use artificial intelligence to detect signals of underestimated or overestimated profitability of financial assets in the market. Therefore, as a significant number of reputable international organizations maintain, the introduction of artificial intelligence into business practice is one of the leading trends in the development of modern business, including the banking and financial sectors. Artificial intelligence can significantly improve the current state of financial services sector. Artificial intelligence can be used in the financial services sector for online trading on currency exchanges, asset portfolio creation and optimization, models verification and testing. Besides, there is a space for activities in the field of client service, including online consultations and assistance in resolving issues (Soni, 2019). Artificial intelligence can also be used to assess regulatory compliance and stress testing. The use of artificial intelligence by financial companies in anti-fraud and cybersecurity is no less important. Artificial intelligence can detect fraud attempts, while machine learning helps to update and modernize the detection algorithm. Chatbots are one of the most successful ways of introducing artificial intelligence into the practice of improving banking operations. Chatbots are considered as an effective tool for improving business-customer interaction (Balan, 2023).

Satheesh *et al.* (2020) assessed how AI-induced chatbots improve customer interaction and how chatbots play an essential role in customer relationship management in the banking industry. The study stated that AI induced chatbots have produced better conversations with the customers as per the recent studies. Hence, banking institutions should utilize this latest development to enhance customer service and customer loyalty. Similarly, Elegunde and Osagie (2020) examined artificial intelligence and employee performance in the Nigerian Banking Industry, Lagos Nigeria as a study to generalize result. The study revealed that Artificial Intelligence complements work process in banks in Nigeria and that machine-aided tasks ease operations in banks in Nigeria. Likewise, Folstad and Skjuve (2019) analyzed chatbots for customer service, user experience and motivation. The study found that the human likeness of chatbots for customer service, while potentially of some relevance for user experience, is dwarfed in importance compared to such chatbots' ability to efficiently and adequately handle enquiries. Further, Daqar and Smoudy (2019) examined the role of artificial intelligence (AI) on Enhancing Customer Experience in Palestine through different industries, such as banks and telecommunication companies. The study concluded that Customer Experience has two dimensions; Customer service and after-sale support, the study shows that AI predicted 22.9% of the variance of customer service, whereas it predicted 7% of After-Sale Support. Moreover, providing Personalized Customer Service throughout the customer's buying journey has a great impact on customer experience.

Belanche *et al.* (2019) proposed a research framework to better understand robo-advisor adoption by a wide range of potential customers. The study showed that the influences of perceived usefulness and attitude are slightly higher for users with a higher level of familiarity with robots; in turn, subjective norms are significantly more relevant for users with a lower familiarity and for customers from Anglo-Saxon countries. Similarly, Trivedi (2019) examined the effect of the three quality dimensions of the information system success model on customer experience, further leading to love for the bank brand. The study showed that perceived risk reduces the impact of the three quality

dimensions on customer experience. The consumers using banking chatbots expect it to be easy to use and respond to their queries in the shortest time, failing which the consumers' experience will be impaired.

Ayswarya (2024) examined the role of chatbot in customer care service in ICICI bank in Coimbatore city. The study found that various services like product advisory, financial, customer oriented and website services are the services that have a good role place of chatbot and thus relationship with them is strengthened leading to loyalty. Similarly, AlAmayreh *et al.* (2023) examined the perception of investors toward the factors of Artificial Intelligence (AI) that impact behavioral intention of AI adoption. The results demonstrated the significant impact of trust in service and subjective norms on AI. Attitudes, perceived ease of use and perceived usefulness showed statistical significance toward intention to use AI. The results also showed significant impact of training on perceived ease of use. AI is an automated investment tool to facilitate investors in making investments. Likewise, Al-Ababneh *et al.* (2023) analyzed the performance of artificial intelligence technologies in banking institutions. The results of the study demonstrated practical advantages of using artificial intelligence, which entail savings of working time and financial resources. The results confirmed that the labor productivity of the bank branch employees has increased due to the automation of processes implemented through the artificial intelligence systems and technologies.

Ramagundam (2023) assessed how artificial intelligence (AI), chatbots, and information mining especially affected the broadband network service quality in India. The study concluded that artificial intelligence has an impact on the quality of service provided in India in light of these findings. In addition, Dwivedi and Kochhar (2023) examined employees' attitudes towards the utilization of Artificial Intelligence (AI) in the Indian Banking Sector. The study concluded that positive responses highlight AI's contributions in areas like accounting, sales, contracts, and cybersecurity. Conversely, some employees express concerns about job security and advocate for enhanced training and upskilling opportunities. Moreover, Busayo *et al.* (2023) evaluated the effect of AI on the service quality of telecommunications companies in Nigeria, specifically the effect of data mining, machine learning, and chatbots on the service quality of these firms. The study revealed that data mining and chatbots exhibited a significant positive effect while machine learning showed a negative relationship to the service quality of the telecommunications industry.

In the context of Nepal, Shrestha *et al.* (2022) revealed that there is a positive response stating yes there is significant role of Chatbot on enhancing the customer experience. As bank are customer centric, their ultimate goal is customer satisfaction which can be achieved through better customer experience. In today's digitally equipped banking environment, a Chatbot is one of the services that improves consumer engagement. Consumers, for example, like to use Chatbot services to see, search, contact, and inquire about various things. Because individualized and personalized services needs be offered, Chatbots appear to be more user-friendly than traditional banking. To deliver an excellent customer experience, a Chatbot can respond quickly to client questions. In most cases, bank customers receive immediate help via Chatbots 24X7, rather than waiting for an answer through email or a human assistant. Bots are tone-trained to respond appropriately to clients and are shown to be more thoughtful and empathic than humans. Likewise, Gurung and Parajuli (2024) revealed that chatbots significantly meet customer expectations, thereby improving efficiency and satisfaction. Moreover, Karki *et al.* (2024) assessed the potential of AI in revolutionizing Nepal's digital marketing landscape, identifying both the opportunities it presents and the challenges it faces in a developing market context. The study revealed a significant potential for AI to transform digital marketing in Nepal by offering personalized customer experiences and improving operational efficiencies. The study also addresses the challenges unique to Nepal, such as limited digital literacy, data privacy concerns, and infrastructural constraints.

The above discussion shows that empirical evidences vary greatly across the studies on the role of artificial intelligence in enhancing customer service and efficiency in banking sector. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the role of artificial intelligence in enhancing customer service and efficiency in Nepalese banking sector. Specifically, it examines the relationship of experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility with customer satisfaction and service efficiency in the context of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 150 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on experience with chatbots, response time, trust in chatbots, perceived usefulness, perceived compatibility, customer satisfaction, and service efficiency. The study is based on descriptive and causal comparative research designs.

The model

The model estimated in this study assumes that customer satisfaction and service efficiency depend on experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility. Therefore, the model takes the following form:

$$CS = \beta_0 + \beta_1 EC + \beta_2 RT + \beta_3 TC + \beta_4 PU + \beta_5 PC + \epsilon$$

$$SE = \beta_0 + \beta_1 EC + \beta_2 RT + \beta_3 TC + \beta_4 PU + \beta_5 PC + \epsilon$$

Where,

CS = Customer satisfaction

SE = Service efficiency

EC = Experience with chatbots

RT = Response time

TC = Trust in chatbots

PU = Perceived usefulness

PC = Perceived compatibility

Customer satisfaction was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include "Quick response times from chatbots lead to higher customer satisfaction and reduced wait times", "Personalization in chatbot interactions boosts customer satisfaction by delivering tailored experiences" and so on. The reliability of the items was measured by computing the Cronbach's

alpha ($\alpha = 0.877$).

Service efficiency was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Chatbots provide 24/7 customer service, enhancing overall service efficiency”, “Chatbots improve accuracy and consistency in responses, reducing errors” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.828$).

Experience with Chatbots was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Chatbots provide instant responses, enhancing customer service efficiency”, “Chatbots can handle repetitive inquiries, freeing up human agents for complex tasks” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.765$).

Response time was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Quick response time enhances user satisfaction”, “Optimizing response time improves system efficiency” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.749$).

Trust in Chatbots was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Consistency in responses builds user trust in chatbots”, “Secure handling of personal data is crucial for maintaining trust” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.824$).

Perceived usefulness was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Perceived usefulness measures how effective a user believes a system will be in enhancing their job performance”, “Improvements in system features can increase its perceived usefulness” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.834$).

Perceived compatibility was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “1. High perceived compatibility can lead to quicker adoption of a new technology”, “Perceived compatibility can influence customer satisfaction and loyalty” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.820$).

The following section describes the independent variables used in this study along with the hypothesis formulation:

Experience with Chatbots

Chatbots play a crucial role in enhancing customer satisfaction and service efficiency. By providing immediate, accurate, and personalized responses, chatbots improve the customer experience. Simultaneously, their ability to handle high volumes of interactions, reduce operational costs, and streamline workflows contributes significantly to service efficiency. As technology advances, the integration of chatbots in customer service strategies is likely to become even more beneficial. Chen *et al.* (2021) assessed usability and responsiveness of artificial intelligence chatbot on online customer experience in e-retailing. The study revealed that usability and responsiveness of artificial intelligence

chatbot have positive effect on online customer experience in e-retailing. The study also revealed that experience with chatbots can significantly enhance customer satisfaction and service efficiency. Eren (2021) analyzed the determinants of customer satisfaction in chatbot use: evidence from a banking application in Turkey. The study revealed that past experience is crucial and plays significant role in increasing the level of customer satisfaction in chatbot use. Chatbots offer immediate responses to customer inquiries. This reduces the frustration associated with waiting for a human agent, thus improving the overall customer experience. Chatbots provide consistent answers and adhere to the company's guidelines which ensures that all customers receive the same level of service, reducing variability and increasing trust in the brand. Moreover, chatbots efficiently handle common and repetitive questions. It frees up human agents to handle more complex issues, improving the overall service quality. Chatbots can manage a large number of interactions simultaneously and reduces the burden on human agents, allowing them to focus on more demanding tasks, thus improving operational efficiency (Wahbi *et al.*, 2023). Implementing chatbots can lead to cost savings while maintaining or even improving service levels. Based on it, the study develops following hypothesis:

H₁: There is a positive relationship of experience with Chatbots with customer satisfaction and service efficiency.

Response time

According to Wahbi *et al.* (2023), the response time of chatbots is a pivotal element in boosting both customer satisfaction and service efficiency. Immediate responses create a positive customer experience by reducing wait times and ensuring quick resolution of queries. On the efficiency front, fast response times enable chatbots to handle a large volume of interactions seamlessly, optimizing resource utilization and reducing operational costs. As businesses continue to refine chatbot technology, the emphasis on response time will remain a key factor in achieving superior customer service and operational excellence (Magno and Dossena, 2023). The response time of chatbots is a critical factor that significantly influences both customer satisfaction and service efficiency. Customers receive instant replies to their inquiries. This immediate assistance reduces frustration and wait times, enhancing the overall customer experience and satisfaction. Zhang *et al.* (2024) revealed that customers perceive the service as more efficient and less effortful, leading to higher satisfaction. Fast responses keep the conversation flowing smoothly. This maintains customer engagement and prevents drop-offs during the interaction, ensuring that their needs are fully addressed. Quick and efficient service reflects well on the brand which enhances the customer's perception of the company as being responsive and customer-centric, fostering loyalty and positive word-of-mouth (Chung *et al.*, 2020). Chatbots can handle multiple queries simultaneously with quick turnaround times. It increases the volume of queries handled efficiently, reducing bottlenecks and improving overall service efficiency. It also increases the number of interactions handled per unit time, boosting the efficiency of customer service operations. Chatbots provide consistent and accurate responses quickly which enhances the customers receive reliable information promptly, reducing the need for follow-up queries and corrections. The chatbot instantly provides the tracking information, leading to a satisfied customer who appreciates the prompt service (Ashfaq *et al.*, 2020). Based on it, the study develops following hypothesis:

H₂: There is a positive relationship of response time with customer satisfaction and service efficiency.

Trust in chatbots

Trust in chatbots significantly impacts both customer satisfaction and service efficiency. Eren (2021) examined the determinants of customer satisfaction in chatbot use evidence from a banking application in Turkey. The study showed that trust and experience of chatbot have positive effect on

customer satisfaction in chatbot use. The study further argued that when customers trust a chatbot, they believe it will provide accurate and timely responses. This reliability enhances the user experience and satisfaction. Trustworthy chatbots can handle queries effectively, reducing frustration and improving overall user interaction. Trust in a chatbot's ability to secure personal information and maintain privacy leads to higher satisfaction levels. According to Hsu and Lin (2023), consistent performance and accurate information build trust over time, leading to positive customer experiences. Trustworthy chatbots are more likely to be used frequently, which can streamline customer service operations and reduce the workload on human agents. Customers are more inclined to use self-service options provided by chatbots they trust, leading to faster issue resolution and reduced service times. Trusted chatbots can handle a large volume of queries simultaneously, improving service efficiency and allowing businesses to scale operations without a proportional increase in staff. Efficient and trusted chatbots can reduce operational costs by decreasing the need for extensive human intervention (Nordheim *et al.*, 2019). Based on it, the study develops following hypothesis:

H₃: There is a positive relationship of trust in chatbots with customer satisfaction and service efficiency.

Perceived usefulness

Perceived usefulness of chatbots plays a crucial role in positively influencing customer satisfaction and service efficiency. By enhancing the perceived usefulness of chatbots, businesses can significantly boost customer satisfaction and service efficiency, leading to a more effective and rewarding customer service experience (Jenneboer *et al.*, 2022). Useful chatbots can quickly provide information or solutions, saving customers time and effort. This efficiency is highly valued, leading to increased satisfaction. A chatbot that is perceived as useful often has a well-designed interface and provides clear, helpful responses, making the interaction pleasant and satisfying. According to Cheng *et al.* (2022), the perceived usefulness of chatbots encourages their widespread use, enabling businesses to efficiently scale their customer service operations without a corresponding increase in costs. When customers find chatbots useful, they are more likely to use them for self-service. This reduces the burden on human agents and speeds up service delivery (Hsiao and Chen, 2022). Chatbots that can personalize responses based on user data are perceived as more useful, leading to a more tailored and satisfying customer experience. The availability of a useful chatbot around the clock ensures that customers can get assistance whenever they need it, significantly enhancing their overall experience (Ltifi, 2023). Based on it, the study develops following hypothesis:

H₄: There is a positive relationship of perceived usefulness with customer satisfaction and service efficiency.

Perceived compatibility

Perceived compatibility of chatbots, which refers to how well a chatbot fits with the user's existing values, needs, and experiences, has a significant impact on customer satisfaction and service efficiency (Naqvi *et al.*, 2024). Compatibility with user preferences and existing systems encourages more customers to use the chatbot, leading to a higher rate of self-service (Agnihotri and Bhattacharya, 2024). Integrated and compatible chatbots ensure that all customer interactions are logged consistently across systems, providing a holistic view of customer interactions and enabling better decision-making and service improvements. Sanny *et al.* (2020) analyzed customer satisfaction factors which influence chatbot acceptance in Indonesia. The results revealed that chatbots that align with the customer's existing knowledge and usage patterns make interactions more intuitive and less frustrating. This familiarity and ease of use lead to higher satisfaction levels. Compatibility ensures that the chatbot provides consistent experiences across various touchpoints, reinforcing trust and satisfaction. Chatbots that match users'

existing technological habits and language reduce the learning curve, making interactions smoother and more satisfying (Zhang *et al.*, 2024). Based on it, the study develops following hypothesis:

H₅: There is a positive relationship of perceived compatibility with customer satisfaction and service efficiency.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with mean and standard deviation has been computed and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 150 observations. The dependent variables are CS (Customer satisfaction) and SE (Service efficiency). The independent variables are EC (Experience with chatbots), RT (Response time), TC (Trust in chatbots), PU (Perceived usefulness), and PC (Perceived compatibility).

Variables	Mean	S.D.	CS	SE	EC	RT	TC	PU	PC
CS	3.415	0.639	1						
SE	3.564	0.699	0.445**	1					
EC	3.485	0.707	0.462**	0.225**	1				
RT	3.600	0.640	0.558**	0.382**	0.391**	1			
TC	3.789	0.584	0.393**	0.288**	0.254**	0.508**	1		
PU	3.255	0.491	0.293**	0.236**	0.222**	0.235**	0.125*	1	
PC	3.154	0.549	0.494**	0.407**	0.560**	0.281**	0.451**	0.458**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 1 shows that shows that experience with chatbots is positively correlated to customer satisfaction. It indicates that automate customer interactions in a friendly and familiar way leads to increase in customer satisfaction. Similarly, response time is positively correlated to customer satisfaction. It indicates that quick response time enhances customer satisfaction. Likewise, trust in chatbots is positively correlated to customer satisfaction. It indicates that higher the trust in chatbots, higher would be the customer satisfaction. Further, perceived usefulness is positively correlated to customer satisfaction. It indicates that high perceived usefulness leads to increase in customer satisfaction. In addition, perceived compatibility is positively correlated to customer satisfaction. It indicates that high perceived compatibility leads to increase in customer satisfaction.

Similarly, the study also shows that experience with chatbots is positively correlated to service efficiency. It indicates that automate customer interactions in a friendly and familiar way leads to increase in service efficiency. Similarly, response time is positively correlated to service efficiency. It indicates that quick response time enhances service efficiency. Likewise, trust in chatbots is positively correlated to service efficiency. It indicates that higher the trust in chatbots, higher would be the service efficiency. Further, perceived usefulness is positively correlated to service efficiency. It indicates that high perceived usefulness leads to increase in service efficiency. In addition, perceived compatibility is positively correlated to service efficiency. It indicates that high perceived compatibility leads to

increase in service efficiency.

Regression analysis

Having analyzed the Kendall's Tau correlation coefficients matrix, the regression analysis has been carried out and the results are presented in Table 1. More specifically, it presents the regression results of experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility on customer satisfaction.

Table 2

Estimated regression results of experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility on customer satisfaction

The results are based on 150 observations using linear regression model. The model is $CS = \beta_0 + \beta_1 EC + \beta_2 RT + \beta_3 TC + \beta_4 PU + \beta_5 PC + \epsilon$, where the dependent variable is CS (Customer satisfaction). The independent variables are EC (Experience with chatbots), RT (Response time), TC (Trust in chatbots), PU (Perceived usefulness), and PC (Perceived compatibility).

Model	Intercept	Regression coefficients of					Adj. R _{bar} ²	SEE	F-value
		EC	RT	TC	PU	PC			
1	2.899 (12.726)**	0.172 (2.377)*					0.030	0.653	5.648
2	2.740 (11.845)**		0.474 (3.040)**				0.052	0.645	9.242
3	1.733 (7.185)**			0.458 (7.148)**			0.252	0.573	51.100
4	1.370 (5.34)**				0.568 (8.152)**		0.305	0.552	66.418
5	2.502 (11.946)**					0.295 (4.547)**	0.117	0.623	20.674
6	2.260 (7.333)**	0.163 (2.321)*	0.215 (2.992)**				0.080	0.636	7.451
7	1.238 (3.871)**	0.118 (1.863)	0.093 (1.392)	0.417 (6.242)**			0.269	0.567	19.236
8	0.789 (2.518)**	0.056 (0.934)	0.028 (0.428)	0.265 (3.777)**	0.387 (4.721)**		0.362	0.529	22.103
9	0.629 (1.962)*	0.049 (0.822)	0.031 (0.494)	0.234 (3.307)**	0.360 (4.377)**	0.360 (4.377)**	0.376	0.524	18.960

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Customer satisfaction is the dependent variable.

Table 2 shows that the beta coefficients for experience with Chatbots are positive with customer satisfaction. It indicates that experience with Chatbots has a positive impact on customer satisfaction. This finding is consistent with the findings of Eren (2021). Similarly, the beta coefficients for response time are positive with customer satisfaction. It indicates that response time has a positive impact on customer satisfaction. This finding is similar to the findings of (Chung *et al.*, 2020). Likewise, the beta coefficients for trust in Chatbots are positive with customer satisfaction. It indicates that trust in Chatbots has a positive impact on customer satisfaction. This finding is similar to the findings of (Nordheim *et al.*, 2019). Further, the beta coefficients for perceived usefulness are positive with customer satisfaction. It indicates that perceived usefulness has a positive impact on customer satisfaction. This finding is consistent with the findings of (Ltifi, 2023). In addition, the beta coefficients for perceived compatibility are positive with customer satisfaction. It indicates that perceived compatibility has a positive impact on customer satisfaction. This finding is consistent with the findings of Sanny *et al.*

(2020).

Table 3 shows the regression results of experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility on service efficiency.

Table 3

Estimated regression results of experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility on service efficiency

The results are based on 150 observations using linear regression model. The model is $SE = \beta_0 + \beta_1 EC + \beta_2 RT + \beta_3 TC + \beta_4 PU + \beta_5 PC + \varepsilon$, where the dependent variable is SE (Service efficiency). The independent variables are EC (Experience with chatbots), RT (Response time), TC (Trust in chatbots), PU (Perceived usefulness), and PC (Perceived compatibility).

Model	Intercept	Regression coefficients of					Adj. R_bar ²	SEE	F-value
		EC	RT	TC	PU	PC			
1	1.766 (7.500)**	0.463 (7.134)**					0.251	0.553	50.891
2	1.503 (8.521)**		0.159 (11.105)**				0.451	0.473	123.325
3	1.449 (7.011)**			0.564 (9.702)**			0.385	0.501	94.123
4	0.961 (4.381)**				0.682 (11.356)**		0.462	0.468	128.962
5	1.607 (5.174)**					0.477 (5.888)**	0.184	0.577	34.664
6	1.626 (5.177)**						0.166	0.583	30.616
7	1.088 (5.143)**	0.206 (3.321)**	0.491 (8.281)**				0.486	0.458	71.354
8	0.426 (1.982)*	0.203 (3.695)**	0.327 (5.571)**	0.346 (6.360)**			0.595	0.407	73.816
9	0.192 (0.882)	0.171 (3.163)**	0.223 (3.468)**	0.279 (5.005)**	0.255 (3.457)**		0.623	0.392	62.504

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Service efficiency is the dependent variable.

Table 3 shows that the beta coefficients for experience with Chatbots are positive with service efficiency. It indicates that experience with Chatbots has a positive impact on service efficiency. This finding is consistent with the findings of Chen *et al.* (2021). Similarly, the beta coefficients for response time are positive with service efficiency. It indicates that response time has a positive impact on service efficiency. This finding is similar to the findings of (Magno and Dossena, 2023). Likewise, the beta coefficients for trust in Chatbots are positive with service efficiency. It indicates that trust in Chatbots has a positive impact on service efficiency. This finding is similar to the findings of Eren (2021). Further, the beta coefficients for perceived usefulness are positive with service efficiency. It indicates that perceived usefulness has a positive impact on service efficiency. This finding is consistent with the findings of (Jenneboer *et al.*, 2022). In addition, the beta coefficients for perceived compatibility are positive with service efficiency. It indicates that perceived compatibility has a positive impact on service efficiency. This finding is consistent with the findings of Sanny *et al.* (2020)

4. Summary and conclusion

Artificial intelligence (AI) is a powerful technology that can enhance the banking and financial sector by providing various opportunities, such as robo-advice, personal data protection, fraud detection, and customer behavior analysis. However, AI also poses some challenges, such as high cost, unemployment, cybercrime, and lack of transparency and explainability. Artificial intelligence (AI) is a promising technology that can perform various functions associated with human minds, such as reasoning, learning, interacting, creating, perceiving, and problem-solving. AI can also handle large volumes of structured and unstructured data, extract useful patterns and insights, and control individual human behavior, inference methods, and knowledge representation. However, AI also has some limitations and risks, such as ethical, legal, social, and technical aspects. Customer interaction is one of the key aspects of customer service, as it can influence customer satisfaction, loyalty, and retention. However, customer interaction can also be challenging, as customers have different needs, preferences, and expectations. Moreover, customer interaction can be costly and time-consuming for businesses, especially when dealing with large volumes of inquiries or complaints. Therefore, many businesses are looking for ways to leverage artificial intelligence (AI) to improve customer interaction and create more delightful experiences.

This study attempts to analyze the role of artificial intelligence in enhancing customer service and efficiency in Nepalese banking sector. The study is based on primary data with 150 observations.

The major conclusion of this study is that experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility have a positive impact on customer satisfaction and service efficiency. It indicates that higher the experience with chatbots, response time, trust in chatbots, perceived usefulness, and perceived compatibility, higher would be the customer satisfaction and service efficiency. The study also concluded that perceived usefulness followed by response time is the most influencing factor that explains the changes in the customer satisfaction. Likewise, the study also concluded that perceived usefulness followed by trust in chatbots is the most influencing factor that explains the changes in the service efficiency.

References

- Agnihotri, A., and S. Bhattacharya, 2024. Chatbots' effectiveness in service recovery. *International Journal of Information Management* 76, 102-116.
- Al-Ababneh, H., V. Borisova, A. Zakharzhevskaya, P. Tkachenko, and N. Andrusiak, 2023. Performance of artificial intelligence technologies in banking institutions. *WSEAS Trans. Bus. Econ* 20, 307-317.
- AlAmayreh, E., D. Almajali, L. AlSmadi, R. E. Masadeh, A. Al-Sherideh, and S. Majali, 2023. Antecedents of understanding the investors' acceptance of artificial intelligence: Perceptions from Jordanian context. *International Journal of Data and Network Science* 7(4), 1861-1874.
- Ashfaq, M., J. Yun, S. Yu, and S. M. C. Loureiro, 2020. Chatbot: Modeling the determinants of users' satisfaction and continuance intention of AI-powered service agents. *Telematics and Informatics* 54(1), 101-114.
- Ayswarya, R., 2024. Role of chatbot in customer care services in banking sector. *Journal of the Oriental Institute* 72(50), 180-190.
- Balan, C., 2023. Chatbots and voice assistants: digital transformers of the company–customer interface-A systematic review of the business research literature. *Journal of Theoretical and Applied Electronic Commerce Research* 18(2), 995-1019.
- Belanche, D., L. V. Casalo, and C. Flavián, 2019. Artificial Intelligence in FinTech: understanding robo-advisors adoption among customers. *Industrial Management and Data Systems* 119(7), 1411-1430.
- Busayo, T., O. Igbekoyi, O. Oluwagbade, Y. Adewara, M. Dagunduro, and Y. Boluwaji, 2023. Artificial

- intelligence and service quality of telecommunication firms in Nigeria. *Journal of Economics, Finance and Accounting Studies* 5(3), 203-214.
- Chen, J. S., T. T. Y. Le, and D. Florence, 2021. Usability and responsiveness of artificial intelligence chatbot on online customer experience in e-retailing. *International Journal of Retail and Distribution Management* 49(11), 1512-1531.
- Cheng, X., X. Zhang, J. Cohen, and J. Mou, 2022. Human vs. AI: Understanding the impact of anthropomorphism on consumer response to chatbots from the perspective of trust and relationship norms. *Information Processing and Management*, 59(3), 102940.
- Chung, M., E. Ko, H. Joung, and S. J. Kim, 2020. Chatbot e-service and customer satisfaction regarding luxury brands. *Journal of Business Research* 117(2), 587-595.
- Daqar, M. A. A., and A. K. Smoudy, 2019. The role of artificial intelligence on enhancing customer experience. *International Review of Management and Marketing* 9(4), 22-31.
- Dwivedi, A., and K. Kochhar, 2023. Employee's attitude towards artificial intelligence in the Indian banking sector. *International Journal of Professional Business Review* 8(11), 6-15.
- Elegunde, A. F., and R. Osagie, 2020. Artificial intelligence adoption and employee performance in the Nigerian banking industry. *International Journal of Management and Administration* 4(8), 189-205.
- Eren, B. A., 2021. Determinants of customer satisfaction in chatbot use: evidence from a banking application in Turkey. *International Journal of Bank Marketing* 39(2), 294-311.
- Gurung, D., and P. Parajuli, 2024. Impact of chatbot in operational efficiency in banking sector In Nepal. *LBEF Research Journal of Science, Technology and Management* 6(1), 82-105.
- Hsiao, K. L., and C. C. Chen, 2022. What drives continuance intention to use a food-ordering chatbot? An examination of trust and satisfaction. *Library Hi Tech* 40(4), 929-946.
- Hsu, C. L., and J. C. C. Lin, 2023. Understanding the user satisfaction and loyalty of customer service chatbots. *Journal of Retailing and Consumer Services* 71, 103-121.
- Jenneboer, L., C. Herrando, and E. Constantinides, 2022. The impact of chatbots on customer loyalty: A systematic literature review. *Journal of Theoretical and Applied Electronic Commerce Research* 17(1), 212-229.
- Karki, S., B. R. Aryal, S. Karki, and K. Acharya, 2024. Artificial intelligence for digital marketing transformation in Nepal: A Review. *International Journal of Innovative Science, Engineering and Technology* 11(2), 87-102.
- Ltifi, M., 2023. Trust in the chatbot: a semi-human relationship. *Future Business Journal* 9(1), 109-123.
- Magno, F., and G. Dossena, 2023. The effects of chatbots' attributes on customer relationships with brands: PLS-SEM and importance-performance map analysis. *The TQM Journal* 35(5), 1156-1169.
- Makhija, P., and E. Chacko, 2021. *Fourth Industrial Revolution and Business Dynamics: Issues and Implications*. London: Palgrave Macmillan.
- Naqvi, M. H. A., Z. Hongyu, M. H. Naqvi, and L. Kun, 2024. Impact of service agents on customer satisfaction and loyalty: mediating role of Chatbots. *Journal of Modelling in Management* 19(2), 470-491.
- Nordheim, C. B., A. Følstad, and C. A. Bjørkli, 2019. An initial model of trust in chatbots for customer service. Findings from a questionnaire study. *Interacting with Computers* 31(3), 317-335.
- Ramagundam, S., 2023. Improving service quality with artificial intelligence in broadband networks. *International Neuropsychology Journal* 27(4), 1406-1414.

- Sanny, L., A. Susastra, C. Roberts, and R. Yusramdaleni, 2020. The analysis of customer satisfaction factors which influence chatbot acceptance in Indonesia. *Management Science Letters* 10(6), 1225-1232.
- Satheesh, M. K., N. Samala, and R. V. Rodriguez, 2020. Role of Ai-induced chatbot in enhancing customer relationship management in the banking industry. *ICTACT Journal on Management Studies* 6(4), 1320-1323.
- Shrestha, R., J. M. Chatterjee, and H. N. Parajuli, 2022. The scope of ai-embedded chatbot for customer interaction in banking industry of Nepal. *LBEF Research Journal of Science, Technology and Management* 4(1), 1-15.
- Soni, V. D., 2019. Role of artificial intelligence in combating cyber threats in banking. *International Engineering Journal for Research and Development* 4(1), 7-7.
- Trivedi, J., 2019. Examining the customer experience of using banking chatbots and its impact on brand love: The moderating role of perceived risk. *Journal of internet Commerce* 18(1), 91-111.
- Wahbi, A., K. Khaddouj, and N. Lahlimi, 2023. Study of the relationship between chatbot technology and customer experience and satisfaction. *International Journal of Accounting, Finance, Auditing, Management and Economics* 4(6-1), 758-771.
- Zhang, J., Q. Chen, J. Lu, X. Wang, L. Liu, and Y. Feng, 2024. Emotional expression by artificial intelligence chatbots to improve customer satisfaction: Underlying mechanism and boundary conditions. *Tourism Management* 100(1), 48-53.

Chapter 3

Customer experience regarding fintech in the context of Nepalese commercial banks

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Abstract

This study examines the customer experience regarding fintech in the context of Nepalese commercial banks. Customer experience in Fintech is the selected dependent variable. The selected independent variables are ease of use, perceived value, customer support, assurance, speed, and perceived firm innovativeness. The primary source of data is used to assess the opinions of the respondents regarding ease of use, perceived value, customer support, assurance, speed, perceived firm innovativeness, and customer experience in Fintech. The study is based on primary data of 145 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of customer experience regarding fintech in the context of Nepalese commercial banks.

The study showed that ease of use has a positive impact on customer experience in Fintech. It indicates that higher the ease of use, higher would be the customer experience in Fintech. Similarly, perceived value has a positive impact on customer experience in Fintech. It indicates that perceived value influences customer experience by shaping expectations regarding the usefulness and effectiveness of financial products. Likewise, customer support has a positive impact on customer experience in Fintech. It indicates that effective customer support in Fintech enhances overall customer experience by providing timely assistance. In addition, assurance has a positive impact on customer experience in Fintech. It indicates that assurance in Fintech enhances customer trust and confidence. Further, speed has a positive impact on customer experience in Fintech. It indicates that speedy response to customer inquiries enhances the overall experience in Fintech services. In addition, perceived firm innovativeness has a positive impact on customer experience in Fintech. It indicates that perceived firm innovativeness in Fintech positively influences customer experience.

Keywords: ease of use, perceived value, customer support, assurance, speed, perceived firm innovativeness, customer experience in Fintech

1. Introduction

FinTech represents a set of innovative services, supported by advances in information and communication technology. The fintech sector includes innovative companies that offer financial services based on technology. Fintech services are to be found in a variety of industries such as: mobile payments, e-commerce, portfolio management, risk management, customized consulting, virtual currencies, systems integration, and others. The financial crisis of 2008 concurred to the growth of FinTech industry, as consumers experienced difficulties in accessing traditional financial services (Knight & Wojcik, 2020). Fintech contributes to democratize access to financial services, which is beneficial for financial inclusion in developing markets. Non-bankable categories of people and small companies can access microloans thus improving their experience with financial services. FinTech relies on advanced technologies, such as the internet of things, artificial intelligence (AI), block chain, near field communication (NFC), mobile wallets, and others (Lim *et al.*, 2019). It is estimated that these technologies will contribute to the development of fintech services, by facilitating data and information collection, democratized access, prompt delivery of services. Based on information and communication technologies, more and more financial transactions will be implemented electronically, without human mediation (Weichert, 2017).

Innovation in the financial services realm is happening at an ever-increasing pace. FinTech firms across the globe are playing a major role in using new technologies and new business models to better align payments solutions with customer needs. Transformation is accelerating due to broad

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global trends around connected devices and mobility as well as shifts in demographics and customer expectations. Shifting security concerns and point of-sale technology changes further reinforce the environment of change. Financial technology (Fintech) services using emerging technology such as the Internet of Things (IoT) is becoming more prevalent. The recent proliferation of the mobile payment sector led by innovative mobile Fintech payment services are the most important and fastest growing Fintech services from consumers' perspective. Although businesses have been making efforts to spread the use of the services, security is crucial in the diffusion of the services. Despite the importance, the role of perceived security in continuous intention to use mobile, Fintech services has not yet been investigated in depth. Thus, this study investigates the relationships between perceived ease of use, perceived value, customer support, assurance, speed, perceived firm innovativeness, and knowledge regarding the services, confirmation, perceived usefulness, and satisfaction. Many countries like Nepal lack the necessary infrastructure for widespread adoption of fintech solutions. This includes reliable internet connectivity, banking infrastructure, and digital literacy among the population. Fintech may exacerbate existing inequalities in developing countries. Those who are already financially excluded may not have access to the technology or the knowledge to use fintech services effectively. With the digitization of financial services comes the risk of cybersecurity threats. Many countries may not have robust cybersecurity measures in place to protect against fraud and data breaches. Fintech solutions often require access to smartphones or computers, which not everyone in developing countries may have. This creates a digital divide, further marginalizing certain segments of the population. In Nepal, the growth in mobile banking is strong, especially among the young who are aware of technological developments and are willing to accept mobile banking services and the benefits they bring. Indeed, several payment companies have received approval to operate in Nepal and have been adopted by the Nepalese population for bill and invoice payments (Bazarbash, 2020).

Shankar & Rishi (2020) explored how different dimensions of online convenience impact mobile banking (m-banking) adoption intention. The study showed that access convenience, transaction convenience, and possession/post-possession convenience predict m-banking adoption intention, with the chief driver being the possession/post-possession convenience. Similarly, Shiau *et al.* (2020) assessed the factors that could explain the level of fintech continuance intentions with an expectation confirmation model that integrates self-efficacy theory. The results showed that financial self-efficacy, technological self-efficacy and confirmation positively affect perceived usefulness. Likewise, Sayed & Sayed (2020) assessed the perception of the bank customers with respect to digital banking. The study revealed that the main reasons for customers to use cashless or digital transactions is that they are a faster way of performing transactions. The study also concluded that for some of the services offered by private and public sector banks, there is no significant difference in the experience levels of the customers. Further, Komulainen & Saraniemi (2019) examined how to improve customer value and to make mobile banking services a profitable business for banks and other financial actors. The study showed that mobile banking service creates value by replacing other services, affecting consumption behavior as well as by providing financial benefits, the ease of use of the user interface, real-time operation, flexibility and location-based content. In addition, Bajunaied *et al.* (2023) investigated and understand the consumers' behavioral intention toward FinTech services in Saudi Arabia. The findings suggested that FinTech service companies and practitioners should account for the privacy enablers on the broader level and to adopt a governance approach in developing reliable FinTech applications based on the information richness that can assist in developing trust amongst consumers. Moreover, Al Karim *et al.* (2023) investigated the impacts of Fintech services (such as e-payment service (EPS), Robo-advisory, Regtech service (RTS), and financing service (FS) on millennial customer engagement (CE) in the context of the private banking sector of Bangladesh. The study found that e-payment service, Robo-advisory, and FS positively impact customer engagement, while RTS was found insignificant with customer engagement.

Akmal *et al.* (2023) analyzed the perceptions of FinTech in the Middle East region, specifically its usage, and performance. The study found that FinTech enhances the performance of financial institutions and that digital banking is the best feature of FinTech across all customer groups. Similarly, Mosa (2022) examined the influence and correlation relationship between E-CRM and the customer experience in the field of E-banking service. The results showed that E-CRM is an important variable in building an experience that the customer sees as distinct. Likewise, Alnsour (2022) analyzed the impact of fintech over consumers loyalty intentions among Islamic banks. The study revealed that ease of use, perceived value, consumer support, assurance, speed, and innovativeness have positive impact on consumers loyalty intentions. Further, Shahid *et al.* (2022) examined the antecedents and outcomes of consumer experience (CX) with mobile banking (m-banking) apps. The findings revealed that convenience, trust, and social influence play a significant role in enhancing consumer experience with the m-banking app use. In addition, Saif *et al.* (2022) assessed customers' behavior, particularly regarding the adoption of digital-only banks. The results showed that convenience, economic efficiency, number of services, trust, perceived value, and environmental concern all have positive significant relationships with the intention to adopt digital-only banks. Further, environmental concern is the strongest indicator of behavioral intention. In contrast, functional and security risks have a negative but non-significant relationship with the intention to adopt digital-only banks. Finally, critical mass has a positive but non-significant effect on the behavioral intention. Moreover, Karim *et al.* (2022) explored the association between Fintech services and customer-loyalty intention in the hospitality sector in Bangladesh. The results of the study revealed that Fintech services, customer experience, and customer attitude significantly impacted customer-loyalty intention. Moreover, customer experience and customer attitude mediated the relationship between Fintech services and customer loyalty intention. The study found a positive association between users' attitudes and their intentions to use Fintech services in Taiwan.

Barbu *et al.* (2021) analyzed customer experience (CX) in the fintech sector. The results showed that perceived value, customer support, assurance, speed and perceived firm innovativeness are positively related to customer experience in fintech. Similarly, Zouari & Abdelhedi (2021) examined the impact of digitalization, as a service quality dimension, on customer satisfaction. The study demonstrated a positive and significant relationship between the main dimensions of customer service quality and customer satisfaction, except for tangibles. Likewise, Iqbal *et al.* (2021) examined the effects of quality of service, product awareness, and perceptions among customers of Islamic financial institutions (IFIs) on customer loyalty through technology integration using customer satisfaction as a mediator. The results revealed that the quality of customer services and awareness of IFIs have a direct and positive relationship with customer loyalty, which in turn was mediated by customer satisfaction. Further, Daragmeh *et al.* (2021) evaluated factors that influence Hungarian Generation X's behavioral intentions to use mobile payment services during the pandemic. The results showed that the model of perceived COVID-19 risk, perceived usefulness, subjective norms, and perceived ease of use explains 62.9% of the variance in intention to use mobile payment systems. In addition, Febrian *et al.* (2021) analyzed the effect of benefits offered and customer experience on the re-use of mobile banking through customer satisfaction and trust as mediating variables. The results showed that benefits offered and customer experience have a significant effect on satisfaction. Satisfaction has a significant impact on trust and re-use intention, and trust significantly affects re-use intention.

In the context of Nepal, Joshi (2023) investigated the customer satisfaction towards cybersecurity in e-banking of Nepalese commercial banks. The study showed that ease of use, security, responsiveness, trust and reliability have positive relationship with customer satisfaction. This indicates that increase in ease of use, security, responsiveness, trust and reliability leads to increase in customer satisfaction. The study concluded that reliability is the most influencing factors that explains the level

of customer satisfaction towards cybersecurity in e-banking of Nepalese commercial banks. Similarly, Thapa (2022) examined the impact of e-banking on customer convenience in the context of Nepalese commercial banks. The study revealed that ease of use has a positive impact on customer convenience. It implies that increase in ease of use of e-banking leads to increase in customer convenience. Moreover, responsiveness has a positive impact on customer convenience indicating that better responsiveness leads to increase in customer convenience. Likewise, Sah (2022) examined the relationship between internet banking and customer retention in Nepalese commercial banks. The study showed ease of use has a positive impact on consumer retention. This indicates that increase in the ease of use of internet banking, higher would be the consumer retention. In addition, responsiveness has a positive impact on consumer retention. It reveals that increase in level of responsiveness leads to an increase in customer retention. Furthermore, reliability has a positive impact on consumer retention. It implies that increase in reliability leads to an increase in customer retention. Further, Kunwar & Thakur (2019) examined how young customers of Nepal are reacting to the latest technological trend of mobile banking in the banking sector of Nepal.

The above discussion shows that empirical evidences vary greatly across the studies on the customer experience regarding FinTech in the context of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the customer experience regarding FinTech in the context of Nepalese commercial banks. Specifically, it examines the relationship of ease of use, perceived value, customer support, assurance, speed, and perceived firm innovativeness with customer experience in Fintech in the context of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 145 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on ease of use, perceived value, customer support, assurance, speed, perceived firm innovativeness, and customer experience in Fintech. The study is based on descriptive and causal comparative research designs.

The model

The model estimated in this study assumes that customer experience in Fintech depends on ease of use, perceived value, customer support, assurance, speed, and perceived firm innovativeness. Therefore, the model takes the following form:

$$CEFT = \beta_0 + \beta_1 EU + \beta_2 PV + \beta_3 CS + \beta_4 ASU + \beta_5 SPD + \beta_6 PFI + \epsilon$$

Where,

CEFT = Customer experience in fintech

EU = Ease of use

PV = Perceived value

CS = Customer support

ASU = Assurance

SPD = Speed

PFI = Perceived firm innovativeness

Customer experience in fintech was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Fintech platforms prioritize simplicity and ease of use, ensuring customers can navigate services effortlessly”, “Customers expect swift and efficient transactions, with Fintech platforms delivering near-instantaneous processing times” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.810$).

Ease of use was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Customer-centric features, such as personalized recommendations enhance the overall user experience”, “Continuous innovation and user feedback integration drive Fintech companies to constantly improve their services” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.787$).

Perceived value was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Perceived value influences customer experience by shaping expectations regarding the usefulness and effectiveness of financial products”, “Fintech companies that consistently deliver on their promised value proposition tend to foster better customer experiences” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.828$).

Customer support was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Effective customer support in Fintech enhances overall customer experience by providing timely assistance”, “Continuous feedback collection and analysis through customer support interactions help Fintech companies refine their services” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.756$).

Assurance was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Assurance in Fintech enhances customer trust and confidence”, “Quick and effective resolution of issues builds customer assurance leading to an improved overall experience in Fintech interactions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.794$).

Speed was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Faster transaction processing times in Fintech lead to improved customer satisfaction”, “Quick resolution of financial transactions fosters trust and loyalty among Fintech users” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.840$).

Perceived firm innovativeness was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Perceived firm innovativeness in Fintech positively influences customer experience”, “Higher levels of perceived innovativeness in Fintech firms are associated with enhanced customer satisfaction” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.834$).

The following section describes the independent variables used in this study along with the hypothesis formulation:

Ease of use

Ease of use rates how simple and smooth fintech apps are to operate. Ease of use contributes to the perceived control which, in turn, positively influences the affective dimension of the customer experience (Rose *et al.*, 2012). When accessing a fintech service, customers do not want to waste time learning to use the service or waiting for the completion of the service. Ease of use and perceived control are important elements in the financial environment of customers, being of greater importance for people who are low in technological readiness (Lee, 2009; Parasuraman, 2000). Less tech-savvy customers will have a low motivation to engage with fintech unless the perceived ease of use will not lead to manageable levels of mastering the fintech app. Ease of use helps reduce the anticipated stress of adopting a fintech service (Chuang *et al.*, 2016). Fintech companies favor ease of use through a multi-stage mechanism of conscientization, capacitation, incentivization, enrichment and cultivation (Ryu and Ko, 2020). Banking services are often accessible anytime, anywhere, through mobile apps or web portals. This accessibility enables customers to manage their finances conveniently on the go, without being tied to traditional banking hours or physical branches, contributing to a positive user experience. Based on it, the study develops following hypothesis:

H₁: There is a positive relationship between ease of use and customer experience in Fintech.

Perceived value

Perceived value can be understood by linking together the quality and price of a service (Fornell *et al.*, 1996). For fintech customers, costs can relate to time and money. The perceived value quantifies the benefit of the customer expressed in monetary terms (Agarwal and Teas, 2001). The higher the perceived value, the more relevant the customer experience (Mbama & Ezepue, 2018). Financial savings are among the most quoted benefits of companies in the fintech sector (Gomber *et al.*, 2018). Fintech companies are able to offer services at low prices due to an optimal cost structure, based on innovation and technological progress (Agarwal and Zhang, 2020). The perceived value is an important determinant of behavioral intentions to use banking services, including digital financial ones (Garg *et al.*, 2014). M-banking ubiquity and novelty seeking contribute to the perceived value, which is a prerequisite of the intention to continue to rely on mobile banking (Prodanova *et al.*, 2019). Ubiquity is important for fintech because it enables customers to perform financial operations anywhere and anytime. FinTech offer non-stop financial e-services, which saves customers' valuable time. Tech-skilled customers will embrace new technologies, provided a higher perceived value (Shiau *et al.*, 2020). Based on it, the study develops following hypothesis:

H₂: There is a positive relationship between perceived value and customer experience in Fintech.

Customer support

Customer support plays a crucial role in shaping the overall banking experience, especially in the realm of Fintech. Banks provide multiple channels for customer support, including live chat, email, and phone support, which enhances accessibility for users. This availability ensures that customers can reach out for assistance whenever they encounter issues or have inquiries, thereby improving their overall banking experience (Hoehle *et al.*, 2012). Through customer support, organizations help the customer when she or he has problems, being also responsible for relevant customer experience. The customer needs to feel reassured by the support of the fintech in the event of a potential problem, such as a possible financial loss. This requires prompt intervention to reassure the safety of the customers' investments (Parasuraman *et al.*, 2005). Other aspects of concern regard privacy issues and monetary considerations. FinTech must find suitable ways to overcome negative consequences and to gain customers' trust and loyalty by developing a relevant experience. FinTech are challenged to perform with agility in designing the most innovative technology-intensive services, while maintaining strong focus on the customer journey through the continuous dialog with their customers (Kotarba,

2016). The success of FinTech is also due to superior and personalized customer service as opposed to the traditional financial sector (Muthukannan *et al.*, 2020). Parise *et al.* (2016) revealed that quick resolution of issues and efficient handling of inquiries contribute to a positive banking experience, as customers appreciate timely assistance that minimizes disruptions to their financial activities. Based on it, the study develops following hypothesis:

H₃: There is a positive relationship between customer support and customer experience in Fintech.

Assurance

Assurance refers to protection of the customer personal and financial data when dealing with FinTech (Swaid & Wigand, 2009). Assurance, in terms of security, reliability, and trustworthiness, is paramount in the FinTech sector, especially within banks. Customers want to feel confident that their financial transactions and personal data are safe and protected when using fintech services. Banks that prioritize assurance by implementing robust security measures, ensuring reliability in their systems, and maintaining transparent communication with customers can significantly enhance the customer banking experience. Customers need to know that operations through FinTech are safe for them, and that personal data are protected, especially for e-financial transactions. Safety and trust contribute to the perception of a relevant customer experience (Zhou, 2013). FinTech rely on technologies to mitigate customer's perceived risks, theft of information, data violation and/or their fraudulent use (Yang *et al.*, 2015). In order to prevent such security leaks, FinTech implement multiple security checks: electronic keys, encryption and biometric identification, service, platform, network, and device security (Lim *et al.*, 2019). When customers have trust and confidence in their bank's fintech solutions, they are more likely to engage with them regularly, leading to higher satisfaction levels and stronger loyalty. This positive relationship between assurance and customer banking experience underscores the importance of building trust in the fintech banking sector. The availability of privacy and security policies, along with a good reputation should not be neglected (Tachiciu *et al.*, 2020). Where possible, FinTech might offer credential from a third party, regulatory or certification body. Based on it, the study develops following hypothesis:

H₄: There is a positive relationship between assurance and customer experience in Fintech.

Speed

Speed designates the performance of the FinTech service in a timely manner (Garg *et al.*, 2014). Speed plays a crucial role in shaping the customer banking experience. Fintech innovations like faster transaction processing, real-time data updates, and instant customer service responses have become increasingly important for customers who expect swift and seamless interactions with their financial institutions. Prompt delivery of the service is a key element of customer satisfaction. New Internet based technologies are increasing the speed of service delivery (Nicoletti, 2017). FinTech offer prompt and safe services (Weichert, 2017). Banks that prioritize speed in their fintech solutions can significantly enhance the overall customer experience by reducing wait times, improving efficiency, and increasing convenience. This positive relationship between speed and customer banking experience underscores the importance of technology-driven solutions in modern banking. Time is an important asset, especially because fintech services are used both by individuals and companies to gain efficiency and productivity. Customers engage with fintech companies to avoid travel to brick-and-mortar locations, to perform e-services and to benefit from the speed and ease of use associated with new technologies (Ryu and Ko, 2020). Perceived transaction speed influences the perceived effort to engage with FinTech, while the perceived transaction speed positively influences the behavioral intention to continue the relations with FinTech (Teo *et al.*, 2015). Based on it, the study develops following hypothesis:

H₅: There is a positive relationship between speed and customer experience in Fintech.

Perceived firm innovativeness

Perceived firm innovativeness encapsulates the attitude of customers regarding the company's ability to deliver new products and experiences (Kunz *et al.*, 2011). Innovation is often considered a key element of FinTech (Berman *et al.*, 2022). In the rapidly evolving landscape of fintech, customers often perceive firms that are innovative as more trustworthy and reliable. When banks prioritize innovation, they tend to offer better products, services, and experiences to their customers, thus enhancing the overall customer experience. This positive relationship between perceived firm innovativeness and customer experience can contribute to customer satisfaction, loyalty, and ultimately, the success of the fintech firm. A firm perceived by customers as innovative enjoys better ratings of its products, beneficiaries from greater consumer engagement, and can lead to consumer loyalty (Henard & Dacin, 2010). The development of innovative products stimulates customer experience. Innovation leads to cognitive and affective responses from consumers (Shams *et al.*, 2015). An innovative company is perceived as having technological leadership and, at the same time, can generate enthusiasm and optimism among customers. Market impact, expressed by products and services that incorporate better solutions to consumer problems, is a potential source of perceived innovation (Haddad & Hornuf, 2005). FinTech companies are recognized for their innovation capabilities, through which technology is used to develop personalized services, contributing to customer experience (Imerman & Fabozzi, 2020). Based on it, the study develops following hypothesis:

H₆: There is a positive relationship between Perceived firm innovativeness and customer experience in Fintech.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with mean and standard deviation has been computed and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 145 observations. The dependent variable is CEFT (Customer experience in Fintech). The independent variables are EU (Ease of use), PV (Perceived value), CS (Customer support), ASU (Assurance), SPD (Speed), and PFI (Perceived firm innovativeness).

Variables	Mean	S.D.	CEFT	EU	PV	CS	ASU	SPD	PFI
CEFT	3.613	1.034	1						
EU	3.256	1.021	0.582**	1					
PV	3.326	0.974	0.510**	0.644**	1				
CS	3.416	1.031	0.607**	0.660**	0.734**	1			
ASU	3.391	1.075	0.699**	0.592**	0.547**	0.608**	1		
SPD	3.465	1.055	0.601**	0.565**	0.567**	0.635**	0.710**	1	
PFI	3.447	1.058	0.586**	0.638**	0.663**	0.716**	0.675**	0.707**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 1 shows that ease of use is positively correlated to customer experience in Fintech. It means that higher the ease of use, higher would be the customer experience in Fintech. Similarly, perceived value is positively correlated to customer experience in Fintech. It implies that perceived value influences customer experience by shaping expectations regarding the usefulness and effectiveness of financial products. Likewise, customer support has a positive relationship with customer experience in

Fintech indicating that effective customer support in Fintech enhances overall customer experience by providing timely assistance. Further, assurance has a positive relationship with customer experience in Fintech. It implies that assurance in Fintech enhances customer trust and confidence. In addition, speed is positively correlated to the customer experience in Fintech indicating that speedy response to customer inquiries enhances the overall experience in Fintech services. Moreover, perceived firm innovativeness is positively correlated to the customer experience in Fintech. It indicates that perceived firm innovativeness in Fintech positively influences customer experience.

Regression analysis

Having analyzed the Kendall's Tau correlation coefficients matrix, the regression analysis has been carried out and the results are presented in Table 2. More specifically, it presents the regression results of ease of use, perceived value, customer support, assurance, speed, and perceived firm innovativeness on customer experience in Fintech.

Table 2

Estimated regression results of ease of use, perceived value, customer support, assurance, speed, and perceived firm innovativeness on customer experience in Fintech

The results are based on 145 observations using linear regression model. The model is $CEFT = \beta_0 + \beta_1 EU + \beta_2 PV + \beta_3 CS + \beta_4 ASU + \beta_5 SPD + \beta_6 PFI + \epsilon$, where the dependent variable is CEFT (Customer experience in Fintech). The independent variables are EU (Ease of use), PV (Perceived value), CS (Customer support), ASU (Assurance), SPD (Speed), and PFI (Perceived firm innovativeness).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		EU	PV	CS	ASU	SPD	PFI			
1	1.105 (5.419)**	0.770 (12.878)**						0.575	0.674	165.854
2	1.185 (4.880)**		0.730 (10.416)**					0.468	0.754	108.487
3	0.824 (4.366)**			0.817 (15.441)**				0.661	0.603	238.429
4	0.790 (5.072)**				0.833 (18.995)**			0.747	0.520	360.816
5	0.898 (4.636)**					0.015 (0.153)		0.637	0.623	214.646
6	0.813 (4.560)**						0.812 (16.418)**	0.688	0.578	269.565
7	0.845 (3.883)**	0.571 (6.364)**	0.730 (10.416)**					0.599	0.654	92.199
8	0.765 (3.952)**	0.298 (3.215)**	0.730 (10.416)**	0.698 (5.776)**				0.684	0.581	89.159
9	0.765 (3.952)**	0.173 (2.183)*	1.250 (1.352)	0.300 (0.299)	0.551 (7.302)**			0.781	0.484	109.597
10	0.571 (3.453)**	0.172 (2.166)*	1.260 (1.351)	0.294 (2.436)*	0.544 (5.987)**	0.015 (0.153)		0.779	0.486	86.957
11	0.571 (3.453)**	0.160 (2.011)*	1.520 (1.610)	0.243 (1.947)	0.544 (5.987)**	0.544 (5.987)**	0.185 (1.499)	0.781	0.483	73.610

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Customer experience in Fintech is the dependent variable.

Table 2 shows that the beta coefficients for ease of use are positive with customer experience in Fintech. It indicates that ease of use has a positive impact on customer experience in Fintech. This finding is similar to the findings of (Lee, 2009; Parasuraman, 2000). Likewise, the beta coefficients for perceived value are positive with customer experience in Fintech. It indicates that perceived value has a positive impact on customer experience in Fintech. This finding is consistent with the findings of (Garg *et al.*, 2014). Further, the beta coefficients for customer support are positive with customer experience in Fintech. It indicates that customer support has a positive impact on customer experience in Fintech. This finding is similar to the findings of Parise *et al.* (2016). In addition, the beta coefficients

for assurance are positive with customer experience in Fintech. It indicates that assurance has a positive impact on customer experience in Fintech. This finding is consistent with the findings of (Tachiciu *et al.*, 2020). Moreover, the beta coefficients for speed are positive with customer experience in Fintech. It indicates that speed has a positive impact on customer experience in Fintech. This finding is similar to the findings of (Teo *et al.*, 2015). Likewise, the beta coefficients for perceived firm innovativeness are positive with customer experience in Fintech. It indicates that perceived firm innovativeness has a positive impact on customer experience in Fintech. This finding is similar to the findings of (Haddad & Hornuf, 2005).

4. Summary and conclusion

Fintech represents a set of innovative services, supported by advances in information and communication technology. The Fintech sector includes innovative companies that offer financial services based on technology. Fintech services are to be found in a variety of industries such as: mobile payments, e-commerce, portfolio management, risk management, customized consulting, virtual currencies, systems integration, and others. The financial crisis of 2008 concurred to the growth of Fintech industry, as consumers experienced difficulties in accessing traditional financial services. Fintech contributes to democratize access to financial services, which is beneficial for financial inclusion in developing markets. Non-bankable categories of people and small companies can access microloans thus improving their experience with financial services. Fintech relies on advanced technologies, such as the internet of things, artificial intelligence (AI), blockchain, near field communication (NFC), mobile wallets, and others.

This study attempts to analyze the customer experience regarding FinTech in the context of Nepalese commercial banks. The study is based on primary data with 145 observations.

The major conclusion of this study is that ease of use, perceived value, customer support, assurance, speed, and perceived firm innovativeness have a positive impact on customer experience in Fintech. It indicates that higher the ease of use, perceived value, customer support, assurance, speed, and perceived firm innovativeness, higher would be the customer experience in Fintech. Likewise, the study also concluded that assurance followed by customer support is the most influencing factor that explains the changes in the customer experience in Fintech in the context of Nepalese commercial banks.

References

- Agarwal, S., & R. K. Teas, 2001. Perceived value: mediating role of perceived risk. *Journal of Marketing Theory and Practice* 9(4), 1-14.
- Agarwal, S., & J. Zhang, 2020. FinTech, lending and payment innovation: A review. *Asia-Pacific Journal of Financial Studies* 49(3), 353-367.
- Akmal, S., M. Talha, S. M. Faisal, M. Ahmad, & A. K. Khan, 2023. Perceptions about FinTech: New evidences from the Middle East. *Cogent Economics & Finance* 11(1), 22-36.
- Al Karim, R., M. K. Rabiul, A. Taskia, & T. Jarumaneerat, 2023. Millennial customer engagement with fintech services: the mediating role of trust. *Business Perspectives and Research* 2(1), 29-36.
- Alnsour, I. R., 2022. Impact of fintech over consumer experience and loyalty intentions: An empirical study on Jordanian Islamic Banks. *Cogent Business & Management* 9(1), 1-17.
- Bajunaied, K., N. Hussin, & S. Kamarudin, 2023. Behavioral intention to adopt FinTech services: An extension of unified theory of acceptance and use of technology. *Journal of Open Innovation: Technology, Market, and Complexity* 9(1), 1-3.
- Barbu, C. M., D. L. Florea, D. C. Dabija, & M. C. R. Barbu, 2021. Customer experience in fintech. *Journal of Theoretical and Applied Electronic Commerce Research* 16(5), 1415-1433.
- Bazarbash, M., 2020. Fintech in Nepal. *Nepal: Selected Issues*. Washington, DC: International Monetary Fund.

Asia and Pacific Department 2(1), 23-25.

- Berman, A., M. Cano-Kollmann, & R. Mudambi, 2022. Innovation and entrepreneurial ecosystems: fintech in the financial services industry. *Review of Managerial Science* 16(1), 45-64.
- Chuang, L. M., C. C. Liu, & H. K. Kao, 2016. The adoption of fintech service: TAM perspective. *International Journal of Management and Administrative Sciences* 3(7), 1-15.
- Daragmeh, A., C. Lentner, & J. Sági, 2021. FinTech payments in the era of COVID-19: Factors influencing behavioral intentions of “Generation X” in Hungary to use mobile payment. *Journal of Behavioral and Experimental Finance* 32(3), 1-12.
- Febrian, D., M. Simanjuntak, & N. Hasanah, 2021. The effect of benefits offered and customer experience on re-use intention of mobile banking through customer satisfaction and trust. *Jurnal Keuangan Dan Perbankan* 25(3), 551-569.
- Fornell, C., M. D. Johnson, E. W. Anderson, J. Cha, & B. E. Bryant, 1996. The American customer satisfaction index: nature, purpose, and findings. *Journal of Marketing* 60(4), 7-18.
- Garg, R., Z. Rahman, & M. N. Qureshi, 2014. Measuring customer experience in banks: scale development and validation. *Journal of Modelling in Management* 9(1), 87-117.
- Gomber, P., R. J. Kauffman, C. Parker, & B. W. Weber, 2018. On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of Management Information Systems* 35(1), 220-265.
- Haddad, C., & L. Hornuf, 2019. The emergence of the global fintech market: Economic and technological determinants. *Small Business Economics* 53(1), 81-105.
- Henard, D. H., & P. A. Dacin, 2010. Reputation for product innovation: Its impact on consumers. *Journal of Product Innovation Management* 27(3), 321-335.
- Hoehle, H., E. Scornavacca, & S. Huff, 2012. Three decades of research on consumer adoption and utilization of electronic banking channels: A literature analysis. *Decision Support Systems* 54(1), 122-132.
- Imerman, M. B., & F. J. Fabozzi, 2020. Cashing in on innovation: a taxonomy of FinTech. *Journal of Asset Management* 21, 167-177.
- Iqbal, K., H. S. Munawar, H. Inam, & S. Qayyum, 2021. Promoting customer loyalty and satisfaction in financial institutions through technology integration: The roles of service quality, awareness, and perceptions. *Sustainability* 13(23), 1-20.
- Karim, R. A., F. A. Sobhani, M. K. Rabiul, N. J. Lepee, M. R. Kabir, & M. A. M. Chowdhury, 2022. Linking fintech payment services and customer loyalty intention in the hospitality industry: the mediating role of customer experience and attitude. *Sustainability* 14(24), 1-16.
- Knight, E., & D. Wojcik, 2020. FinTech, economy and space: Introduction to the special issue. *Environment and Planning A: Economy and Space* 52(8), 1490-1497.
- Komulainen, H., & S. Saraniemi, 2019. Customer centricity in mobile banking: a customer experience perspective. *International Journal of Bank Marketing* 37(5), 1082-1102.
- Kunwar, B. S., & R. N. Thakur, 2019. User acceptance of mobile banking: A Demographic study of Nepal focusing on young customer aged. *Research Journal of Science, Technology and Management* 1(1), 22-40.
- Kunz, W., B. Schmitt, & A. Meyer, 2011. How does perceived firm innovativeness affect the consumer? *Journal of Business Research* 64(8), 816-822.
- Lee, M. C., 2009. Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. *Electronic Commerce Research and Applications* 8(3), 130-141.
- Lim, S. H., D. J. Kim, Y. Hur, & K. Park, 2019. An empirical study of the impacts of perceived security and knowledge on continuous intention to use mobile fintech payment services. *International Journal of Human-Computer Interaction* 35(10), 886-898.
- Mbama, C. I., & P. O. Ezepue, 2018. Digital banking, customer experience and bank financial performance: UK customers' perceptions. *International Journal of Bank Marketing* 36(2), 230-255.

- Mosa, R. A., 2022. The influence of e-customer relationship management on customer experience in e-banking service. *International Journal of Academic Research in Business and Social Sciences* 12(2), 193-215.
- Muthukannan, P., B. Tan, D. Gozman, & L. Johnson, 2020. The emergence of a Fintech Ecosystem: A case study of the Vizag Fintech Valley in India. *Information & Management* 57(8), 103-113.
- Nicoletti, B., 2017. *The Future of FinTech: Integrating Finance and Technology in Financial Services*. Cham, Switzerland: Palgrave Macmillan.
- Parasuraman, A., 2000. Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research* 2(4), 307-320.
- Parasuraman, A., V. A. Zeithaml, & A. Malhotra, 2005. ES-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research* 7(3), 213-233.
- Parise, S., P. J. Guinan, & R. Kafka, 2016. Solving the crisis of immediacy: How digital technology can transform the customer experience. *Business Horizons* 59(4), 411-420.
- Prodanova, J., A. Ciunova-Shuleska, & N. Palamidovska-Sterjadovska, 2019. Enriching m-banking perceived value to achieve reuse intention. *Marketing Intelligence & Planning* 37(6), 617-630.
- Rose, S., M. Clark, P. Samouel, & N. Hair, 2012. Online customer experience in e-retailing: an empirical model of antecedents and outcomes. *Journal of Retailing* 88(2), 308-322.
- Ryu, H. S., & K. S. Ko, 2020. Sustainable development of Fintech: Focused on uncertainty and perceived quality issues. *Sustainability* 12(18), 7669-7686.
- Saif, M. A., N. Hussin, M. M. Husin, A. Alwadain, & A. Chakraborty, 2022. Determinants of the intention to adopt digital-only banks in Malaysia: The extension of environmental concern. *Sustainability* 14(17), 1-32.
- Sayed, G., & N. S. Sayed, 2020. Customer experience with digital banking-a comparative study of private and public sector banks. *Productivity* 61(1), 19-33.
- Shahid, S., J. U. Islam, S. Malik, & U. Hasan, 2022. Examining consumer experience in using m-banking apps: A study of its antecedents and outcomes. *Journal of Retailing and Consumer Services* 65(3), 10-21.
- Shams, R., F. Alpert, & M. Brown, 2015. Consumer perceived brand innovativeness: Conceptualization and operationalization. *European Journal of Marketing* 49(9/10), 1589-1615.
- Shankar, A., & B. Rishi, 2020. Convenience matter in mobile banking adoption intention. *Australasian Marketing Journal* 28(4), 273-285.
- Shiau, W. L., Y. Yuan, X. Pu, S. Ray, & C. C. Chen, 2020. Understanding fintech continuance: perspectives from self-efficacy and ECT-IS theories. *Industrial Management & Data Systems* 120(9), 1659-1689.
- Swaid, S. I., & R. T. Wigand, 2009. Measuring the quality of e-service: Scale development and initial validation. *Journal of Electronic Commerce Research* 10(1), 13-28.
- Tachiciu, L., M. T. Fülöp, A. Marin-Pantelescu, I. Oncioiu, & D. I. Topor, 2020. Non-financial reporting and reputational risk in the Romanian financial sector. *Amfiteatru Economic* 22(55), 668-691.
- Teo, A. C., G. W. H. Tan, K. B. Ooi, T. S. Hew, & K. T. Yew, 2015. The effects of convenience and speed in m-payment. *Industrial Management & Data Systems* 115(2), 311-331.
- Weichert, M., 2017. The future of payments: How FinTech players are accelerating customer-driven innovation in financial services. *Journal of Payments Strategy & Systems* 11(1), 23-33.
- Yang, Q., C. Pang, L. Liu, D. C. Yen, & J. M. Tarn, 2015. Exploring consumer perceived risk and trust for online payments: An empirical study in China's younger generation. *Computers in Human Behavior* 50(1), 9-24.
- Zhou, T., 2013. An empirical examination of continuance intention of mobile payment services. *Decision Support Systems* 54(2), 1085-1091.
- Zouari, G., & M. Abdelhedi, 2021. Customer satisfaction in the digital era: evidence from Islamic banking. *Journal of Innovation and Entrepreneurship* 10(3), 1-18.

Chapter 4

Attitudes towards personal financial planning and management skills of MBA students at Pokhara University, Nepal

- Kabita Bhatta*

Abstract

The study examines the attitudes towards personal financial planning and management skills of MBA students at Pokhara University of Nepal. Personal financial planning and management skills are selected as the dependent variables. The selected independent variables are basic financial knowledge, advance financial knowledge, financial attitude, financial awareness, financial confidence and financial socialization. The study is based on primary data with 138 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the attitudes towards personal financial planning and management skills of MBA students at Pokhara University, Nepal.

The study showed that basic financial knowledge has a positive effect on personal financial planning and management skills implying that more basic financial knowledge leads to better personal financial planning and management skills. Similarly, advance financial knowledge has a positive effect on personal financial planning and management skills. It states that more advance financial knowledge leads to better personal financial planning and management skills. Likewise, financial attitude has a positive effect on personal financial planning and management skills. It implies that positive attitude towards finance leads to better personal financial planning and management skills. Moreover, financial awareness has a positive effect on personal financial planning and management skills. It means that increase in financial awareness leads to better personal financial planning and management skills. In addition, financial confidence has a positive effect on personal financial planning and management skills. It indicates that increase in financial confidence leads to better personal financial planning and management skills. Furthermore, financial socialization has a positive effect on personal financial planning and management skills. It indicates that better financial socialization leads to better personal financial planning and management skills.

Keywords: personal financial planning, management skills, basic financial knowledge, advance financial knowledge, financial attitude, financial awareness

1. Introduction

Personal financial planning refers to the systematic management of funds in order to accomplish individual financial goals. Finance has been a crucial aspect of human society from the inception of civilization. Effective financial planning and management are considered fundamental to achieving success and improving one's confidence and understanding in both personal and national contexts. Through the use of personal financial planning, individuals may evaluate their current financial situation, formulate strategies, and execute them to achieve their financial goals. The increasing use of personal financial planning in the financial sector has generated public interest in the field of financial services. Engaging in personal financial planning is a beneficial approach to anticipate and prepare for forthcoming housing expenditures. Effectively managing personal finances entails the management of one's income, spending, savings, investments, and insurance. Effective personal finance entails devising methods that encompass budgeting, establishing an emergency fund, repaying debts, exercising prudent credit card usage, saving for retirement, and other essential practices (Kapoor et al., 2004).

Van Deventer (2018) examined the systematic and rigorous approach to handling financial resources, which is commonly referred to as personal financial planning. The study seeks to generate a given level of financial prosperity within a specific timeframe, while simultaneously attaining personal satisfaction in economic matters. The study demonstrated that in the face of more intricate and unpredictable financial, economic, and political conditions, engaging in financial planning enables

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individuals to adopt a more conscientious approach to disciplined investment. Swart (2012) evaluated the individual's ability to handle their own finances. The study's findings indicate that a significant number of individuals hold the misconception that concerns about personal finances are exclusive to the affluent, which is far from accurate. It is crucial for individuals to establish a personal financial plan, regardless of their degree of personal wealth. The purpose of financial planning is to equip individuals from all walks of life with the ability to accurately anticipate future events, effectively handle uncertainties, and successfully accomplish financial objectives at every phase of life. Personal money management, commonly referred to as personal financial planning, is a deliberate and systematic approach that results in both financial stability and personal well-being. Individuals have the capacity to manage and regulate their financial circumstances through the use of this strategic planning method. Individuals must initially choose their priorities and establish them in a sequential manner in order to accomplish this task. The fulfillment of financial requirements and objectives is contingent upon the presence of a well-defined plan for allocating funds towards expenditure, savings, and investments. In order to attain financial goals, it is essential to have a thorough financial plan that considers all aspects of one's money, such as budgeting, tax management, obligations, purchases, insurance, investments, retirement, and estate planning (Finke and Huston, 2014).

According to Kapoor et al. (2004), personal financial planning refers to the systematic management of one's money with the aim of achieving individual financial objectives. The rise of personal financial planning has attracted considerable attention in the financial services sector. Personal financial planning is a recently developed and rapidly growing field. Academic recognition, corporate finance, and the establishment of further financial research and specialized institutions are highly necessary and deserving. Personal financial planning is the systematic management of one's finances in order to attain personal economic contentment. An individual's wants and aspirations evolve as they progress through various life phases. Thus, the process of financial planning is characterized by constant change and adaptability (Gitman and Joehnk, 2005). Ergun (2018) conducted a study on financial literacy among university students in eight European nations. The results indicated a moderate level of financial literacy in personal finance. Moreover, the study revealed that individuals with a higher level of expertise in personal finance tend to be male Phd students majoring in business, residing in rental properties, with parents who have a high income. Additionally, those who receive financial advice from friends, have taken financial courses, and obtain financial information from university education also exhibit a greater understanding of personal finance. Lai and Tan (2009) conducted an empirical investigation of personal financial planning in a developing economy. The study found that individuals are effectively allocating their own resources and personal earnings to maintain long-term economic stability, both throughout their active years and in retirement.

Ardiany (2022) investigated the impact of locus of control, financial knowledge, and income on financial management behavior in the context of fishing port ocean battle. The study determined that financial knowledge refers to an individual's comprehension of personal financial issues, which is based on their expertise in various personal financial concepts. According to Widdowson and Hailwood (2007), financial literacy refers to an individual's ability to make educated decisions about managing their money. Financial awareness is a constituent element of financial knowledge. An individual can enhance their knowledge by incorporating diverse sources such as local cultures, customs, personal encounters, and traditions. There is no substantial difference between literacy and financial abilities. Financial attitude is shaped by both financial literacy and financial capability, which are frequently used interchangeably. Proficiency is an essential element of reading in the actual world. Financial literacy has gained global recognition as an essential life skill and a vital element for economic and financial stability and progress. Lai and Tan (2009) examined the perspective of Malaysians towards personal financial planning, which includes several aspects such as money management, insurance planning,

investment planning, retirement planning, and estate planning. The study demonstrated that work status exerts the greatest impact on individuals' attitude towards personal financial planning and the regularity with which they engage in managing different parts of their personal finances.

Danes and Hira (1987) investigated the level of financial literacy among college students, specifically focusing on their awareness of money management topics like as credit cards, insurance, record keeping, personal loans, and general financial management. The survey revealed that while students had a rudimentary comprehension of financial matters, they are deficient in knowledge pertaining to certain subjects. Chen and Volpe (1998) examined the assessment of individual financial literacy among university students. The study demonstrated that a deficient degree of financial literacy will result in ill-informed judgments in the future. In addition, Furtuna (2007) evaluated the level of personal financial literacy among college students. The study determined that a lack of knowledge in financial matters might lead to reduced productivity and impose a strain on the national economy, since personal problems will have a more significant influence when individuals enter the workforce. Financial literacy may have a favorable influence on individuals' financial behavior. Antoni et al. (2020) examined if there is a notable disparity in financial literacy levels among undergraduate students enrolled in the Faculties of Arts (non-Commerce students) and Commerce at a university in South Africa. The results showed that Commerce students had higher levels of financial comprehension in comparison to non-Commerce students. There was no notable disparity in the financial aptitude between the two groups of students.

In Nepalese context, Oli (2018) found that financial attitude and knowledge significantly impact individual financial planning in a good manner. Khanal et al. (2022) determined that financial knowledge does not influence personal financial planning in Nepal. However, the study found that financial attitude and awareness are significant factors. The study also found that increased levels of financial literacy had a beneficial influence on the financial behavior of small borrowers.

The above discussion shows that empirical evidences vary greatly across the studies on the attitudes towards personal financial planning and management skills. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the attitudes towards personal financial planning and management skills of MBA students at Pokhara University of Nepal. Specifically, it examines the relationship of basic financial knowledge, advance financial knowledge, financial attitude, financial awareness, financial confidence and financial socialization with personal financial planning and management skills of MBA students at Pokhara University of Nepal.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 138 respondents through structured questionnaire. The study employed convenience sampling method. The respondents' views were collected on personal financial planning, management skills, basic financial knowledge, advance financial knowledge, financial attitude, financial awareness, financial confidence and financial socialization. The study is based on descriptive and causal comparative research design.

The model

The model estimated in this study assumes that attitudes towards personal financial planning

and management skills depends upon various factors. The dependent variable selected for the study are personal financial planning and management skills. Similarly, the selected independent variables are basic financial knowledge, advance financial knowledge, financial attitude, financial awareness, financial confidence and financial socialization. Therefore, the model takes the following forms.

$$PFP = \beta_0 + \beta_1 BFK + \beta_2 AFK + \beta_3 FAW + \beta_4 FAT + \beta_5 FCON + \beta_6 FSO + e$$

$$MGTsk = \beta_0 + \beta_1 BFK + \beta_2 AFK + \beta_3 FAW + \beta_4 FAT + \beta_5 FCON + \beta_6 FSO + e$$

Where,

PFP = Personal financial planning

MGTsk = Management skills

BFK = Basic financial knowledge

AFK = Advance financial knowledge

FAW = Financial awareness

FAT = Financial attitude

FCO = Financial confidence

FSO = Financial socialization

Personal financial planning was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I feel it is important to save for retirement”, “I have done insurance planning” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.790$).

Management skill was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I often create and review my personal budget on my own”, “I know how to make complex financial decisions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.742$).

Basic financial knowledge was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I have knowledge about financial products”, “I have knowledge of the advantages of the spending plans” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.818$).

Advance financial knowledge was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I am aware of the fundamentals of how the capital market’s function”, “I understand the differences between risk and return” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.922$).

Financial awareness measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I stay informed about changes and trends in financial markets”, “I have knowledge about financial derivative product” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.810$).

Financial attitude measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and

sample items include “I feel sure about my ability to manage my own finances”, “I have a discipline to save regularly” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.792$).

Financial confidence was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I can decide independently what to spend my money on”, “For spending larger amounts, I need to ask my parents or guardians for permission” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.941$).

Financial socialization was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “When I’m making financial decisions, I seek advice from a financial agent”, “I utilize the internet and websites to research financial items” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.762$).

The following section describes the independent variables used in this study along with the hypothesis formulation:

Basic financial knowledge

According to Kim et al. (2019), individuals who possess a foundational understanding of financial concepts are better equipped to manage their personal finances effectively. Basic financial knowledge includes understanding key topics such as budgeting, saving, interest rates, debt management, and the importance of credit scores. When individuals have a solid grasp of these fundamental concepts, they are more likely to engage in sound financial practices (Hong Shan et al., 2023). Basic financial knowledge significantly impacts personal financial planning by providing individuals with the fundamental tools and understanding needed to manage their finances effectively (Mottola, 2014). Based on it, the study develops the following hypothesis:

H₁: There is a positive influence of basic financial knowledge towards personal financial planning and management skills.

Advanced financial knowledge

Advance financial knowledge is a combination of awareness, knowledge, skills, attitudes, and behaviors that individuals should have to make effective financial decisions and ensure the sustainability and growth of their businesses (Refera et al., 2016). Advanced financial knowledge empowers individuals to make well-informed, strategic decisions that enhance their financial stability and growth. It allows for more sophisticated planning and management, ultimately leading to better financial outcomes and the achievement of long-term financial goals (Remund, 2010). According to Renaldo et al. (2020), advanced financial knowledge helps individuals plan more effectively for retirement by understanding the intricacies of retirement accounts, pension plans, and Social Security benefits. This includes making informed decisions about withdrawal strategies and managing investments to ensure a stable and sufficient retirement income. Based on it, the study develops the following hypothesis:

H₂: There is a positive influence of advanced financial knowledge towards personal financial planning.

Financial awareness

Financial awareness is not only crucial for individuals but also for future generations. Parents, educators, and mentors who prioritize financial education pass on valuable knowledge that equips young people to make informed decisions about money from an early age. It is the ability to effectively manage financial resources at a personal level and throughout the lifetime using knowledge and skill (Dewi et al., 2020). Oli (2020) measured the awareness of respondents towards financial products like

saving accounts, shares, debentures, derivative products, money market. When individuals possess a high level of financial awareness, they are more likely to recognize the importance of planning their finances, including setting clear financial goals, budgeting, saving, and investing. This knowledge empowers them to make informed decisions, avoid common financial pitfalls, and optimize their financial resources to meet both short-term and long-term objectives. Based on it, the study develops the following hypothesis:

H₃: There is positive between relationship of financial awareness and personal financial planning.

Financial attitude

Financial attitude encompasses of opinions, confidence, and disposition towards financial matters. Financial attitudes are reflected by the concepts like obsession, effort, power, inadequacy, security, and retention that are used in the study of (Furnham and Grover, 2020). Chaulagain (2015) stated that there is a positive relationship between financial attitude and financial literacy. When individuals have a positive financial attitude, they tend to prioritize financial planning as a key aspect of their life. They are more inclined to set realistic financial goals, create and adhere to budgets, save regularly, and make prudent investment decisions. This proactive and disciplined approach, driven by a positive financial attitude, enhances their ability to manage their finances effectively and achieve long-term financial stability. In essence, the stronger and more positive an individual's financial attitude, the more likely they are to take control of their financial future through careful and strategic planning (Bado et al., 2023). Based on it, the study develops the following hypothesis:

H₄: There is positive relationship between financial attitude and personal financial planning.

Financial socialization

The financial socialization agencies are like parents, education, friends and the media. Financial socialization is considered to have an influence on one's personal financial planning. Financial socialization *means how young individuals or children are made aware of different aspects of finance*. Sundarasan et al. (2014) revealed that the teaching of parents about socialization has significant effect on the financial behavior. Fan and Park (2021) the financial behaviors, attitudes, and knowledge individuals acquire from their social environment—such as family, peers, and media—significantly influence their approach to managing finances. When individuals are exposed to sound financial practices and discussions within their social circles, they are more likely to develop a proactive attitude towards personal financial planning. This exposure helps them understand the importance of setting financial goals, budgeting, saving, and investing wisely. As a result, those who experience strong financial socialization are better equipped to make informed financial decisions and engage in effective financial planning. Ultimately, the quality of financial socialization can play a crucial role in shaping an individual's ability to plan for and manage their financial future successfully. Similarly, Suyanto *et al.* (2021) found that financial socialization has a significant positive influence on financial planning. Based on it, the study develops following hypothesis:

H₅: There is positive relationship between financial socialization and personal financial planning.

Financial confidence

Grable and Chatterjee (2014) examined the role of financial professionals on enhancing financial confidence among widows. The study found a positive association between financial confidence, financial professionals assistance and financial planning. Arellano et al. (2014) revealed that individuals who believe in their ability to manage money effectively are more likely to engage in proactive and strategic financial planning. When people have high financial confidence, they are more inclined to take control of their finances, set financial goals, create budgets, and make informed decisions regarding saving, investing, and spending. This self-assurance reduces the anxiety often

associated with financial decision-making, leading to better management of resources and a greater likelihood of achieving financial stability and success. In essence, as financial confidence increases, so does the likelihood that individuals will actively plan and manage their financial futures, enhancing their overall financial well-being (Ramalho and Forte, 2019). Based on it, the study develops following hypothesis:

H₆: There is positive relationship between financial confidence and personal financial planning.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with mean and standard deviation has been computed and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 138 observations. The dependent variables are PFP (Personal financial planning) and MGTsk (Management skills). The independent variables are BFK (Basic financial knowledge), AFK (Advance financial knowledge), FAW (Financial awareness), FAT (Financial attitude), FCO (Financial confidence) and FSO (Financial socialization).

Variables	PFP	MGTsk	BFK	AFK	FAW	FAT	FCO	FSO
PFP	1							
MGTsk	0.419**	1						
BFK	0.230**	0.244**	1					
AFK	0.277**	0.262**	0.566**	1				
FAW	0.227**	0.247**	0.459**	0.495**	1			
FAT	0.276**	0.333**	0.442**	0.354**	0.478**	1		
FCO	0.263**	0.307**	0.369**	0.368**	0.381**	0.403**	1	
FSO	0.250**	0.359**	0.277**	0.221**	0.227**	0.191**	0.311**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 1 shows that basic financial knowledge is positively related to personal financial planning. It indicates that more basic financial knowledge leads to better personal financial planning. Similarly, advance financial knowledge is positively related to personal financial planning. It states that more advance financial knowledge leads to better personal financial planning. Likewise, financial attitude has a positive relationship with personal financial planning. It implies that positive attitude towards finance leads to better personal financial planning. Moreover, financial awareness has a positive relationship with personal financial planning. It means that increase in financial awareness leads to better personal financial planning. In addition, financial confidence has a positive relationship with personal financial planning. It indicates that increase in financial confidence leads to better personal financial planning. Furthermore, financial socialization is positively related to personal financial planning. It indicates that better financial socialization leads to better personal financial planning.

In addition, basic financial knowledge is positively related to management skills. It indicates that more basic financial knowledge leads to better management skills. Similarly, advance financial knowledge is positively related to management skills. It states that more advance financial knowledge leads to better management skills. Likewise, financial attitude has a positive relationship with management skills. It implies that positive attitude towards finance leads to better management skills. Moreover, financial awareness has a positive relationship with management skills. It means that

increase in financial awareness leads to better management skills. In addition, financial confidence has a positive relationship with management skills. It indicates that increase in financial confidence leads to better management skills. Furthermore, financial socialization is positively related to management skills. It indicates that better financial socialization leads to better management skills.

Regression analysis

Having analyzed the Kendall's Tau correlation coefficients matrix, the regression analysis has been carried out and the results are presented in Table 2. More specifically, it presents the regression results of basic financial knowledge, advance financial knowledge, financial attitude, financial awareness, financial confidence and financial socialization on personal financial planning.

Table 2

Estimated regression results of basic financial knowledge, advance financial knowledge, financial attitude, financial awareness, financial confidence and financial socialization on personal financial planning

The results are based on 138 observation using linear regression model. The model is $PFP = \beta_0 + \beta_1 BFK + \beta_2 AFK + \beta_3 FAW + \beta_4 FAT + \beta_5 FCO + \beta_6 FSO + e$, where the dependent variable is PFP (Personal financial planning). The independent variables are BFK (Basic financial knowledge), AFK (Advance financial knowledge), FAW (Financial awareness), FAT (Financial attitude), FCO (Financial confidence) and FSO (Financial socialization).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		BFK	AFK	FAW	FAT	FCO	FSO			
1	1.445 (3.734) **	0.378 (3.006) **						0.167	0.586	28.381
2	2.337 (9.365) **		0.318 (4.719) **					0.134	0.597	22.266
3	1.548 (4.323) **			0.503 (5.474) **				0.175	0.583	29.970
4	1.557 (4.366) **				0.494 (5.472) **			0.174	0.583	29.938
5	1.717 (6.080) **					0.482 (6.370) **		0.224	0.565	40.575
6	1.983 (7.021) **						0.482 (6.370) **	0.172	0.584	29.370
7	1.983 (7.021) **	0.378 (3.006) **	0.161 (1.918)					0.183	0.580	16.309
8	1.157 (2.868) **	0.244 (1.739)	0.100 (1.139)	0.266 (2.063) *				0.202	0.573	12.554
9	0.959 (2.327) *	0.167 (1.160)	0.104 (1.196)	0.147 (1.038)	0.240 (1.952)			0.218	0.567	10.565
10	0.897 (2.221) *	0.118 (0.830)	0.051 (0.579)	0.095 (0.677)	0.151 (1.206)	0.206 (1.958)		0.252	0.555	10.233
11	0.727 (1.791)	0.076 (0.533)	0.045 (0.524)	0.077 (0.560)	0.146 (1.181)	0.206 (1.958)	0.482 (6.370) **	0.272	0.547	9.541

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Personal financial planning is the dependent variable.

Table 2 shows that the beta coefficients for basic financial knowledge are positive with personal financial planning. It indicates that basic financial knowledge has a positive impact on personal financial planning. This finding is similar to the findings of Kim et al. (2019). Likewise, the beta coefficients for advance financial knowledge are positive with personal financial planning. It indicates that advance financial knowledge has a positive impact on personal financial planning. This finding is consistent with the findings of Remund (2010). Further, the beta coefficients for financial attitude are positive with personal financial planning. It indicates that financial attitude has a positive impact on personal financial planning. This finding is similar to the findings of Furnham and Grover (2020). In addition, the beta coefficients for financial awareness are positive with personal financial planning. It indicates that financial awareness has a positive impact on personal financial planning. This finding is consistent

with the findings of Oli (2020). Moreover, the beta coefficients for financial confidence are positive with personal financial planning. It indicates that financial confidence has a positive impact on personal financial planning. This finding is similar to the findings of Grable and Chatterjee (2014). Likewise, the beta coefficients for financial socialization are positive with personal financial planning. It indicates that financial socialization has a positive impact on personal financial planning. This finding is similar to the findings of Sundarasan et al. (2014).

Table 3 presents the regression results of basic financial knowledge, advance financial knowledge, financial attitude, financial awareness, financial confidence and financial socialization on management skills.

Table 3

Estimated regression results of basic financial knowledge, advance financial knowledge, financial attitude, financial awareness, financial confidence and financial socialization on management skills

The results are based on 138 observation using linear regression model. The model is $MGTsk = \beta_0 + \beta_1 BFK + \beta_2 AFK + \beta_3 FAW + \beta_4 FAT + \beta_5 FCO + \beta_6 FSO + e$, where the dependent variable is MGTsk (Management skills). The independent variables are BFK (Basic financial knowledge), AFK (Advance financial knowledge), FAW (Financial awareness), FAT (Financial attitude), FCO (Financial confidence) and FSO (Financial socialization).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		BFK	AFK	FAW	FAT	FCO	FSO			
1	1.157 (2.914) **	0.572 (5.617) **						0.182	0.601	31.556
2	2.138 (8.312) **		0.340 (4.892) **					0.143	0.615	23.933
3	1.154 (3.186) **			0.575 (6.176) **				0.213	0.590	38.145
4	1.155 (3.206) **				0.566 (6.205) **			0.215	0.589	38.504
5	1.497 (5.141) **					0.509 (6.542) **		0.234	0.582	42.797
6	1.497 (5.141) **						0.668 (8.084) **	0.320	0.548	65.353
7	1.157 (2.942) **	0.416 (3.222) **	0.340 (4.892) **					0.199	0.595	17.983
8	1.157 (2.942) **	0.144 (0.994)	0.087 (0.971)	0.207 (1.448)				0.234	0.582	14.956
9	1.157 (2.942) **	0.144 (0.994)	0.091 (1.042)	0.207 (1.448)	0.294 (2.366) **			0.259	0.572	13.001
10	0.476 (1.165)	0.099 (0.687)	0.042 (0.475)	0.158 (1.119)	0.211 (1.666)	0.113 (1.130)		0.285	0.562	11.941
11	0.116 (0.301)	0.009 (0.066)	0.031 (0.374)	0.122 (0.928)	0.200 (1.709)	0.113 (1.130)	0.455 (4.825) **	0.389	0.520	15.512

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Management skill is the dependent variable.

Table 3 shows that the beta coefficients for basic financial knowledge are positive with management skills. It indicates that basic financial knowledge has a positive impact on management skills. This finding is similar to the findings of Mottola (2014). Likewise, the beta coefficients for advance financial knowledge are positive with management skills. It indicates that advance financial knowledge has a positive impact on management skills. This finding is consistent with the findings of Renaldo et al. (2020). Further, the beta coefficients for financial attitude are positive with management skills. It indicates that financial attitude has a positive impact on management skills. This finding is similar to the findings of Chaulagain (2015). In addition, the beta coefficients for financial awareness are positive with management skills. It indicates that financial awareness has a positive impact on management skills. This finding is consistent with the findings of Dewi et al. (2020). Moreover, the beta coefficients for financial confidence are positive with management skills. It indicates that financial

confidence has a positive impact on management skills. This finding is similar to the findings of Arellano et al. (2014). Likewise, the beta coefficients for financial socialization are positive with management skills. It indicates that financial socialization has a positive impact on management skills. This finding is similar to the findings of Suyanto *et al.* (2021).

4. Summary and conclusion

The process of managing and supervising one's own money management, including earning income, spending, saving, investing, and protecting it, is known as personal financing. With the use of personal financial planning, people can assess their existing financial condition, create plans, and carry them out in order to reach their financial objectives. The rising acceptance of personal financial planning in the financial industry has raised public interest in the financial services industry. Managing personal finances primarily involves handling income, expenses, savings, investments, and insurance. In a similar way, financial management skills are the aptitudes and know-how needed to properly manage your finances. It encompasses abilities like debt management, investing, saving, and budgeting. Gaining these abilities can help you design a long-term financial strategy that will help you achieve your objectives and lead the kind of life you choose.

This study attempts to examine the attitudes towards personal financial planning and management skills of MBA students at Pokhara University of Nepal. The study is based on primary data with 138 observations.

The major conclusion of the study is that basic financial knowledge, advance financial knowledge, financial attitude, financial awareness, financial confidence and financial socialization have positive effect on personal financial planning and management skills of MBA students of Pokhara University. The study also showed that students who possess a strong foundation in basic financial concepts and who have developed more advanced financial understanding are better equipped to make informed financial decisions, manage their finances effectively, and plan for their financial future. Moreover, a positive financial attitude, characterized by a proactive and responsible approach towards money, further enhances their ability to engage in sound financial practices. Financial awareness, which involves staying informed about financial products, markets, and economic trends, also plays a crucial role in empowering students to navigate the complexities of personal finance with greater ease and confidence. Additionally, the study reveals that financial confidence, or the belief in one's ability to manage money effectively, is a key driver in the successful implementation of personal financial plans. Financial socialization, the process through which students learn financial behaviors and attitudes from their social environment, including family, peers, and media, also contributes to their financial competence. Together, these factors create a comprehensive framework that supports and enhances the financial planning and management skills of MBA students, preparing them not only to manage their personal finances but also to excel in their future professional roles where financial acumen is essential. The study also concluded that fostering these aspects of financial literacy is crucial for developing financially responsible and capable individuals who can contribute positively to their personal lives.

References

- Antoni, X. L., A. Dlepu, and N. Notshe, 2020. A comparative study of financial literacy among undergraduate commerce and arts students: A case of a South African University. *International Journal of Economics and Finance* 12(2), 563-580.
- Ardiany, Y., 2022. Pengaruh locus of control, financial knowledge, income terhadap financial management behavior pada pegawai pelabuhan perikanan samudera bungus. *Pareso Jurnal* 4(1), 129-148.
- Arellano, A., N. Cámara, and D. Tuesta, 2014. The effect of self-confidence on financial literacy. *BBVA Research WP* 14(28), 1-25.

- Bado, B., M. Hasan, T. Tahir, and S. Hasbiah, 2023. How do financial literacy, financial management learning, financial attitudes and financial education in families affect personal financial management in Generation Z? *International Journal of Professional Business Review* 8(5), 1-29.
- Chaulagain, R. P., 2015. Financial literacy for increasing sustainable access to finance in Nepal. *NRB Working Paper No. 31*
- Chen, H., and R. P. Volpe, 1998. An analysis of personal financial literacy among college students. *Financial Services Review* 7(2), 107-128.
- Danes, S. M., and T. K. Hira, 1987. Money management knowledge of college students. *Journal of Student Financial Aid* 17(1), 1-9.
- Dewi, V., E. Febrian, N. Effendi, and M. Anwar, 2020. Financial literacy among the millennial generation: Relationships between knowledge, skills, attitude, and behavior. *Australasian Accounting, Business and Finance Journal* 14(4), 24-37.
- Ergun, K., 2018. Financial literacy among university students: A study in eight European countries. *International journal of consumer studies* 42(1), 2-15.
- Fan, L., and N. Park, 2021. Factors mediating the association between financial socialization and well-being of young adults: Testing a conceptual framework. *Journal of Financial Counseling and Planning* 13(1), 41-52.
- Finke, M. S., and S. J. Huston, 2014. Financial literacy and education. *Investor behavior: The Psychology of Financial Planning and Investing* 4(1), 63-82.
- Furnham, A., and S. Grover, 2020. A New Money Behavior Quiz. *Journal of Individual Differences* 41(1), 17-29.
- Furtuna, F., 2007. College students' personal financial literacy: Economic impact and public policy implications. *Undergraduate Economic Review* 4(1), 1-11.
- Gitman, L. J., and M. D. Joehnk, 2005. *Personal Financial Planning* (Thomson, New York).
- Grable, J. E., and S. Chatterjee, 2014. Reducing wealth volatility: The value of financial advice as measured by Zeta. *Journal of Financial Planning* 27(8), 45-51.
- Hong Shan, L., K. S. Cheah, and S. Leong, 2023. Leading Generation Z's financial literacy through financial education: Contemporary bibliometric and content analysis in China. *SAGE Open* 13(3), 21-35.
- Kapoor, J. R., L. R. Dlabay, and R. J. Hughes, 2004. *Personal Finance, Seventh Edition* (The McGraw-Hill Company, New York).
- Khanal, S., B. S. Thapa, and S. R. Nepal, 2022. Determinants of personal financial planning: A survey among business graduates in Nepal. *The Batuk* 8(1), 31-47.
- Kim, K. T., S. G. Anderson, and M. C. Seay, 2019. Financial knowledge and short-term and long-term financial behaviors of millennials in the United States. *Journal of Family and Economic Issues* 40(1), 194-208.
- Lai, M. M., and W. K. Tan, 2009. An empirical analysis of personal financial planning in an emerging economy. *European Journal of Economics, Finance and Administrative Sciences* 16(1), 102-115.
- Mottola, G. R., 2014. The financial capability of young adults—A generational view. *FINRA Foundation Financial Capability Insights* 3(1), 1-12.
- Oli, S. K., 2018. The influence of financial literacy on a personal financial planning: A case of Nepal. *Afro-Asian Journal of Economics and Finance* 1(1), 25-38.
- Ramalho, T. B., and D. Forte, 2019. Financial literacy in Brazil—do knowledge and self-confidence relate with behavior? *RAUSP Management Journal* 54(1), 77-95.
- Refera, M. K., N. K. Dhaliwal, and J. Kaur, 2016. Financial literacy for developing countries in Africa: A review of concept, significance and research opportunities. *Journal of African Studies and development* 8(1), 1-12.
- Remund, D. L., 2010. Financial literacy explicated: The case for a clearer definition in an increasingly complex economy. *Journal of Consumer Affairs* 44(2), 276-295.

- Renaldo, N., S. Sudarno, and H. B. Marice, 2020. The improvement of generation z financial well-being in Pekanbaru. *Jurnal Manajemen Dan Kewirausahaan* 22(2), 142-151.
- Sundarasan, S. D. D., M. S. Rahman, N. Rajangam, and R. Sellappan, 2014. 'Cradle to Grave' financial literacy programs and money management. *International Journal of Economics and Finance* 6(6), 240-246.
- Suyanto, S., D. Setiawan, R. Rahmawati, and J. Winarna, 2021. The impact of financial socialization and financial literacy on financial behaviors: an empirical study in Indonesia. *The Journal of Asian Finance, Economics and Business* 8(7), 169-180.
- Swart, N., 2012. *Personal Financial Management: The Southern African Guide to Personal Financial Planning* (Juta, Claremont).
- Van Deventer, M., 2018. Modelling the factors that explain attitudes towards personal financial planning. *International Journal of Business and Management Studies* 10(2), 183-193.
- Widdowson, D., and K. Hailwood, 2007. Financial literacy and its role in promoting a sound financial system. *Reserve Bank of New Zealand Bulletin* 70(2), 37-47.

Chapter 5

Impact of promotional tools on consumer buying behaviour in retail marketing: A case of Kathmandu Valley

- Kabita Rawal*

Abstract

The study examines the impact of promotional tools on consumer buying behaviour in retail marketing in the context of Kathmandu Valley. Consumer buying behaviour is selected as the dependent variable. The selected independent variables are price discount, coupon discount, buy one get one free, advertising on social media, free samples and bonus. The study is based on primary data with 151 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of promotional tools on consumer buying behavior in retail marketing in the context of Kathmandu Valley.

The study showed that price discount has a positive impact on consumer buying behavior. It indicates that better price discount stimulates the consumer buying behavior. Similarly, coupon discount has a positive impact on consumer buying behavior. It indicates that better coupon discount on the products drives the purchasing intention of the consumer. Likewise, buy one get one free has a positive impact on consumer buying behavior. It indicates that availability of buy one get one free promotion encourages consumers to purchase more products. Furthermore, free sample has a positive impact on consumer buying behavior indicating that free sample promotion activities stimulate the purchasing intention in the consumers. In addition, bonus has a positive impact on consumer buying behavior. It indicates that availability of bonus products and services stimulates the consumers buying behavior. Furthermore, advertising on social media has a positive impact on consumer buying behavior. It indicates that better advertisement on social media encourages the consumers to purchase more products.

Keywords: price discount, coupon discount, buy one get one free, advertising on social media, free sample, bonus

1. Introduction

Sales promotion is one of the widely used methods of promoting the product and services of the company. The promotion of sales is directed toward touching the hearts of consumers. Sales promotion consists of a diverse collection of incentive tools, mostly short term designed to stimulate quicker and/or greater purchase of a particular product by consumers. It offers incentives to consumers to buy a product (Tarigan et al., 2020). Sales promotion efforts are directed at final consumers and designed to motivate, persuade and remind them of the goods and services that are offered. Ibrahim et al. (2018) defined sales promotion as a marketing activity that adds to the basic value proposition behind a product (that is, getting more for less) for a limited time to stimulate consumer purchasing, selling effectiveness, or the effort of the salesforce. Sales promotion is a mediated form of communication from an identifiable source designed to persuade the receiver to take some actions, now or in the future. The increased importance of sales promotion as a strategic tool in consumer markets has generated strong interest among practitioners and academics in understanding the mechanisms, effectiveness, and efficiencies of different sales promotion approach (Chukwuma et al., 2018).

Sales promotion efforts, which include both monetary and non-monetary incentives, are critical for drawing customers' attention to her goods and services, increasing customer patronage, and overcoming competitive obstacles (Kabuoh et al., 2020). Monetary incentives, such as discounts, coupons, cash-back offers, and rebates, provide direct financial benefits that can make a product more appealing to cost-conscious consumers. These incentives often lead to immediate increases in sales

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volume as customers seek to take advantage of limited-time deals. Non-monetary incentives, on the other hand, include value-added promotions like free samples, contests, loyalty programs, and exclusive access to new products. These strategies can enhance the perceived value of a product, build brand loyalty, and encourage repeat purchases. By creating a sense of urgency and excitement, sales promotions can effectively break through the noise in a crowded market, making a brand stand out amidst fierce competition. Additionally, these efforts can help to introduce new products, clear out old inventory, and drive traffic during slower sales periods. In an environment where consumer preferences are constantly shifting, and the competitive landscape is ever-evolving, well-planned and executed sales promotions can provide the necessary edge to attract and retain customers, ensuring sustained market relevance and profitability. Promotional tools have emerged as the most potent instrument for marketers to alter customer perceptions of a brand and stimulate purchase interest. As market competition intensifies, these tools become indispensable in creating a distinct brand identity and driving consumer engagement. Techniques such as discounts, special offers, loyalty programs, contests, and free samples are designed not only to provide immediate value to customers but also to enhance their overall experience with the brand. By utilizing these promotional tools, marketers can effectively communicate the unique selling points of their products, making them more appealing compared to competitors. Moreover, promotional activities can generate excitement and buzz around a brand, encouraging word-of-mouth marketing and increasing its visibility in the marketplace. In an era where consumer choices are abundant and brand loyalty is often fleeting, strategic use of promotional tools can significantly impact a brand's sustainability by fostering long-term customer relationships and loyalty. These techniques can also help to tap into new customer segments and expand market reach, ensuring that the brand remains relevant and competitive. Therefore, embracing a variety of strategic promotional techniques is essential for marketers aiming to maintain their product's market presence and attract a broader customer base (Ali and Muhammad, 2021).

Ashraf *et al.* (2014) investigated the promotional tools and situational factors' impact on consumer buying behaviour and sales promotion. The study found that there was positive attitude of clients to different promotional tools and situational factors on the consumer buying behaviour and sales promotion. Ben Said *et al.* (2019) examined the influence of sales promotion techniques on consumers' purchasing decisions at community pharmacies. The study found that the sales promotion tools had the strongest impact on consumers' purchasing decisions. Malombeke *et al.* (2014) investigated the impact of promotional tools on consumer buying behavior at Matahari department store Manado Town Square. The study revealed that there was a significant positive impact of buy one get one free, price discount, and coupon promotion on consumer buying behavior. Ramadass and Antony (2018) examined the influence of sales promotion techniques on customers buying behavior on durable products during festive season. The study found that sales promotion significantly influences consumers' purchase decisions. Shahzad *et al.* (2020) assessed the impact of promotional tools on consumer buying behaviour in garments industry of Pakistan. The study showed that sales promotion namely discounts, coupons and buy one get one free plays a big role in buying behavior. Adurogbola and Onu (2023) examined sales promotion and consumer purchase behaviour of selected fast moving consumer goods firms in Lagos State, Nigeria. The study concluded that sales promotion through its measures; discount, coupon, free sample, buy-one-get-one free benefits have significant positive effect on consumer purchase behaviour in selected fast-moving consumer goods manufacturing companies in Lagos State, Nigeria.

Sales promotion is a strategic tool that Fast-Moving Consumer Goods (FMCG) product marketers can effectively leverage to boost sales and attract customers. By offering incentives such as discounts, coupons, buy-one-get-one-free offers, contests, or limited-time promotions, marketers can create a sense of urgency and excitement around their products. These promotions can encourage

both new and existing customers to make purchases they might not have otherwise considered, thereby driving immediate sales volume. Etuk *et al.* (2022) revealed that sales promotion can be an effective tool for FMCG product marketers to increase their sales and attract customers. Additionally, sales promotions can help in achieving broader marketing objectives, such as increasing brand awareness, encouraging product trials, and enhancing customer loyalty. For instance, a well-timed promotion can draw attention to a new product launch, facilitating its entry into a competitive market. Seasonal promotions can align with consumer shopping patterns, maximizing the effectiveness of the campaign. In a crowded FMCG market, where products often compete on the basis of price and perceived value, sales promotions can differentiate a brand, making it more attractive to price-sensitive consumers. Moreover, by analyzing the outcomes of these promotions, marketers can gain valuable insights into consumer behavior and preferences, allowing for more targeted and effective future marketing strategies. Overall, sales promotions are a versatile and impactful component of the FMCG marketer's toolkit, capable of driving immediate sales boosts and fostering long-term customer engagement. Ofosu-Boateng (2020) concluded that there was a significant relationship between promotional tools and consumer purchasing behavior. Alcaraz *et al.* (2022) revealed that there is a significant relationship between promotional tools and consumer purchasing behavior. McNeill (2016) established that consumers pay great attention to sales promotion (e.g., free gift, sampling, loyalty programs, discounts, and coupon) when selecting stores. The study also showed that promotional tools such as print advertisements, direct mail, customer loyalty and discount are likely to attract consumers to retail stores, leading to their purchase. Amusat *et al.* (2013) examined the impact of sales promotion on consumer buying behavior. The study revealed that sales promotion activities such as bonus, coupons, free samples, price promotion and premiums affect buying behavior of consumers. Similarly, Jallow and Dastane (2016) revealed that coupon, premium, bonus, free samples and price promotions influences purchase quantity positively and significantly while free samples and price discounts are most influential factors for Malaysian market.

In the context of Nepal, Yadav (2022) showed that price, product, promotion, personnel, place, and store atmosphere have positive impact on consumer buying behavior. The study concluded that marketing mix variables play vital role in order to stimulate the consumer buying behavior. The study also concluded that promotion followed by personnel and price are the most influencing factor that explains consumer buying behavior in Kathmandu Valley. Ballav and Achyut (2020) found that there is a positive relationship of perceived service quality and perceived ease of use with customer satisfaction. The study concluded that higher the perceived service quality and perceived ease of use, higher would be the customer satisfaction. Rana (2016) found that consumers are less concern about the brand image while making a purchase decision. The findings also revealed that people are more influenced by word of mouth and opinion given by the people they know on Facebook and it substantially affects their buying behavior.

The above discussion shows that empirical evidences vary greatly across the studies concerning on the impact of promotional tools on consumer buying behaviour in retail marketing. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of this study is to examine the impact of promotional tools on consumer buying behaviour in retail marketing in the context of Kathmandu Valley. Specifically, it examines the relationship of price discount, coupon discount, buy one get one free, advertising on social media, free sample and bonus with consumer buying behaviour in Kathmandu Valley.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data was gathered from 151 respondents through questionnaire. The study is based on convenience sampling method. The respondents' views were collected on price discount, coupon discount, buy one get one free, advertising on social media, free sample, bonus and buying behaviour. The study is based on descriptive and causal comparative research design.

The model

The model used in this study assumes that the consumer buying behaviour depends upon various factors. The dependent variable selected for the study is consumer buying behaviour. Similarly, the selected independent variables are price discount, coupon discount, buy one get one free, advertising on social media, free sample and bonus. Therefore, the model takes the following form.

$$CBB = \beta_0 + \beta_1 PD + \beta_2 CD + \beta_3 BOGO + \beta_4 AOSM + \beta_5 FS + \beta_6 B + e$$

Where,

CBB= Consumer buying behaviour

PD= Price discount

CD= Coupon discount

BOGO= Buy one get one free

AOSM= Advertising on social media

FS= Free sample

B= Bonus

Price discount was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "I am more likely to purchase a product if it is offered at a discounted price", "I have made impulsive purchases solely because of a price discount" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.887$).

Coupon discount was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "I actively look for coupons before making a purchase", "Coupons make me feel like I'm getting a better deal on a product" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.921$).

Buy one get one free was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "BOGO offers strongly influence my purchasing decisions", "I find BOGO offers to be attractive when shopping" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.916$).

Advertising on social media was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I frequently come across retail promotions on social media platforms”, “Advertisements on social media platforms influence my purchasing decisions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.930$).

Free sample were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I am more likely to try a product if offered a free sample”, “I actively seek out stores or events offering free samples” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.918$).

Bonus was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I perceive bonus offers as added value when considering a purchase”, “Bonuses make me more likely to choose one product over another when shopping” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.907$).

The following section describes the independent variables used in this study along with the hypothesis formulation:

Price discount

Price discounts serve as powerful incentives that can substantially influence consumer decision-making processes. When products are offered at reduced prices, they become more attractive to cost-sensitive shoppers, leading to increased purchase intentions and actual sales. (Chen et al., 2012). Faryabi *et al.* (2012) assessed the effect of price discounts and store image on consumer’s purchase intention in the context of Nokia and HTC phones. The study found that the discounted price has a positive relationship with the consumer’s online purchase decision. Additionally, price discounts can create a sense of urgency through limited-time offers, prompting consumers to act quickly to take advantage of the savings before the deal expires. This urgency can override hesitation or procrastination, further driving sales. Blackwell *et al.* (2001) showed that price discount has a significant influence on purchasing behavior of customer. Price discounts have a significant influence on consumer buying behavior. When consumers are presented with a price reduction on a product, their perceived value of that product increases. This perception of a bargain can lead to heightened interest and urgency in making a purchase. Moreover, price discounts can lead to increased sales volume and customer loyalty. When consumers experience a good deal, they are more likely to return to the store or brand in the future, anticipating similar offers. This repeat patronage can build a stronger customer base over time. Discounts can also lead to word-of-mouth marketing, as satisfied customers are likely to share their positive experiences with friends and family, potentially driving more traffic to the store or brand (Ahmad et al., 2015). Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between price discount and consumer buying behavior.

Coupon discount

Coupon discounts have a significant positive impact on consumer buying behavior by providing direct financial incentives that encourage purchases. Coupons, whether digital or physical, serve as tangible rewards that can make products more affordable and appealing. This discount mechanism taps into consumers’ desire for savings, often triggering a sense of excitement and urgency to redeem the

offer before it expires (Ahmad et al., 2015). According to Barat and Ye (2012), coupons can effectively attract new customers who may have been hesitant to try a product at its regular price. By lowering the cost barrier, coupons facilitate product trials and can lead to brand switching, especially if the consumer is satisfied with the product. For existing customers, coupons serve as a reminder and incentive to repurchase, fostering brand loyalty and repeat business. According to Osman et al. (2011), customers can easily be convinced with the coupons technique since it is very useful tool for trial buying, and it considered as a good way to be used to induce customers brand switching. The coupon is offered by manufacturers or retailers which gives discounts to the coupon holders. Coupon discounts have a significant positive impact on consumer buying behavior by enhancing the perceived value of a product or service. When consumers receive a coupon, they often feel they are getting an exclusive deal, which can increase their excitement and willingness to make a purchase (Malombeke et al., 2014). Based on it, this study develops the following hypothesis:

H₂: Coupon discount has a significant positive impact on consumer buying behavior.

Buy one get one free

Buy One and Get One free (BOGO) is a common form of volume discount promotion, used universally in the marketing industry by retailers, enticing consumers to buy their product through the offer of a free gift. Jayaraman et al. (2013) showed that buy one get one free (BOGO) promotion scheme has significant positive effect on consumer buying behavior in the context of Malaysia. Consumers are often attracted to the idea of receiving an additional product for no extra cost, which creates a strong incentive to buy. This type of promotion can lead to an increase in sales volume, as consumers are likely to purchase more than they initially intended to take advantage of the deal. The BOGO offer can make consumers feel they are getting a substantial benefit, which enhances their overall shopping experience and satisfaction (Kamboj et al., 2018). Moreover, Ahmad et al. (2015) showed a positive association of buy one get one free scheme with consumer buying behavior in Pakistan. Furthermore, Malombeke et al. (2014) assessed the effect of promotional tools on consumer buying behavior at Matahari department store Manado Town Square. The study showed that there was a significant positive association between buy one get one free, price discount, coupon promotion and consumer buying behavior. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between buy one get one free and consumer buying behavior.

Advertising on social media

Social media is the online communication medium on which people can interact with each other, share content and get the information from. Kamboj et al. (2018) found that there is a positive correlation between social media advertising and the purchase intention of advertising products. Advertising on social media has a significant positive impact on consumer buying behavior by leveraging the extensive reach and engagement capabilities of social media platforms. Social media advertising allows brands to target specific demographics with precision, ensuring that promotional content reaches the most relevant audiences. This targeted approach increases the likelihood of capturing consumer interest and driving purchasing decisions (McNeill, 2016). Moreover, Ahmad et al. (2015) showed that the interactive nature of social media enables brands to foster direct communication with consumers, enhancing brand awareness and trust, which can further influence buying behavior. Moreover, social media advertising can amplify word-of-mouth marketing and brand loyalty. Consumers are more likely to share and engage with content on social media, spreading brand messages organically. This peer-to-peer sharing can significantly impact purchasing decisions, as recommendations from friends and family often carry more weight than traditional advertising (Etuk et al., 2022). Based on it, this study

develops the following hypothesis:

H₄: There is a positive relationship between advertising on social media and consumer buying behaviour.

Free sample

A free sample is used to attract new customers for newly launched products in the market. The free samples can either be distributed at public forums or can be delivered to the doorstep of the target market. Ali and Muhammad (2021) assessed the impact of promotional tools on consumer buying behavior in FMCG industry. The study showed that free samples have a positive effect on consumer buying behavior towards FMCG products. Moreover, Ahmad et al. (2015) showed a positive association of free samples with consumer buying behavior in Pakistan. Furthermore, Osman et al. (2011) showed that sales promotions through free samples have positive impact towards buying behavior among university students. Free samples have a significant positive impact on consumer buying behavior by providing a risk-free opportunity for consumers to try a product before committing to a purchase. This exposure can be particularly effective for new or unfamiliar products, as it allows consumers to experience the product's benefits firsthand. When consumers are satisfied with the sample, they are more likely to purchase the full-sized product. Free samples can also reduce the perceived risk associated with trying something new, thereby encouraging trial and potentially leading to repeat purchases (Waani and Tumbuan, 2015). Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between free samples and consumer buying behavior.

Bonus

Bonuses, such as extra product units, loyalty points, or complimentary gifts, have a significant positive impact on consumer buying behavior by enhancing the perceived value of a purchase. When consumers receive a bonus with their purchase, they often feel they are getting more for their money, which can increase their satisfaction and willingness to buy (McNeill, 2016). Suwarno (2020) revealed that price discount, bonus pack, and instore display have positive effect on consumers' purchase intention. Waani and Tumbuan (2015) assessed the influence of price discount, bonus pack, and instore display on impulse buying decision in Hypermart Kairagi Manado. The study showed a positive association of price discount, bonus pack, and in-store display with impulse buying decision. Moreover, bonuses can play a crucial role in building customer loyalty and encouraging repeat business. When consumers consistently receive bonuses, they are more likely to develop a habit of purchasing from the same retailer or brand, anticipating similar rewards in the future. This repeated engagement can solidify the relationship between the consumer and the brand, making it a preferred choice over competitors. Khan et al. (2019) revealed a positive effect of sales promotion through bonus packs on consumer buying behavior in the context of modern trade, Pakistan. Bonuses can create a sense of reward and appreciation, which can strengthen the emotional connection between the consumer and the brand, encouraging repeat purchases. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between bonus and consumer buying behaviour.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with means and standard deviations have been computed, and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau correlation coefficients between dependent and independent variables. The correlation coefficients are based on 151 observations. The dependent variable is CBB (Consumer buying behavior). The independent variables are PD (Price discount), CD (Coupon discount), BOGO (Buy one get one free), AOSM (Advertising on social media), FS (Free sample) and B (Bonus).

Variables	Mean	SD	CBB	PD	CD	BOGO	AOSM	FS	B
CBB	3.483	0.875	1						
PD	3.513	0.867	0.523**	1					
CD	3.082	0.961	0.519**	0.528**	1				
BOGO	3.292	0.978	0.533**	0.526**	0.516**	1			
AOSM	3.459	1.005	0.497**	0.414**	0.375**	0.405**	1		
FS	3.070	1.011	0.534**	0.453**	0.480**	0.466**	0.450**	1	
B	3.362	0.887	0.590**	0.476**	0.478**	0.476**	0.475**	0.524**	1

Notes: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.

Table 1 shows Kendall's Tau correlation coefficients of the selected variables. The study reveals that price discount has a positive relationship with consumer buying behavior. It indicates that better price discount stimulates the consumer buying behavior. Similarly, coupon discount has a positive relationship with consumer buying behavior. It indicates that better coupon discount on the products drives the purchasing intention of the consumer. Likewise, buy one get one free has a positive relationship with consumer buying behavior. It indicates that availability of buy one get one free promotion encourages consumers to purchase more products. Furthermore, free sample have a positive relationship with consumer buying behavior indicating that free sample promotion activities stimulate the purchasing intention in the consumers. In addition, bonus has a positive relationship with consumer buying behavior. It indicates that availability of bonus products and services stimulates the consumers buying behavior. Furthermore, advertising on social media has a positive relationship with consumer buying behavior. It indicates that better advertisement on social media encourages the consumers to purchase more products.

Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 2. More specifically, Table 2 shows the regression results of price discount, coupon discount, buy one get one free, advertising on social media, free sample and bonus on consumer buying behavior in Kathmandu Valley.

Table 2

Estimated regression results of price discount, coupon discount, buy one get one free, advertising on social media, free sample and bonus on consumer buying behavior

The results are based on 151 observations using linear regression model. The model is $CBB = \beta_0 + \beta_1 PD + \beta_2 CD + \beta_3 BOGO + \beta_4 AOSM + \beta_5 FS + \beta_6 B + e$ where the dependent variable is CBB (Consumer buying behavior). The independent variables are PD (Price discount), CD (Coupon discount), BOGO (Buy one get one free), AOSM (Advertising on social media), FS (Free sample) and B (Bonus).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		PD	CD	BOGO	AOSM	FS	B			
1	1.226 (5.315)**	0.643 (10.081)**						0.402	0.677	101.634
2	1.553 (8.887)**		0.627 (11.576)**					0.470	0.637	133.998
3	1.419 (7.897)**			0.627 (11.983)**				0.487	0.626	143.599
4	1.419 (7.897)**				0.550 (9.942)**			0.395	0.681	98.850
5	1.639 (9.942)**					0.601 (11.776)**		0.479	0.632	138.664
6	0.871 (5.037)**						0.777 (15.624)**	0.618	0.540	244.122
7	1.048 (5.014)**	0.314 (4.001)**	0.432 (6.098)**					0.518	0.607	81.753
8	1.048 (5.014)**	0.185 (2.344)*	0.282 (3.791)**	0.325 (4.564)**				0.575	0.570	68.749
9	0.630 (3.206)**	0.130 (1.730)	0.282 (3.791)**	0.245 (3.535)**	0.242 (4.462)**			0.624	0.536	63.174
10	0.627 (3.297)**	0.106 (1.455)	0.194 (2.784)*	0.196 (2.860)**	0.174 (3.098)**	0.207 (3.341)**		0.648	0.519	56.289
11	0.421 (2.392)*	0.421 (2.392)*	0.134 (2.100)*	0.144 (2.288)*	0.101 (1.920)*	0.122 (2.109)*	0.395 (5.726)**	0.712	0.470	62.657

Notes:

- i. Figures in parenthesis are t-values
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Consumer buying behaviour is the dependent variable.

Table 2 shows the regression results of price discount, coupon discount, buy one get one free, advertising on social media, free sample and bonus on consumer buying behavior in Kathmandu Valley. The regression results show that the beta coefficients for price discount are positive with consumer buying behavior. It indicates that price discount has positive impact on consumer buying behavior. This finding is consistent with the findings of Faryabi *et al.* (2012). Similarly, the beta coefficients for coupon discount are positive with consumer buying behavior. It indicates that coupon discount has a positive impact on consumer buying behavior. This finding is similar to the findings of Osman *et al.* (2011). Likewise, the beta coefficients for buy one get one free are positive with consumer buying behavior. It indicates that buy one get one free has a positive impact on consumer buying behavior. This finding is consistent with the findings of Jayaraman *et al.* (2013). Further, the beta coefficients for advertising on social media are positive with consumer buying behavior. It indicates that advertising on social media has a positive impact on consumer buying behavior. This finding is similar to the findings of Ahmad *et al.* (2015). Likewise, the beta coefficients for free sample are positive with consumer buying behavior. It indicates that free sample has a positive impact on consumer buying behavior. This finding is consistent with the findings of Waani and Tumbuan (2015). The beta coefficients for bonus pack are positive with consumer buying behavior. It indicates that bonus pack has a positive impact on consumer buying behavior. This finding is similar to the findings of Khan *et al.* (2019).

4. Summary and conclusion

Instantaneous changes in global socio-economic scenario due to rapid uncertainties and emerging technologies have framed a cutthroat competition between the market players across industries. This colossal change in business structures has altered the consumer demands and driven business focus to search for unique marketing tactics to attract, bring-in, and retain a larger customer pool through various promotional tools. The importance of unique marketing strategies for a business is undeniable as the exclusivity of marketing tools is the core idea to draw customers' attention towards the products. Marketers today are relentlessly trying to decipher new strategies through which changing

customer demands could be catered and seek for innovative ideas to attain customer attention.

This study attempts to examine the impact of promotional tools on consumer buying behaviour in retail marketing in the context of Kathmandu Valley. The study is based on primary data with 151 observations.

The major conclusion of the study is that price discount, coupon discount, buy one get one free, advertising on social media, free sample and bonus have positive effect on consumer buying behaviour in retail marketing in the context of Kathmandu Valley. The study clearly demonstrated that various promotional strategies significantly influence consumer buying behavior in the retail market of Kathmandu Valley. Specifically, price discounts, coupon discounts, and “buy one get one free” offers have been identified as effective tools in attracting customers and boosting sales. Additionally, advertising on social media platforms plays a crucial role in reaching a wider audience and enhancing consumer engagement. Moreover, providing free samples and bonuses not only attracts potential buyers but also fosters brand loyalty and encourages repeat purchases. The study also concluded that retail marketers in Kathmandu Valley should strategically incorporate these promotional tactics to drive consumer interest and increase their market share. By leveraging a combination of price incentives and innovative advertising methods, retailers can create compelling value propositions that resonate with their target audience.

References

- Adurogbola, A. M., and C. Onu, 2023. Sales promotion and consumer purchase behaviour of selected fast moving consumer goods firms in Lagos State, Nigeria, *Global Scientific and Academic Research Journal of Economics, Business and Management* 2(6),81-90.
- Ahmad, S. A., W. Mehmood, S. A. Ahmed, M. Mustafa, M. F. T. Khan, and M. Yasmeen, 2015. Impact of sales promotion on consumer buying behavior in Pakistan. *International Interdisciplinary Journal of Scholarly Research* 1(3), 13-22.
- Alcaraz, P. S. M., M. R. R. Umali, J. K. Jane, and D. B. E. Mendoza, 2022. The promotional tool and consumer purchasing behavior in Calapan City. *American International Journal of Business Management* 5(12), 09-21.
- Ali, A., and K. Muhammad, 2021. Impact of promotional tools on consumer buying behavior: A case of FMCG industry. *Journal of Marketing Strategies* 3(1), 44-67.
- Amusat, W. A., D. A. Adejumo, and F. A. Ajiboye, 2013. Impact of sales promotion on consumer buying behavior: A study of selected manufacturing industry in Ibadan, South Western, Nigeria. *Institute of Interdisciplinary Business Research* 4(11), 122-134.
- Ashraf, M. G., M. Rizwan, A. Iqbal, and M. A. Khan, 2014. The promotional tools and situational factors' impact on consumer buying behaviour and sales promotion. *Journal of Public Administration and Governance* 4(2), 179-201.
- Ballav, N., and G. Achyut, 2020. Customer satisfaction towards online shopping in Kathmandu Valley. *Journal of Management and Social Sciences* 7(2), 135-145.
- Barat, S., and L. Ye, 2012. Effects of coupons on consumer purchase behavior: a meta-analysis. *Journal of Marketing Development and Competitiveness* 6(5), 131-145.
- Ben Said, Y., N. L. Bragazzi, and N. V. Pyatigorskaya, 2019. Influence of sales promotion techniques on consumers' purchasing decisions at community pharmacies. *Pharmacy* 7(4), 150-157.

- Blackwell, R. D., P.W. Miniard, and F. J. Engel, 2001. *Consumer Behaviour* (Harcourt College Publishers, Orlando).
- Chen, H., H. Marmorstein, M. Tsiros, and A. R. Rao, 2012. When more is less: The impact of base value neglect on consumer preferences for bonus packs over price discounts. *Journal of Marketing* 76(4), 64-77.
- Chukwuma, A. I., E. Ezenyilimba, and N. O. Agbara, 2018. Effect of product packaging on the sales volume of small and medium scale bakery firms in South-East Nigeria. *International Journal of Academic Research in Business and Social Sciences* 8(6), 988-1001.
- Etuk, A., J. A. Anyadighibe, E. E. James, and P. M. Egemba, 2022. Trade sales promotion and distributors' performance of fast-moving consumer goods (FMCGS). *International Research Journal of Management, IT and Social Sciences* 9(2), 254-263.
- Faryabi, M., K. Sadeghzadeh, and M. Saed, 2012. The effect of price discounts and store image on consumers' purchase intention in online shopping context case study: Nokia and HTC. *Journal of Business Studies Quarterly* 4(1), 197-205
- Ibrahim, A. N., N. A. Zakaria, M. Kamaruddin, N. N. Mud, and R. A. Rahman, 2018. The effectiveness of promotion strategy influences consumer buying behaviour of Menara optometry. *International Journal of Academic Research in Business and Social Sciences* 8(8), 756-762.
- Jallow, H., and O. Dastane, 2016. Effect of sales promotion schemes on purchase quantity: A study of Malaysian consumers. *Management and Marketing* 14(2), 299-320.
- Jayaraman, K., M. Iranmanesh, M. D. Kaur, and H. Haron, 2013. Consumer reflections on "buy one get one free" (BOGO) promotion scheme-An empirical study in Malaysia. *Research Journal of Applied Sciences, Engineering and Technology* 5(9), 2740-2747.
- Kabuoh, M., O. Smith, A. Okwu, and P. A. Erigbe, 2020. Sales promotion and customer's retention in selected foods and beverages companies in Lagos State Nigeria. *Journal of Critical Reviews* 7(17), 1720-1727.
- Kamboj, S., B. Sarmah, S. Gupta, and Y. Dwivedi, 2018. Examining branding co-creation in brand communities on social media: Applying the paradigm of stimulus organism response. *International Journal of Information Management* 39(7), 169– 185.
- Khan, M., A. Tanveer, and D. S. S. Zubair, 2019. Impact of sales promotion on consumer buying behavior: a case of modern trade, Pakistan. *Governance and Management Review* 4(1), 38-53.
- Malombeke, S., D. P. E. Saerang, and S. S. Pangemanan, 2014. The impact of promotional tools on consumer buying behavior at Matahari department store Manado Town Square. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi* 2(1), 48-56.
- McNeill, L. S. 2016. The influence of culture on retail sales promotion uses in Chinese supermarkets. *Australasian Marketing Journal* 14(2), 34-46.
- Ofori-Boateng, I., 2020. Influence of consumer sales promotion on consumers' purchasing behaviour of the retailing of consumer goods in Tema, Ghana. *International Journal of Trends in Marketing Management* 8(1), 24-36.
- Osman, S., B. C. Y. Fah, and Y. S. Foon, 2011. Simulation of sales promotions towards buying behavior among university students. *International Journal of Marketing Studies* 3(3), 78-88.
- Ramadass, N., and K. P. P. Antony, 2018. The Influence of sales promotion technique on customers buying behavior on durable products during festive season. *International Journal of Research and Analytical Reviews* 5(3), 361-364.
- Rana, A., 2016. Facebook marketing and its influence on consumer buying behaviour in Kathmandu. *Journal of*

Business and Social Sciences Research 1(1), 111-128.

- Shahzad, K., A. Bhatti, T. Islam, and A. Javaid, 2020. Impact of sales promotion on consumer buying behavior: A case of garments industry of Pakistan. *International Journal of Advanced Research in Engineering and Technology* 11(10),104-114.
- Suwarno, B., 2020. An empirical examination of price discount, bonus pack, and instore display on consumers' purchase intention. *International Journal of Science and Business* 4(2), 303-314.
- Tarigan, E. D. S., H. Sabrina, and Y. Syahputri, 2020. The influence of lifestyle and sales promotion on online purchase decisions for homecooked culinary during COVID-19 in Medan City, Indonesia. *International Journal of Research and Review* 7(10), 140-144.
- Waani, R. C., and W. J. A. Tumbuan, 2015. The influence of price discount, bonus pack, and in-store display on impulse buying decision in hypermart kairagi manado. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi* 3(3), 420-428.
- Yadav, A., 2022. Impact of marketing mix variables on consumer buying behavior in Kathmandu Valley. *Perspectives in Nepalese Management* 1(1), 265-276.

Part II:

Human Resource Management

Chapter 6

Factors affecting employee retention in Nepalese commercial banks

- Bibek Pandey*

Abstract

The study examines the factors affecting employee retention in Nepalese commercial banks. Employee retention is selected as the dependent variable. The selected independent variables are training and development, work environment, career development, leadership style, quality of work life and reward system. The study is based on primary data with 133 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of various factors on the employee retention in Nepalese commercial banks.

The results showed that training and development have positive effect on employee retention. It indicates that better training and development programs leads to increase in employee retention. Similarly, work environment has a positive effect on employee retention. It indicates that better working environment leads to increase in employee retention. Moreover, career development has a positive effect on employee retention. It indicates that increase in career development opportunities leads to increase in employee retention. Further, leadership style has a positive effect on employee retention. It indicates that good leadership style leads to increase in employee retention. In addition, quality of work life has a positive effect on employee retention. It indicates that better the quality of work life, higher would be the level of employee retention. Further, reward system has a positive effect on employee retention. It indicates that better the reward system, higher would be the employee retention.

Keywords: employee retention, training and development, work environment, career development, leadership style, quality of work life, reward system

1. Introduction

Employee retention plays a vital role in determining a company's success by influencing both employee and overall organizational performance. Employee retentions refers to the willingness of employees to stay loyal to a company and actively utilize their skill and talents (Khonshenis and Gholipou, 2017). To ensure the long-term employee retention, it is crucial to identify the factors that can contribute to employee satisfaction and implement appropriate strategies to foster loyalty and engagement. Employee retention and turnover are two interconnected aspects that explain staffing stability and employee mobility. Employee retention focused on creating a positive work environment to make the employee remain. Employee retention has the objective of actively engaging employee, acknowledging their contributions, and providing growth (Tanwar and Prasad, 2016). Identifying retention factors such as growth opportunities, job security, recognition, CSR, work-life balance, and compensation can help to shape effective retention strategies. Implementing a retention strategy is crucial to minimize the employee turnover rate, increase employee engagement, and retain highly skilled talents. Effective strategies may involve cultivating employee commitment, introducing career development programs, conducting leadership programs, recognizing employee achievements, and organizing regular family gathering. By understanding the factors influencing retention and implementing effective strategies, the companies can create a supportive work environment and retain valuable employees (Abbas and Arief, 2023).

The most valuable asset available to an organization is its people, thus retaining staff in their jobs is essential for any organization. Indeed, there is a paradigm shift from human resource to human capital which consists of the knowledge, skills and abilities of the people employed in organization which is indicative of their value (Armstrong and Taylor, 2020). Johnson *et al.* (2000) defined employee

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retention as the ability to hold on to those employees that you want to keep, for longer than your competitors. Similarly, Chaminade (2007) stated that retention as a voluntary move by an organization to create an environment which engages employees for long term. Allen (2008) defined employee retention as the ability of an organization to retain its key employees. The study considered employee retention as relating to the efforts by which employers attempt to retain employees in their workforce. The study showed that retention becomes the strategies rather than the outcome. Employee retention is keeping the capable well-performing employees in the organization for a longer period to achieve competitive advantage. Likewise, Das and Baruah (2013) stated employee retention as a process in which the employees are encouraged to linger with the firm for the longer time period or till the project is completed.

According to Samuel and Chipunza (2009), retention of employees is critical for organizations to maintain a source of competitive advantage since the loss of talented employees can be detrimental to the productivity and profitability of businesses. Moreover, Sandhya and Kumar (2011) defined employee retention as a process in which the employees are encouraged to remain with the organization for the maximum period of time or until the completion of the project. Further, Walker (2001) stated that employee retention is a systematic effort to create and foster environment that encourages employees to remain with the organization for the maximum period of time. The study concluded that there is a positive and significant relationship between retention factors and employee retention. Moreover, Leonard (1998) argued that the ability to attract and retain high performing employees is a source of competitive advantage to companies of every size and in every industry. The study found that companies must identify the root causes of employee turnover in order to keep talented employees with them. Similarly, Mita *et al.* (2014) defined employee retention as a technique adopted by businesses to maintain an effective workforce and at the same time meet operational requirements. The study showed that there is a direct relation between employees' decision to stay and work-life balance. According to Alshurideh (2019), retention is more important than recruiting, because the organization is spending more time to train the new employee.

Long term success of an organization depends largely on its ability to effectively manage and utilize its human resources which are considered as the most crucial. Ineffective management of employees leads to a high rate of staff turnover which has a significant economic impact on organizations especially because of the knowledge that is lost with the employees' departure. Samuel and Chipunza (2009) revealed that training and development, sense of belonging to the organization, job security, challenging/interesting work and freedom for innovative thinking have significant impact on the retention amongst employees in both public and private sector organizations. Further, Irshad and Afridi (2007) investigated the elements of HR practices and their effect on employee retention in a given organization. The study found that compensation, rewards, flexible time, trainings and promotion opportunities have positive and significant impact on employee retention. Kyndt *et al.* (2011) found that organizations are providing learning opportunities to the employees for their better retention.

Das and Baruah (2013) concluded that factors like compensation, rewards and recognition, opportunities for promotion and growth, work life balance and job security are some factors among others that affects employee's retention in an organization. The study also revealed that existence of these factors in an organization help to reduce the rate of employee turnover. Daniyal and Khan (2020) examined the role of human resource management practices in retaining employees. The study showed that compensation, working environment, training and development and performance appraisal have positive and significant relationship with employee retention. Similarly, Kaur (2017) found that adopting new innovation technologies and effective training programs, skill recognition, learning and work culture, job flexibility, cost effectiveness, benefits, career development, superior-subordinate

relationship, compensation, organizational commitment, communication and employee motivation have positive and significant impact on employee retention in IT companies.

In the context of Nepal, Chalise (2019) revealed that banks are able to retain their employees through various facilities and services such as better work environment, promotions, salary and benefits, opportunity, the training and development programs and other facilities like supporting environment from its stockholder. Moreover, Baniya (2004) revealed that there is a positive impact of providing training and development opportunities on improved job performance of employees, increased productivity, enhance loyalty towards organizations and decreased turnover of employees. Gautam (2011) showed that there is a direct and positive impact of compensation on employee retention. Similarly, Yukongdi and Shrestha (2020) found that when employees are satisfied with their jobs and are emotionally attached to the organization, they are less likely to think of quitting their jobs while stress at work could contribute to increasing turnover intention. Biswakarma (2016) revealed that promotion and remuneration growth are the foremost factors that have direct high impact on employee turnover intentions, followed by career growth progress. The study concluded that organizations must identify how to reduce employee turnover by addressing organizational career growth of employees and make better decisions about employees' career growth inside their organizations. Similarly, Adhikari (2020) found that employees' turnover intention of Nepalese commercial banks is positively and significantly correlated to compensation, leadership empowerment behavior, organization culture, job stress and organizational justice. The study showed that organizational justice is the most influencing factor followed by organizational culture whereas compensation is the least influencing factor for employees' turnover intention.

The above discussion shows that empirical evidences vary greatly across the studies on the determinants of employee retention in commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to determine the factors affecting employee retention in Nepalese commercial banks. More specifically, it examines the relationship of reward system, work life balance, work environment, training and development, leadership style and career opportunities with employee retention in Nepalese commercial banks.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results and the final sections draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 133 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on reward system, work life balance, work environment, training and development, leadership style, career opportunities and level of retention in Nepalese commercial banks. The study is based on descriptive and causal comparative research designs.

The model

The model used in this study assumes that employee retention depends on reward system, work life balance, work environment, training and development, leadership style and career opportunities. Therefore, the model takes the following form:

$$ER = \beta_0 + \beta_1 TD + \beta_2 WE + \beta_3 CD + \beta_4 LS + \beta_5 QWL + \beta_6 RS + \varepsilon$$

Where,

TD= Training and development

WE= Work environment

CD= Career development

LS= Leadership style

QWL= Quality of work life

RS= Reward system

ER = Employee retention

Training and development were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “The training program has positively impacted my job performance”, “I have received adequate support and resources to implement what I learned during the training” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.908$).

Work environment was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “The overall atmosphere at my workplace is positive and conducive to my productivity and satisfaction”, “My workplace allows me to maintain a healthy work-life balance” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.905$).

Career development was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I feel that my current job provides opportunities for career growth and advancement”, “My organization offers sufficient training and development programs to support my career goals” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.916$).

Leadership style was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “My leader fosters a collaborative environment where teamwork is valued and promoted”, “My leader empowers team members to make decisions and take ownership of their work” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.921$).

Quality of work life was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I am satisfied with the overall balance between professional and personal life”, “I am satisfied with the flexibility your job offers in terms of managing your personal commitments alongside work responsibilities” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.923$).

Reward system was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “The clarity of reward criteria makes it easy for me to understand what is expected”, “I believe that the rewards offered align with my contributions and efforts” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.915$).

Employee retention was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I feel adequately recognized and rewarded for my contributions to the company”, “The company provides a good balance between work and personal life” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.946$).

The following section describes the independent variables used in this study along with hypothesis formulation:

Reward system

Gardner et al. (2004) revealed that compensation is the factor through which employees are willing to show their efforts, more devoted and likely to stay in the organization. Irshad and Afridi (2007) examined the influence of compensation on employee retention. The study revealed that there is a significant relationship between compensation and employee retention. Similarly, Nawab and Bhatti (2011) found that compensation have positive and significant relationship with employee retention. Williams and Dreher (1992) found that compensation as essential means of employee attention as well as their retention. Similarly, Murtiningsih (2020) found that compensation and training and development have positive impact on job satisfaction and employee retention. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between reward system and employee retention.

Training and development

Job-related training improves the ability of employees in problem-solving, making them confident and motivated and committed to their job and thus they are more likely to remain with the organization (Hong et al., 2012). Mehta et al. (2014) suggested that it is better to retain a well-trained employee rather than wasting the training cost and starting the induction process once again. Samuel and Chipunza (2009) found that training and development helps in increasing the level of commitment and loyalty of employees in order to stay for a longer period with the organization hence it decreases turnover and enhances retention. Likewise, Chang (1999) showed that when an organization provides sufficient training and development opportunities, the employees are more satisfied hence, they stay with the organization for a longer period. Similarly, Beynon et al. (2015) showed that training and development have significant impact on employee retention. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between training and development and employee retention.

Career development

Kohlmeyer et al. (2017) found that career growth opportunities have a positive impact on organizational commitment, which reduces turnover intentions. Further, Shujaat et al. (2013) showed that there is a positive relationship between career development and employee job satisfaction in banking sector. The study stated that employees are satisfied with career development programs that are offered at their organizations which help them to retain talent employee. Similarly, Nouri and Parker (2013) found that training effectiveness and promotion have positive and significant relationship with employee retention. Further, Presbitero et al. (2016) found that employee and organization values, human resource management practices like coaching and career development program, compensation, benefits, training and development have significant impact on employee retention. Moreover, Ahmed et al. (2018) showed that there is a positive and significant relationship between career growth opportunities and work engagement. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between career development and employee retention.

Work environment

Dane and Brummel (2014) argued that a good working environment tends to reduce the turnover intention and increase the retention of the employees. Albattat and Som (2013) concluded that the working environment has a negative relationship with the turnover intention. Zhang et al. (2014) assessed the relationship between working environment and turnover in the hospitality industry in China. The results showed that the working environment has a negative association with turnover intention. Kurniawaty (2019) revealed that work environment has a direct negative effect on turnover intention. This means that turnover intention can be reduced through improving the work environment both physically and non-physically in the form of availability of adequate supporting facilities, good physical environment and good management practices. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between working environment and employee retention.

Quality of work life

Sindhuja and Subramanian (2020) examined the effectiveness of the work-life balance of bank employees and its impact on employee retention in banking sectors. The study revealed that the work-life balance has a direct impact on employee's retention. The study also concluded that work-life balance helps to improve the employee's job satisfaction. Similarly, Pasewark and Viator (2006) found that work family balance plays a very important role for retaining employees of an organization. Javed et al. (2014) examined the effect of role conflict, work life balance and job stress on turnover intention. The study revealed that there is a positive and significant relationship of role conflict with turnover intention after analyzing employees of the private sector banks of Pakistan. The study also showed that work life balance has a positive but non-significant relationship with turnover intention. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between work life balance and employee retention.

Leadership style

Jacqueline and Nafula (2021) examined the leadership styles and employee retention in telecommunication industry in Kenya. The study revealed that the existence of a strong positive association between participative style of leadership and retention of employees in the organization. Storey (2004) stated that transformational leadership style which is composed of ideals, influence, inspirational motivation, intellectual stimulation and individualized consideration is one of the most effective leadership styles. The study revealed that components of transformational leadership provide high performance and impact highly on employee satisfaction. Likewise, Iheriohanma et al. (2014) found that democratic leadership style tends to foster responsibility, flexibility, and high morale that will result to improve employees' performance and employee retention. Likewise, Ng'ethe et al. (2012) revealed that supportive leadership style plays a significant role in employee retention. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between leadership style and employee retention.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose,

Kendall's Tau correlation coefficients along with means and standard deviations have been computed, and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau coefficients between dependent and independent variables. The correlation coefficients are based on 133 observations. The dependent variable is ER (Employee retention). The independent variables are TD (Training and development), WE (Work environment), and CD (Career development), LS (Leadership style), QWL (Quality of work life) and RS (Reward system).

Variables	Mean	SD	ER	TD	WE	CD	LS	QWL	RS
ER	3.200	1.171	1						
TD	3.290	1.062	0.359**	1					
WE	3.531	1.017	0.305**	0.323**	1				
CD	3.417	1.012	0.371**	0.291**	0.301**	1			
LS	3.446	1.064	0.376**	0.316**	0.319**	0.344**	1		
QWL	3.363	1.048	0.457**	0.292**	0.467**	0.312**	0.347**	1	
RS	3.382	1.088	0.363**	0.249**	0.391**	0.336**	0.464**	0.395**	1

Notes: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.

Table 1 shows Kendall's Tau correlation coefficients of dependent and independent variables. The study shows that training and development are positively correlated to employee retention. It indicates that better training and development programs leads to increase in employee retention. Similarly, work environment has a positive relationship with employee retention. It indicates that better working environment leads to increase in employee retention. Moreover, career development has a positive relationship with employee retention. It indicates that increase in career development opportunities leads to increase in employee retention. Further, leadership style is positively correlated to employee retention. It indicates that good leadership style leads to increase in employee retention. In addition, quality of work life is positively correlated to employee retention. It indicates that better the quality of work life, higher would be the level of employee retention. Further, reward system is positively correlated to employee retention. It indicates that better the reward system, higher would be the employee retention.

Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 2. More specifically, Table 2 shows the regression results of training and development, work environment, career development, leadership style, quality of work life and reward system on employee retention in Nepalese commercial banks.

Table 2

Estimated regression results of training and development, work environment, career development, leadership style, quality of work life and reward system on employee retention in Nepalese commercial banks are presented in Table 2.

The results are based on 133 observations using linear regression model. The model is $ER = \beta_0 + \beta_1 TD + \beta_2 WE + \beta_3 CD + \beta_4 LS + \beta_5 QWL + \beta_6 RS + \epsilon$ where the dependent variable is ER (Employee retention). The independent variables are TD (Training and development), WE (Work environment), and CD (Career development), LS (Leadership style), QWL (Quality of work life) and RS (Reward system).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		TD	WE	CD	LS	QWL	RS			
1	1.371 (5.573)**	0.527 (6.234)**						0.223	1.032	38.864
2	1.657 (6.728)**		0.462 (5.016)**					0.155	1.076	25.158
3	1.367 (5.546)**			0.554 (6.237)**				0.223	1.032	38.903
4	1.367 (5.546)**				0.518 (6.109)**			0.216	1.037	37.321
5	1.056 (4.715)**					0.66 (8.371)**		0.344	0.948	70.068
6	1.554 (6.493)**						0.475 (5.631)**	0.189	1.054	31.712
7	1.038 (3.843)**	0.410 (4.395)**	0.263 (2.696)*					0.258	1.008	23.996
8	0.684 (2.467)*		0.186 (1.951)	0.343 (3.599)**	0.301 (3.255)**			0.320	0.965	21.695
9	0.684 (2.467)*				0.232 (2.432)*	0.232 (2.432)*	0.475 (5.631)**	0.391	0.194	29.084

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels level respectively.
- Employee retention is dependent variable.

The regression results show that the beta coefficients for training and development are positive with employee retention. It indicates that training and development have positive impact on employee retention. This finding is consistent with the findings of Samuel and Chipunza (2009). Similarly, the beta coefficients for work environment are positive with employee retention. It indicates that work environment has a positive impact on employee retention. This finding is similar to the findings of Albattat and Som (2013). Likewise, the beta coefficients for career development are positive with employee retention. It indicates that career development has a positive impact on employee retention. This finding is consistent with the findings of Presbitero et al. (2016). Further, the beta coefficients for leadership style are positive with employee retention. It indicates that leadership style has a positive impact on employee retention. This finding is similar to the findings of Iheriohanma et al. (2014). In addition, the beta coefficients for quality of work life are positive with employee retention. It indicates that quality of work life has a positive impact on employee retention. This finding is similar to the findings of Sindhuja and Subramanian (2020). Further, the beta coefficients for reward system are positive with employee retention. It indicates that reward system has a positive impact on employee retention. This finding is consistent with the findings of Williams and Dreher (1992).

4. Summary and conclusion

With today's high employment levels, organizations are discovering that the balance of power has shifted from employers to employees due to poor management of turnover impacts. Excessive turnover often indicates underlying issues within a business. Retaining employees is critically important, and understanding how to keep them is essential. In today's competitive environment, awareness and technology significantly intensify competition. Retention has become one of the biggest challenges for Nepalese banking industry, as employees are the primary drivers of profit and are considered the organization's most valuable assets.

This study attempts to examine the factors affecting employee retention in Nepalese commercial banks. The study is based on primary data with 133 respondents.

The major conclusion of the study is that training and development, work environment,

career development, leadership style, quality of work life and reward system have positive effect on employee retention in Nepalese commercial banks. These elements collectively create a supportive and motivating workplace, encouraging employees to remain with their organizations. Investing in comprehensive training programs, fostering a positive and inclusive work environment, providing clear career advancement opportunities, implementing effective leadership practices, enhancing the quality of work life, and offering competitive rewards are essential strategies for retaining talent. By prioritizing these aspects, Nepalese commercial banks can reduce turnover rates and cultivate a stable, committed, and productive workforce. Likewise, the study also concluded that the most dominant factor that determines the employee retention is quality of work life in the context of Nepalese commercial banks.

References

- Abbas, A. E., and N. N. Arief, 2023. Proposed employee retention strategy as the form of employer branding in an educational startup (Case: Vokraf). *International Journal of Current Science Research and Review* 6(7), 4409-4419.
- Adhikari, P. R., 2020. Employees' turnover intention in Nepalese commercial banks. *International Research Journal of Management Science* 5(1), 93-101.
- Ahmed, U., Z. B. Awang, A. S. M. Hoque, B. A. Siddiqui, A. S. Dahri, and H. Muda, 2018. The mediating role of meaningful work between career growth opportunities and work engagement. *International Journal of Academic Research in Business and Social Sciences* 8(11), 1265-1282.
- AlBattat, A. R. S., and A. P. M. Som, 2013. Employee dissatisfaction and turnover crises in the Malaysian hospitality industry. *International Journal of Business and Management* 8(5), 62-68.
- Allen, D. G., 2008. *Retaining Talent: A Guide to Analyzing and Managing Employee Turnover* (SHRM Foundations, Alexandria, VA).
- Alshurideh, D. M., 2019. Do electronic loyalty programs still drive customer choice and repeat purchase behaviour? *International Journal of Electronic Customer Relationship Management* 12(1), 40-57.
- Armstrong, M., and S. Taylor, 2020. *Armstrong's Handbook of Human Resource Management Practice*. (Kogan Page Publishers, London).
- Baniya, L. B., 2004. Human resource development practice in Nepalese business organizations: A case study of manufacturing enterprises in Pokhara. *Journal of Nepalese Business Studies* 1(1), 58-68.
- Beynon, M. J., P. Jones, D. Pickernell, and G. Packham, 2015. Investigating the impact of training influence on employee retention in small and medium enterprises: A regression-type classification and ranking believe simplex analysis on sparse data. *Expert Systems* 32(1), 141-154.
- Biswakarma, G., 2016. Organizational career growth and employees' turnover intentions: Empirical evidence from Nepalese private commercial banks. *International Academic Journal of Organizational Behavior and Human Resource Management* 3(2), 10-26.
- Chalise, D. R., 2019. Employee retention in Nepalese commercial banks. *Management Dynamics* 22(1), 95-106.
- Chaminade, B., 2007. A retention checklist: How do you rate? *African Journal of Business Management* 4(10), 49-54.
- Chang, E., 1999. Career commitment as a complex moderator of organizational commitment and turnover intention. *Human Relations* 52(10), 1257-1278.
- Dane, E., and B. J. Brummel, 2014. Examining workplace mindfulness and its relations to job performance and turnover intention. *Human Relations* 67(1), 105-128.
- Daniyal, M., and M. Khan, 2020. The role of HRM practices in retaining employees: Evidence from the banking

- sector. *Journal of Management Info* 7(4), 232-247.
- Das, B. L., and M. Baruah, 2013. Employee retention: A review of literature. *Journal of Business and Management* 14(2), 8-16.
- Gardner, D. G., L. Van Dyne, and J. L. Pierce, 2004. The effects of pay level on organization-based self-esteem and performance: A field study. *Journal of Occupational and Organizational Psychology* 77(3), 307-322.
- Gautam, D. K., 2011. Changing perspectives of managing human resources in Nepal. *Proceedings of Nepalese Academy of Management* 1(1), 65-78.
- Hong, E. N. C., L. Z. Hao, R. Kumar, C. Ramendran, and V. Kadiresan, 2012. An effectiveness of human resource management practices on employee retention in institute of higher learning: A regression analysis. *International Journal of Business Research and Management* 3(2), 60-79
- Iheriohanma, E. B. J., C. U. Wokoma, and C. N. Nwokorie, 2014. Leadership question and the challenges of community development in Nigeria, *European Scientific Journal* 10 (35), 204–216.
- Irshad, M., and F. Afridi, 2007. Factors affecting employee's retention: Evidence from literature. *Abasyn Journal of Social Sciences* 4(2), 307-339.
- Jacqueline, K. N., and G. Nafula, 2021. Leadership styles and employee retention in telecommunication industry in Kenya: A case study of Safaricom Limited, Nairobi. *International Academic Journal of Innovation, Leadership and Entrepreneurship* 2(2), 206-229.
- Javed, M., M. A. Khan, M. Yasir, S. Aamir, and K. Ahmed, 2014. Effect of role conflict, work life balance and job stress on turnover intention: Evidence from Pakistan. *Journal of Basic and Applied Scientific Research* 4(3), 125-133.
- Johnson, J. T., R. W. Griffeth, and M. Griffin, 2000. Factors discriminating functional and dysfunctional sales force turnover. *Journal of Business and Industrial Marketing* 15(6), 399-415.
- Kaur, R., 2017. Employee retention models and factors affecting employee's retention in IT companies. *International Journal of Business Administration and Management* 7(1), 161-174.
- Khonshenis, M., and A. Gholipou, 2017. Exploring the Relationship between Employer Brand and Employees' Retention. *International Journal of Scientific and Engineering Research* 8(10), 141–151.
- Kohlmeyer, J. M. R. J. Parker, and T. Sincich, 2017. Career-related benefits and turnover intentions in accounting firms: The roles of career growth opportunities, trust in superiors, and organizational commitment. *Advances in Accounting Behavioral Research* 20(3), 1-21.
- Kurniawaty, K., M. Ramly, and R. Ramlawati, 2019. The effect of work environment, stress, and job satisfaction on employee turnover intention. *Management Science Letters* 9(6), 877-886.
- Kyndt, E., F. Dochy, M. Michielsens, and B. Moeyaert, 2009. Employee retention: Organizational and personal perspectives. *Vocations and Learning* 2(3), 195-215.
- Leonard, B., 1998. Welfare to work: Filling a tall Order. *Society of Human Resource Management* 43(6), 78-87.
- Mehta, M., Kurbetti, A. and R. Dhankhar, 2014. Review paper-study on employee retention and commitment. *International Journal of Advance Research in Computer Science and Management Studies* 2(2), 154-164.
- Mita, M., K. Aarti, and D. Ravneeta, 2014. Study on employee retention and commitment. *International Journal of Advance Research in Computer Science and Management Studies* 2(4), 154-164.
- Murtiningsih, R. S., 2020. The impact of compensation, training and development, and organizational culture on job satisfaction and employee retention. *Indonesian Management and Accounting Research* 19(1), 33-50.

- Nawab, S., and K. K. Bhatti, 2011. Influence of employee compensation on organizational commitment and job satisfaction: A case study of educational sector of Pakistan. *International Journal of Business and Social Science* 2(8), 25-32.
- Ng'ethe, J. M., G. S. Namusonge, and M. A. Iravo, 2012. Influence of leadership style on academic staff retention in public universities in Kenya. *International Journal of Business and Social Science* 3(21), 297-302.
- Nouri, H., and R. J. Parker, 2013. Career growth opportunities and employee turnover intentions in public accounting firms. *The British Accounting Review* 45(2), 138-148.
- Pasewark, W. R., and R. E. Viator, 2006. Sources of work-family conflict in the accounting profession. *Behavioral Research in Accounting* 18(1), 147-165.
- Presbitero, A., B. Roxas, and D. Chadee, 2016. Looking beyond HRM practices in enhancing employee retention in BPOs: Focus on employee-organization value fit. *The International Journal of Human Resource Management* 27(6), 635-652.
- Samuel, M. O., and C. Chipunza, 2009. Employee retention and turnover: Using motivational variables as a panacea. *African Journal of Business Management* 3(9), 410-415.
- Sandhya, K., and D. P. Kumar, 2011. Employee retention by motivation. *Indian Journal of Science and Technology* 4(12), 1778-1782.
- Shujaat, S., S. Sana, and F. Aftab, 2013. Impact of career development on employee satisfaction in private banking sector Karachi. *Journal of Management and Social Sciences* 9(2), 01-08.
- Sindhuja, K., and S. Subramanian, 2020. Impact of work-life balance on employee retention: A study on banking sector. *Shanlax International Journal of Management* 7(3), 78-81.
- Storey, J., 2004. *Leadership in Organizations: Current Issues and Key Trends* (Psychology Press, London).
- Tanwar, K., and A. Prasad, 2016. Exploring the relationship between employer branding and employee retention. *Global Business Review* 17(3), 186-206.
- Walker, J. W., 2001. Zero defections? *Human Resource Planning* 24(1), 6-8.
- Williams, M. L., and G. F. Dreher, 1992. Compensation system attributes and applicant pool characteristics. *Academy of Management Journal* 35(3), 571-595.
- Yukongdi, V., and P. Shrestha, 2020. The influence of affective commitment, job satisfaction and job stress on turnover intention: A study of Nepalese bank employees. *Review of Integrative Business and Economics Research* 9(12), 88-98.
- Zhang, L. F., L. M. You, K. Liu, J. Zheng, J. B. Fang, M. M. Lu, and X. Wu, 2014. The association of Chinese hospital work environment with nurse burnout, job satisfaction, and intention to leave. *Nursing Outlook* 62(2), 128-137.

Chapter 7

Impact of motivation on employees' loyalty in Nepalese commercial banks

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Abstract

The study examines the impact of motivation on employees' loyalty in Nepalese commercial banks. Employees' loyalty is selected as the dependent variable. The selected independent variables are working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation and employee motivation. The study is based on primary data with 125 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and impact of motivation on employees' loyalty in the context of Nepalese commercial banks.

The study showed that working environment has a positive effect on employees' loyalty. It indicates healthy working environment leads to increase in employees' loyalty. Similarly, salary and incentives have a positive effect on employees' loyalty. It indicates that increase in salary and incentives leads to increase in employee loyalty. Likewise, job promotion has a positive effect on employee loyalty. It indicates that fair and timely job promotion leads to increase in employee loyalty. In addition, the study shows that career development has a positive effect on employee loyalty. It indicates that increase in career development opportunities leads to increase in employee loyalty. Likewise, work life balance has a positive effect on employees' loyalty. It indicates that proper balance between work life and personal life leads to increase the employee loyalty. Further, recognition and appreciation have a positive effect on employees' loyalty. It indicates that recognition and appreciation program lead to increase employees' loyalty. Furthermore, employee motivation has a positive effect on employees' loyalty. It indicates that higher the employee motivation, higher would be the loyalty of employee towards the organization.

Keywords: working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation, employee motivation

1. Introduction

As the banks strive to adapt to global economic trends and technological advancements, maintaining a committed staff depends on the fundamental relationship between employee motivation and loyalty. The success and failure of any organization largely depend on the motivation and commitment of its employees. When employees are motivated, they are more productive, creative, and willing to go the extra mile to achieve the company's goals. Motivation drives engagement, which leads to higher levels of performance and efficiency (Meyer et al., 2004). Committed employees are more likely to stay with the organization, reducing turnover rates and the associated costs of hiring and training new staff. Their loyalty fosters a stable work environment, which is crucial for maintaining consistent operations and achieving long-term objectives. On the other hand, a lack of motivation and commitment among employees can lead to detrimental outcomes. Disengaged employees often exhibit lower productivity, poor quality of work, and a lack of initiative. This not only hampers the organization's ability to meet its targets but also affects the overall morale of the workforce. High turnover rates due to low commitment can disrupt operations, increase recruitment costs, and lead to a loss of institutional knowledge. Moreover, a demotivated workforce can damage the organization's reputation, making it harder to attract top talent and retain customers (Ezenwakwelu, 2017).

Every organization and business want to be successful and have desire to achieve long lasting progress. Employees are the most important assets for any organization and they are the resources of

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achieving competitive advantage. Achieving employees' loyalty is very challenging job. For achieving employees' loyalty, organization requires effective human resource management system. To attract and retain employees, innovative human resource management practices are required to be implemented. Armanu and Sudjatno (2017) defined motivation as a decisive success in the organization's activities because every member of the organization seeks to achieve the maximum results. Motivation is the desire to do as a willingness to issue a high level of effort for the organization's goals, conditioned by the effort's ability to satisfy an individual needs. Nadeak and Naibaho (2020) stated that the employees who stay in the organization for a longer period of time are considered loyal. The employee who is loyal always focuses on providing superior services to the customers and producing good quality products. A number of factors are associated with the loyalty of the employees. These factors include a promotion, incentives, salaries, benefits, career development opportunities and many others. Basically, these factors create motivation among the employees, which leads to loyalty.

Achieving employee loyalty necessitates an effective human resource management (HRM) system, as it forms the backbone of a company's efforts to attract, develop, and retain its workforce. A robust HRM system begins with a meticulous recruitment and selection process that ensures new hires are not only skilled but also a good cultural fit, which sets the stage for long-term commitment (Omar et al., 2010). Once onboard, providing continuous training and development opportunities allows employees to enhance their skills and advance their careers, fostering a sense of value and belonging. Performance management is another critical aspect, where regular feedback, recognition, and fair evaluations ensure that employees feel appreciated and fairly rewarded for their contributions. Competitive compensation and benefits are essential in retaining top talent, as they directly influence employees' satisfaction and loyalty. Moreover, promoting a healthy work-life balance through flexible working arrangements and adequate leave policies helps employees manage their personal and professional lives, enhancing their overall job satisfaction (Khuong et al., 2020). Employee engagement initiatives, such as open communication channels, involvement in decision-making processes, and a supportive work environment, are vital in building a loyal workforce. These initiatives make employees feel connected and valued, thereby increasing their commitment to the organization (Spakovska et al., 2015). Clear career advancement opportunities further motivate employees to stay and grow within the company, as they see a future for themselves in the organization. Additionally, prioritizing employee well-being through mental and physical health programs demonstrates the company's commitment to its workforce, fostering a deeper sense of loyalty. Lastly, a strong organizational culture that is inclusive and aligned with employees' values significantly enhances their commitment, as they feel a genuine connection to the company's mission and goals. By focusing on these comprehensive aspects, an HRM system can effectively cultivate a loyal, motivated, and high-performing workforce that is essential for the organization's success (Frempong et al., 2018).

Manthena and Ravi (2024) showed that motivation plays significant role in employee retention and it have high impact on employee to retain in organization and increase its performance. Moreover, the study showed that there is a positive relation between motivation and employee retention. Likewise, Musa et al. (2021) stated that the high level of motivation possessed by employees is one of the keys in improving employee performance. Mehta et al. (2010) stated that the underlying factors of loyalty are career development, motivation, bonding, job security, leadership, and commitment. Khuong et al. (2020) showed that employee loyalty was also directly affected by career development, working environment and employee motivation. Abusharbeh and Nazzal (2018) concluded that there is a high level of association between motivation and employee's performance. The result also showed that there is a strong positive impact of moral incentives on employee's performance. Nadeak and Naibaho (2020) examined the role of education and training, internal communication, organizational culture and employee motivation on employee loyalty. The results revealed that there exists a positive relationship

between education and training, internal communication, organizational culture, motivation and loyalty. According to Spakovska et al. (2015), leadership opportunities, recognition and employee appraisal, meeting employee expectations and socialization are the key factors that motivate employees. Organizational trust and teamwork have a positive effect on employee loyalty while transformational leadership has an insignificant effect on employee loyalty. Further, transformational leadership and teamwork have a positive effect on organizational trust. Lastly, organizational trust significantly mediates the effect of transformational leadership and teamwork on employee loyalty. Manager's support will increase the sense of loyalty among the employees, fostering a trusting environment that encourages employees to keep working hard even under difficult conditions (Bano et al., 2023). Managerial standards, motivation, commitment, employee evaluations, positive work environment, technology, lack of incentives, comfort level and poor management are factors that affect employees' performance (Ibrahim and Brobbey, 2015).

In the context of Nepal, Limbu (2023) examined the factors influencing job satisfaction and its impact on job loyalty in the context of Nepalese commercial banks. The results showed that reward and recognition have positive impact on job loyalty. It implies that increase in reward and recognition leads to increase in job loyalty. The result also showed that workplace environment has a positive impact on job loyalty. It implies that better the workplace environment, higher would be the job loyalty. Gautam (2020) stated that compensation, benefits, work-life balance, performance recognition and empowerment and career opportunity were the major factors as the components of comprehensive reward system. The study showed that these factors had significant positive relationship with employee motivation. Thapa (2016) showed that better the workplace environment, higher would be the employees' performance. The results also revealed that better the reward system, higher would be the employees' performance. The study also indicates that empowerment and salary are positively related to employees' performance which implies that higher the empowerment and salary, higher would be the employees' performance.

The above discussion shows that empirical evidences vary greatly across the studies concerning on the impact of motivation on employees' loyalty in commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of motivation on employees' loyalty in the context of Nepalese commercial banks. Specifically, it examines the relationship of working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation and employee motivation with employees' loyalty in Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data was gathered from 125 respondents through structured questionnaire. The respondents' views were collected on working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation and level of motivation in the context of Nepalese commercial banks. The study is based on descriptive and causal comparative research design.

The model

The model used in this study assumes that the employees' loyalty of Nepalese commercial banks depends upon various factors. The dependent variable selected for the study is employees' loyalty. Similarly, the selected independent variables are working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation and employee motivation. Therefore, the model take the following forms.

$$EL = \beta_0 + \beta_1 WE + \beta_2 SI + \beta_3 JP + \beta_4 CD + \beta_5 WLB + \beta_6 RA + \beta_7 EM + e$$

Where,

EL = Employees' loyalty

WE = Working environment

SI = Salary and incentives

JP = Job promotion

CD = Career development

WLB = Work life balance

RA = Recognition and appreciation

EM = Employee motivation

Working environment was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "The working environment at the bank significantly influences my loyalty and commitment to the organization", "I feel comfortable discussing ideas and concerns with my colleagues and supervisors" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.933$).

Salary and incentive were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "I feel that my salary is competitive compared to similar positions in the industry", "My company provides salary in regular interval" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.955$).

Job promotion was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Organization provides adequate opportunities for personal as well as professional growth", "There is absence of discrimination and favoritism for promotion process" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.952$).

Career development was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "I feel that my career goals align with the growth opportunities available within the bank", "Career development opportunities strongly influence my loyalty and commitment to the organization" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.960$).

Work life balance measured using a 5-point Likert scale where the respondents were asked

to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I am happy with current work life balance at the bank”, “The bank’s policies and practices support healthy work-life balance for employees” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.808$).

Recognition and appreciation were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I receive timely and appropriate recognition and appreciation for my achievements and contributions at work”, “Reward, recognition and appreciation motivates me to work hard and enhance my loyalty to bank” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.954$).

Employee motivation was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I receive constructive feedback and support from my supervisors to stay motivated”, “I believe that my contributions to the bank are valued, leading to increased motivation” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.974$).

Employees’ loyalty was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I am committed to staying with the bank for the long term”, “I would recommend the bank as a great place to work to others” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.916$).

The following section describes the independent variables used in this study along with the hypothesis formulation:

Working environment

Kullab and Kassim (2017) revealed that the factors of workplace environment such as performance feedback, manager support and mentoring, co-workers’ teamwork, and environmental factors have significant impact on the employee satisfaction towards the job and affect the loyalty to organization. Sukawati and Suwandana (2021) examined the effect of physical work environment, workload, and compensation on employee loyalty at Visesa Ubud Resort. The study revealed that the physical work environment positively affects the employee loyalty. Aljayi et al. (2016) stated that the physical work environment has a positive and significant effect on employee loyalty in the context of Japanese Multinational Company in Morocco. The better the physical work environment, higher would be the employee loyalty and vice versa. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship of working environment with employees’ loyalty.

Salary and incentives

Nnubia (2020) determined the impact of monetary incentives on employee performance on a manufacturing firm in Anambra state. The study revealed a positive association between salary, wage, commission and job performance. Furthermore, Idowu et al. (2019) determined the impact of monetary and non-monetary incentives on the loyalty of employees. The study concluded that sufficient incentive packages are required to maintain the loyalty of employees and increase job performance. Saleem (2011) stated that financial incentives and rewards positively affect employees’ commitment or loyalty. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship of salary and incentives with employees' loyalty.

Job promotion

Job promotion can serve as motivation because it reflects an employee's hard work to gain recognition for their loyalty, allowing them to hold higher positions. Widiani and Wayan (2020) indicated that there is positive relationship between employee loyalty towards the organization and job promotion. Prashanth and Veena (2022) indicated that loyalty of employee is directly proportional to royalty of an organization. Positive stimulus has a profoundable impact on the individuals and in turn on their output. Idrus and Idrus (2023) concluded that promoted individuals can take a more proactive role in organizational decision making, shape strategic direction, and collaborate with leaders to achieve shared goals. Promotion also carries consequences related to obligations, rights, status and income. With increased responsibility, promoted individuals are expected to be able to carry out their duties and responsibilities more effectively. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship of job promotion with employees' loyalty.

Career development

Susita et al. (2020) determined the effect of career development and work environment on employee loyalty. The result showed that career development has a significant positive effect on employee loyalty, where the better the concept of career development owned by the company, the higher the employee loyalty. Fadhila and Sulistiyani (2021) stated that a clear career planning will make employees feel that the company already understands their career needs. Every employee will definitely consider on how much the company supports themselves to develop and develop their careers. Career development make employees feel valued so they become loyal to the company. Aljehani and Javed (2021) determined that employees are more loyal when they continue to grow and develop within the organization. Majid et al. (2017) indicated that lack of career development and opportunities for promotion were key aspects associated with employee turnover, indicating poor employee loyalty. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship of career development with employees' loyalty.

Work life balance

Saleem (2011) showed that work life balance has a positive and significant effect on employees' loyalty. Kabir and Rahman (2019) examined the effects of work life balance on employee loyalty in private commercial banks of Bangladesh. The study revealed that the healthy work life balance has a positive influence on employees' loyalty. Murphy and Doherty (2011) assessed the experience of work life balance for Irish senior managers. The study showed a positive relationship between work life balance and employees' loyalty. The study revealed that balance of work and personal life leads to increase in employee loyalty towards their organization. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship of work life balance with employees' loyalty.

Recognition and appreciation

Tessema et al. (2013) indicated that recognition is an important tool for managers, business owners and HR professionals in promoting employee loyalty, motivation and organizational success. Employee recognition is associated with higher levels of employee loyalty, engagement, motivation and satisfaction. Recognition in the form of financial rewards, positive feedback and social recognition is linked with increased levels of loyalty and job performance. Abdullah et al. (2016) determined

the positive relationship between recognition and appreciation and employees' loyalty. Furthermore, Nyakaro (2016) stated that a well-designed recognition program aims to improve organizational culture and individual workers behavior Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship of recognition and appreciation with employees' loyalty.

Employee motivation

Olla et al. (2020) determined that motivation consisting of prestige, recognition, work itself, responsibility, the progress and development of individual potential has a positive influence on employee performance and loyalty. Sari (2018) indicated that employees' motivation and satisfaction will boost loyalty towards the company. Rukmana et al. (2022) determined the positive relationship between employee motivation and loyalty. Ibrahim and Yesiltas (2021) also stated that there is a positive relationship between employee motivation and loyalty. Based on it, this study develops the following hypothesis:

H₇: There is a positive relationship of employee motivation with employees' loyalty.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with means and standard deviations have been computed, and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau coefficients between dependent and independent variables. The correlation coefficients are based on 125 observations. The dependent variable is EL (Employee loyalty). The independent variables are WE (Working environment), SI (Salary and incentives), JP (Job promotion), CD (Career development), WLB (Work life balance), RandA (Recognition and appreciation) and EM (Employee motivation).

Variables	Mean	S.D.	EL	WE	SI	JP	CD	WLB	RA	EM
EL	4.344	0.818	1.000							
WE	4.296	0.904	0.857**	1.000						
SI	4.246	0.933	0.882**	0.845**	1.000					
JP	4.304	0.890	0.830**	0.771**	0.801**	1.000				
CD	3.755	0.802	0.354**	0.364**	0.371**	0.409**	1.000			
WLB	4.301	0.872	0.760**	0.765**	0.764**	0.778**	0.394**	1.000		
RA	4.434	0.835	0.589**	0.573**	0.552**	0.505**	0.197**	0.609**	1.000	
EM	3.952	0.874	0.353**	0.393**	0.350**	0.345**	0.298**	0.405**	0.562**	1.000

Notes: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.

Table 1 shows Kendall's Tau correlation coefficients of dependent and independent variables. The study shows that working environment is positively correlated to employees' loyalty. It indicates healthy working environment leads to increase in employees' loyalty. Similarly, salary and incentives have a positive relationship with employees' loyalty. It indicates that increase in salary and incentives leads to increase in employee loyalty. Likewise, job promotion has a positive relationship with employee loyalty. It indicates that fair and timely job promotion leads to increase in employee loyalty. In addition,

the study shows that career development is positively correlated to employee loyalty. It indicates that increase in career development opportunities leads to increase in employee loyalty. Likewise, work life balance is positively correlated to employees' loyalty. It indicates that proper balance between work life and personal life leads to increase the employee loyalty. Further, recognition and appreciation are positively correlated to employees' loyalty. It indicates that recognition and appreciation program leads to increase employees' loyalty. Furthermore, employee motivation is positively correlated to employees' loyalty. It indicates that higher the employee motivation, higher would be the loyalty of employee towards the organization.

Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 2. More specifically, Table 2 shows the regression results of working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation and employee motivation on employees' loyalty in Nepalese commercial banks.

Table 2

Estimated regression results of working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation and employee motivation on employees' loyalty in Nepalese commercial banks

The results are based on 125 observations using linear regression model. The model is $EL = \beta_0 + \beta_1 WE + \beta_2 SI + \beta_3 JP + \beta_4 CD + \beta_5 WLB + \beta_6 RA + \beta_7 EM + e$ where the dependent variable is EL (Employee loyalty). The independent variables are WE (Working environment), SI (Salary and incentives), JP (Job promotion), CD (Career development), WLB (Work life balance), RA (Recognition and appreciation) and EM (Employee motivation).

Model	Intercept	Regression coefficients of							Adj. R ²	SEE	F-value
		WE	SI	JP	CD	WLB	RA	EM			
1	8.481 (3.616)**	0.519 (4.893)**							0.156	4.834	23.938
2	8.326 (4.061)**		0.532 (5.698)**						0.202	4.700	32.463
3	9.491 (4.753)**			0.042 (0.140)					0.177	4.774	27.714
4	9.823 (4.556)**				0.462 (4.705)**				0.146	4.865	22.137
5	10.180 (4.861)**					0.510 (4.677)**			0.144	4.869	21.871
6	7.908 (3.721)**						0.551 (5.689)**		0.202	4.702	32.362
7	7.908 (3.721)**							0.748 (8.187)**	0.347	4.251	67.034
8	9.179 (3.997)**	0.241 (0.829)	0.737 (2.794)**						0.200	4.706	16.534
9	9.293 (3.984)**	0.283 (0.885)	0.680 (2.142)*	0.042 (0.140)					0.194	4.723	10.976
10	9.103 (3.874)**	0.399 (1.123)	0.702 (2.198)*	0.042 (0.140)	0.155 (0.757)				0.192	4.732	8.346
11	7.400 (2.966)**	0.363 (1.032)	0.661 (2.084)*	0.004 (0.013)	0.155 (0.757)	0.222 (1.646)			0.208	4.682	7.531
12	6.918 (4.769)**	0.461 (1.504)	0.616 (1.950)	0.130 (0.418)	0.069 (0.311)	0.222 (1.646)	0.374 (1.566)		0.218	4.654	6.761
13	0.775 (0.308)	0.461 (1.504)	0.241 (0.850)	0.179 (0.660)	0.069 (0.311)	0.069 (0.311)	0.167 (0.791)	0.731 (6.121)**	0.403	4.067	12.93

Notes:

- Figures in parenthesis are t-values
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Employees' loyalty is the dependent variable.

Table 2 shows the regression result of working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation and employee motivation on employees' loyalty in Nepalese commercial banks. The regression results show that the beta coefficients for working environment are positive with employee loyalty. It indicates that working environment has positive impact on employee loyalty. This finding is consistent with the findings of Susita et al. (2020). Similarly, the beta coefficients for salary and incentives are positive with employee loyalty. It indicates that salary and incentives have a positive impact on employee loyalty. This finding is similar to the findings of Saleem (2011). Likewise, the beta coefficients for job promotion are positive with employee loyalty. It indicates that job promotion has a positive impact on employee loyalty. This finding is consistent with the findings of Idrus and Idrus (2023). Further, the beta coefficients for career development are positive with employee loyalty. It indicates that career development has a positive impact on employee loyalty. This finding is similar to the findings of Aljehani and Javed (2021). Likewise, the beta coefficients for work life balance are positive with employee loyalty. It indicates that work life balance has a positive impact on employee loyalty. This finding is consistent with the findings of Murphy and Doherty (2011). The beta coefficients for recognition and appreciation are positive with employee loyalty. It indicates that recognition and appreciation has a positive impact on employee loyalty. This finding is similar to the findings of Tessema et al. (2013). In addition, the beta coefficients for employee motivation are positive with employee loyalty. It indicates that employee motivation has a positive impact on employee loyalty. This finding is consistent with the findings of Sari (2018).

4. Summary and conclusion

The capable and knowledgeable workforce in an organization is very crucial in overall performance of an organization. Without the involvement of its employees, no organization can achieve its short, medium, and long-term corporate goals and objectives. Motivation is considered as the basic driving force within an individual to achieve a certain goal. It is very important for the organization to measure the motivation of the employee. It is also necessary for the banking sectors to discuss and find out the factors which are important to create motivation among the employees. The employees who are motivated are more effective and productive for the organization. Fostering an environment that promotes motivation and commitment is essential. This involves creating a supportive and inclusive work culture, offering opportunities for growth and development, recognizing and rewarding contributions, and ensuring fair and transparent management practices. When employees feel valued and see a clear path for their professional advancement, they are more likely to be engaged and committed to their work, driving the organization towards success.

This study attempts to examine the impact of motivation on employees' loyalty in Nepalese commercial banks. The study is based on primary data with 125 observations.

The major conclusion of the study is that working environment, salary and incentives, job promotion, career development, work life balance, recognition and appreciation and employee motivation have positive impact on employees' loyalty in Nepalese commercial banks. The study also concluded that healthy and positive work environment, monetary as well as non-monetary rewards, opportunities for career advancement and growth, healthy work life balance, recognition and appreciation program and employee motivation are crucial for the enhancement of the employees' loyalty.

References

- Abdullah, N., O. A. Shonubi, R. Hashim and N. Hamid, 2016. Recognition and appreciation and its psychological effect on job satisfaction and performance in a Malaysia it company: systematic review. *IOSR Journal of Humanities and Social Science* 21(9), 47-55.

- Abusharbeh, M. T., and H. H. Nazzal, 2018. The impact of motivations on employees' performance: Case Study from Palestinian Commercial Banks. *International Business Research* 11(4), 142-153.
- Aljayi, Y., A. Fjer, M. Guennioui and A. Tamek, 2016. Multinational companies' human resource management practices and their work environment impact on employees' loyalty: Case of Japanese Multinational Company in Morocco. *Journal School of Business Administration* 5(8), 204 – 211.
- Aljehani, R., and U. Javed, 2021. Relationship between career development and employee loyalty. *PalArch's Journal of Archaeology of Egypt/Egyptology* 18(14), 123-134.
- Armanu, A., and S. Sudjatno, 2017. The effect of direct and indirect compensation to motivation and loyalty of the employee. *Jurnal Aplikasi Manajemen* 15(1), 25-32.
- Bano, S., A. Athar and S. Mughal, 2023. The effect of leadership and teamwork on employee loyalty and organizational trust as a mediating variable. *Global Management Journal for Academic and Corporate Studies* 13(1), 54-77.
- Ezenwakwelu, C. A., 2017. Determinants of employee motivation for organisational commitment. *IOSR Journal of Business and Management* 19(7), 1-9.
- Fadhila, N., and E. Sulistiyani, 2021. The influence of motivation, working environment and career development toward employees' loyalty. *AFEBI Management and Business Review* 6(2), 140-148.
- Frempong, L. N., W. Agbenyo, and P. A. Darko, 2018. The impact of job satisfaction on employees' loyalty and commitment: a comparative study among some selected sectors in Ghana. *European Journal of Business and Management* 10(12), 95-105.
- Gautam, P. K., 2020. Comprehensive reward system, employee motivation and turnover intention: evidence from Nepali banking industry. *Quest Journal of Management and Social Sciences* 1(2), 181-191
- Ibrahim, M. S., and M. Yesiltas, 2021. Impact of internal marketing on loyalty, promotion and customer relationship considering the mediating roles of training, motivation and reward. *Revista Argentina de Clínica Psicológica* 30(2), 200-211.
- Ibrahim, M., and V. A. Brobbey, 2015. Impact of motivation on employee performance. *International Journal of Economics, Commerce and Management* 3(11), 1218-1237.
- Idowu, H., K. Soyibo and E. Adeoye, 2019. Incentives as correlates of employees' loyalty towards management in organization. *African Journal of Business Management* 13(12), 407-414.
- Idrus, M. I., and M. I. Idrus, 2023. The effect of mutation, promotion, and remuneration systems on job satisfaction and loyalty of Makassar city government employees. *International Journal of Social Science Research and Review* 6(12), 338-345.
- Kabir, M. A. A., and M. Rahman, 2019. Effects of work life balance on employee loyalty in private commercial banks of Bangladesh. *Journal of Economics and Sustainable Development* 10(14), 1-14.
- Khuong, M., T. Mai, and N. Phuong, 2020. The impacts of human resource management practices on employees' motivation and loyalty. *Management Science Letters* 10(11), 2673-2682.
- Kullab, M. A., and R. N. M. Kassim, 2017. Determinants of working environment, employee loyalty and employee turnover of ICT-SME industry. *World Journal of Research and Review* 5(5), 6-8.
- Limbu, P., 2023. Factors influencing job satisfaction and its impact on job loyalty of Nepalese commercial banks. *Perspectives in Nepalese Management* 1(1), 391-540.
- Majid, M. A. A., A. Samsudin, M. H. I. Noorkhizan, S. N. A. M. Noor and N. S. H. A. Zuffri, 2017. Career development, job security and employee loyalty at a luxury resort in Terengganu, Malaysia. *International Journal of Academic Research in Business and Social Sciences* 7(10), 667-674.
- Manthena, S. R. L., and J. Ravi, 2024. A study on employee retention and its impact on organizational performance: motivation plays a moderator role with reference to private sector banks in Hyderabad. *Educational Administration: Theory and Practice* 30(4), 3361-3369.
- Mehta, S., T. Singh, S. Bhakar and B. Sinha, 2010. Employee loyalty towards organization—a study of academicians. *International Journal of Business Management and Economic Research* 1(1), 98-108.
- Meyer, J. P., T. E. Becker, and C. Vandenberghe, 2004. Employee commitment and motivation: a conceptual

- analysis and integrative model. *Journal of Applied Psychology* 89(6), 991-1007.
- Murphy, F., and L. Doherty, 2011. The experience of work life balance for Irish senior managers. *Equality, Diversity and Inclusion: An International Journal* 30(4), 252-277.
- Musa, F. N. H., A. Tumbel and M. Wullur, 2021. Discipline analysis of work, motivation and loyalty towards employee performance (Case Study at Gorontalo State University). *Aksara: Jurnal Ilmu Pendidikan Nonformal* 7(2), 449-462.
- Nadeak, B., and L. Naibaho, 2020. Motivation and HRM factors relation to the employee loyalty. *Polish Journal of Management Studies* 22(2), 261-276.
- Nnubia, A. L., 2020. Monetary incentives and employee performance of manufacturing firms in Anambra State. *International Journal of Innovative Finance and Economics Research* 8(1), 10-22.
- Nyakaro, M. R., 2016. Effect of recognition on work commitment by non-teaching staff in public university in Kenya. *Online Journal of Social Sciences Research* 5(1), 47-56.
- Olla, T. S. O. O., F. Gana and A. S. Kerihi, 2020, November. The effect of employee motivation and loyalty on employee performance (a study in Ramayana Lestari Sentosa, Tbk Kupang Branch). In *International Seminar on Sustainable Development in Country Border Areas* 2(1), 759-772.
- Omar, M. W., K. Jusoff, and H. Hussin, 2010. Employee motivation and its impact on employee loyalty. *World Applied Sciences Journal* 8(7), 871-873.
- Prashanth, K. C., and M. Veena, 2022. Effects of recognition and reward on employee loyalty. *EPRA International Journal of Research and Development* 7(6), 354-357.
- Rukmana, D. A., D. E. Prasetyo, H. N. Ginting, R. M. H. Payu, S. Wibisono and H. Sofyandi, 2022. The effect of compensation and work motivation on employee loyalty at Harbour BrightShoes. *Technium Social Sciences Journal* 32(1), 548-557.
- Saleem, S., 2011. The impact of financial incentives on employees' commitment. *European Journal of Business and Management* 3(4), 258-266.
- Sari, E.T., 2018. Motivation and satisfaction towards employees' loyalty to achieve company's advantage. *JMBI Unsrat (Journal Ilmiah Management Bisnis Dan Inovasi Universitas Sam Ratulangi)* 4(1), 69-81.
- Spakovska, K., M. Ballarin, M. Vanek, and J. Chlopecky, 2015. Influence of motivation on work performance and loyalty of employees in industrial enterprises. *International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management* 3(1), 399-406.
- Sukawati, T. B. W., and I. G. M. Suwandana, 2021. Effect of physical work environment, workload, and compensation on employee loyalty at Visesa Ubud Resort. *American Journal of Humanities and Social Sciences Research (AJHSSR)* 5(2), 399-408.
- Susita, D., A. Saptono, J. Susono and A. Rahim, 2020. The effect of career development and work environment on employee loyalty with work satisfaction as intervening variables. *The International Journal of Social Sciences World (TIJOSSW)* 2(2), 20-31.
- Tessema, M. T., J. K. Ready and B. A. Embaye, 2013. The effects of employee recognition, pay, and benefits on job satisfaction: Cross Country Evidence. *Journal of Business and Economics* 14(1), 1-12.
- Thapa, N., 2016. Impact of training and motivation on employees' performance in Nepalese commercial banks. *Nepalese Journal of Business* 3(4), 78-91.
- Widiani, K. S. A., and G. S. Wayan, 2020. The influence of job experience, job performance, and employee loyalty on job promotion. *American Journal of Humanities and Social Sciences Research* 4(12), 113-118.

Chapter 8

HR intervention for stress management: A case of Nepalese organizations

- Rakshya Sen and Sumit Pradhan*

Abstract

This study examines the HR intervention for stress management in Nepalese organization. Stress management is selected as the dependent variable. The selected independent variables are job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, and work life balance. The primary source of data is used to assess the opinions of the respondents regarding job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, work life balance, and stress management. The study is based on primary data of 100 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of HR intervention for stress management in Nepalese organization.

The study showed that job analysis/design has a positive impact on stress management. It indicates that better job design brings role clarity which can be used as stress management technique. Similarly, training and development has a positive impact on stress management. It indicates that proper training and development can increase the employee performance which can be used as stress management technique. Likewise, employee assistance program has a positive impact on stress management. It indicates that introducing EAP in an organization can result in improvement in mental health which can gradually work as stress management technique for employees. In addition, pay and promotion has a positive impact on stress management. It indicates that attractive pay & promotion in an organization leads to increase in employee satisfaction resulting effective stress management. Further, organization culture has a positive impact on stress management. It indicates that good organizational culture in an organization can lead to reduce absenteeism of employee which can be one of stress management techniques. Moreover, work life balance has a positive impact on stress management. It indicates that better work life balance leads to increase in employee productivity resulting effective stress management technique.

Keywords: job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, work life balance, stress management

1. Introduction

Stress at work has become a widespread issue for all organizations that have been working hard to achieve excellence in the competitive world. Executives are exhausted due to constant workload pressures. The biggest problem today for big and small leaders is balancing personal and professional needs. Workplace stress is a worldwide issue that impacts productivity in organizations as well as the health and well-being of employees. Businesses have been dealing with a number of difficulties due to changes in the global economy. As a result of increased accountability and responsibility among the human resources employed by commercial organizations and the need to produce outcomes in a cut throat environment, workplace stress is becoming a typical occurrence. Organizations need to become more adaptive, resilient, agile, and customer-focused to succeed in the face of increased competition on both a local and international level. With this environment shift, the HR professional must adapt to become a strategic partner, an employee sponsor or advocate, and a change mentor within the company. In order to succeed, HR Professionals must carry out business driven function with a thorough understanding of the organization's big picture and be able to influence key decisions and policies (Mishra, 2017).

High level of job stress, lack of communication, lack of recognition, limited opportunity for

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growth, poor leadership approaches, unfavorable management practices, etc. are some of the reasons why employees become unsatisfied from their jobs. Management should actively seek to improve these factors if they hope to lower their turnover rate and increase the performance. If the employees of any organization are dissatisfied, then it will decline the level of customer satisfaction and ultimately reduce the performance of bank (Denisi, 2006). Susskind *et al.* (2000) described that job satisfaction represents the workplace and employees' perceptions of their job. Job satisfaction can be envisaged by levels of support an employee gets from his organization, the employment situation and employees' evaluation of the work climate in the organization. Fletcher & Payne (1980) identified that a lack of satisfaction can be a source of stress, while high satisfaction can alleviate the effects of stress. This study reveals that, both of job stress and job satisfaction were found to be interrelated. Likewise, Hira and Waqas (2012) showed satisfied workers is always a productive worker for an organization.

Gershon (2000) concurred that working under continuously stressful conditions leads to the dissatisfaction and exhaustion of police officers. The stressful conditions that law enforcement officers are exposed can affect both their work-related and their physiological wellbeing. Employees' constant exposure to stress, if not handled effectively, can be destructive both for them in terms of the quality of their work and their physical and mental state and for the organization where they work (Maslach, 2003). Likewise, Jaramillo *et al.* (2011) provided an insights on the interpersonal relations inside the organization, co-workers and conflict inside work groups that can range from hidden behaviours and disagreement up to the physical harm. Similarly, Davis & Newstrom (2008) explained that if the stress becomes too great, work performance will begin to decline, because stress interferes with the implementation of work. Employees lose the ability to control them, become incapable of making decisions, and their behavior becomes erratic. The most extreme consequences are zero work performance, employees experience disturbances, become sick and can no longer work, despair, leave or refuse to work to avoid stress. Further, Schorr (2001) stated that stress causes problems in the workplace which negatively affect employee health and organizational productivity. Stress can lead to problems such as job dissatisfaction, alcoholism, absenteeism, physical ailments, and poor job performance.

Masi and Jacobson (2003) studied the outcome measurements of an integrated employee assistance and work-life program. The study stated that after services, stress levels decreased, attendance improved, work performance improved, and relationships with supervisors and coworkers improved. Similarly, Preece *et al.* (2006) determined the relevance of an employee assistance program to the treatment of workplace depression. The study showed that employees identified as depressed continued to be more impaired at closing on all indicators than employees not identified as depressed. More intensive psychosocial treatment may be required to optimize work functioning among depressed employees. Likewise, Harlow (2007) studied the clinical effectiveness of an EAP providing Problem Resolution and Brief Counseling (PRBC) through a pre- and post-treatment clinical assessment. The study suggested that the PRBC produces positive clinical outcomes. In addition, the results also suggested that the degree of clinical improvement relates positively to self-reported improvement in work performance. Further, Biding and Nordin (2014) examined the effects of a stress management intervention program on self-perceived depression, anxiety, and stress among hotel employees. The study suggested that management should consider the adoption of an intervention like SMIP as part of employee assistance program (EAP) to hotel and other employees to sustain their psychosocial well-being and productivity. In addition, Jiony *et al.* (2015) investigated the relationships between employee engagement and organization culture and to explore what drives employee engagement. The study concluded that when there is proper and effective communication is in place, members of the organization could manage their job better.

Stephen and Stephen (2016) analyzed the impact of organizational culture and its impact on employee performance and job satisfaction. The study concluded that majority of the respondents' agree that organizational culture does have an impact on performance and satisfaction levels of employees. Similarly, Nunes *et al.* (2018) examined the effect of employee assistance services on reductions in employee absenteeism. The study revealed that EAP services were most effective in helping clients move from moderate to low levels of sick leave rather than in reducing sick leave for those experiencing chronic absenteeism. Likewise, Suresh *et al.* (2020) identify the stress management among employees working in selected Auto components manufacturing Industries in Chennai. The study concluded that tension; headache is some of the symptoms caused due to stress. Further, Jamil *et al.* (2022) assessed the mediation role of employee turnover factors including (employee overworked, lack of feedback, lack of growth, lack of recognition, and lack of reward) with job satisfaction. The findings showed that a Sobel test revealed that organizational culture strongly mediates the association between employee turnover factors (employee overworked, lack of feedback, lack of growth, lack of recognition, lack of reward) and job satisfaction in selected private businesses in Iraq's Kurdistan.

In the context of Nepal, Neupane (2019) concluded that the major influencing factors for job satisfaction are salary, followed by training and promotion, working environment and cooperation among them. The study came to the further conclusion that raising the amount of financial rewards, performance appraisal systems, promotion strategies, and training and development programs enhances employees' overall satisfaction. Similarly, Rijal (2018) indicated that salary and benefits have positive relationship with employee performance of Nepalese commercial banks. Likewise, Chapagai (2011) discovered a positive relationship between the employee participation and job satisfaction in Nepalese banking sector. But the demographic variable such as gender, age and service year have no significant correlation with the job satisfaction dimension. According to Manandhar (2011), social support from family and social support from work place have significant positive relationship on work life balance of employee. Further, Shrestha and Yukongdi (2020) suggested that affective commitment and job satisfaction had negative effect while job stress has a positive influence on turnover intentions followed by job stress and affective commitment.

The above discussion shows that empirical evidences vary greatly across the studies on the HR intervention for stress management. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the HR intervention for stress management: A case of Nepalese organization. Specifically, it examines the relationship of job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, and work life balance with stress management in the context of Nepalese organizations.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 100 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, work life balance, and stress management. The study is based on descriptive and causal comparative research designs.

The model

The model estimated in this study assumes that stress management depends upon job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, and work life balance. Therefore, the model takes the following form:

$$SM = \beta_0 + \beta_1 JA + \beta_2 TD + \beta_3 EAP + \beta_4 PP + \beta_5 OC + \beta_6 WB + \epsilon$$

Where,

SM = Stress Management

JA = Job Analysis/Design

EAP = Employee Assistance Program

PP = Pay & Promotion

OC = Organizational Culture

WB = Work- Life Balance

Stress management was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Job design brings role clarity among employees”, “Organization culture is crucial factor for employees’ performance” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.810$).

Job Analysis/Design was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “My job design clearly defines goals”, “I experience personal growth such as updating skills and learning different jobs” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.722$).

Training and development was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “My organization considers training as part of organization strategy”, “I believe training helps to improve employee and employers relationship” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.828$).

Employee assistance program was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “I know the concept of employee assistance Program”, “I feel valued when the organization provides counselling service to my problems related to legal, financial or family issues” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.756$).

Pay and promotion was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “I am satisfied with salary offered to me by my organization”, “I feel valued when organization sees my hard work and provides advancement opportunity within organization” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.866$).

Organizational culture was measured using a 5-point Likert scale where the respondents were

asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “I believe regular communication and feedback from my supervisor gives me sense of involvement”, “My organization has prioritize diversity, equity and inclusion” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.840$).

Work-life balance was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “I feel stressed when I do not have enough time to complete everything I need to do”, “I am often distracted by personal/family worries at work” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.834$).

The following section describes the independent variables used in this study along with the hypothesis formulation:

Job analysis/design

Job design has been of the most effective tools used for optimizing employees’ performance. Companies that regularly conduct job analysis possess a much better knowledge of their employees’ strengths and limitations, and can take timely corrective action to improve any deficiencies in their skills and job behavior (Clifford, 1994). Employees with a job design due to their determination, invest their hand, head and heart to job (Ashforth & Humphrey, 1995). Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between job design and stress management.

Training and development

Stress management refers to the act of developing and implementing strategies or interventions to reduce or control (Reid-Searl *et al.*, 2013). Effective stress management interventions to help nurses improve their adaptation to the workplace-related stress are extremely desirable (Ramezanli *et al.*, 2015). Combination of both stress reduction interventions related to the work environment and the personnel are found to be effective because stressors could be direct results of work demands or related personal demands (Waqas *et al.*, 2019). Tangthong *et al.* (2015) stated that training and development lead to superior knowledge, skills, abilities, attitudes, and behavior of employees that ultimately enhances financial and non- financial performance of the organizations. Similarly, Absar *et al.* (2012) assessed the impact of HR practices on job satisfaction in the context of Bangladesh. The study found that human resource planning, and training and development have positive impact on job satisfaction. Based on it, this study develops the following hypothesis:

H₂: There is positive relationship between training and development and stress management.

Employee assistance program

The provision of confidential assessment, counselling, and therapeutic services for employees and dependents experiencing a wide range of personal, emotional and psychological problems, with a telephone helpline for advice and information on domestic, legal, medical and financial matters. The rapid growth of these programs has been partly because of the phenomenon of workplace stress (Coles, 2003). Ramanathan (1992) found that EAPs are an effective means for helping employees deal with stressors, enhance performance, reduce work-related accidents, and cut down healthcare-related costs. According to Bunn (2010), EAPs are of importance to forward-thinking employers and these programs can help them to address the main reason for lost performance. An employer with an established EAP

unit can offer, attract and improve talent more than employers without an EAP (Grobler *et al.*, 2006). Based on it, this study develops the following hypothesis:

H₃: There is positive relationship between employee assistance program and stress management.

Pay and promotion

Rewards can be defined as a person receiving it in exchange for doing some tasks which is beneficial for the company. Reward means anything the company gives its employees in exchange for their contributions (Chiang *et al.*, 2010). Ratri & Wahjudono (2021) showed a significant results in the relationship between job stress and performance and the relationship between reward and job satisfaction. Similarly, Weerasinghe *et al.* (2017) examined the factors affecting job satisfaction of banking employees in Sri Lanka. The study found that salary has a positive and significant impact on employee's job satisfaction. Similarly, Ali and Ahmed (2009) revealed that there is a significant positive relationship between reward and employee performance. Likewise, Iqbal *et al.* (2019) showed that performance-based pay and employee training have a positive relationship with employee productivity. Based on it, this study develops the following hypothesis:

H₄: There is positive relationship between pay and promotion and stress management.

Organizational culture

The set of beliefs, standards, and customs that govern an organization's behavior and serve as a basis for all team members' decisions is known as the organization's culture. Organizational culture is defined as a complex set of values, beliefs, assumptions and symbols that define the way in which an organization conducts its business (Barney, 1986). In light of this definition, different organizations can be regarded as having their own cultures, which affect or influence the attitudes and the behaviors of their employees (Flamholtz, 2001). Katwyk *et al.* (2000) found that organizational culture is often regarded as an invisible principle to organizational members (i.e. a collective value indicating how people are supposed to behave within the organization). Similarly, Shahar *et al.* (2004) revealed that dictatorial communication style and excessive demands of organizational commitment served as stress accumulators, as employees neither committed to nor accepted these imposed values. Likewise, Lapiņa *et al.* (2015) stated that organizational culture is able to influence organizational effectiveness and performance. In addition, Widarsih *et al.* (2018) found that organizational culture has a positive effect on performance. Further, Hafidhah & Martono (2019) concluded that there is a positive and significant effect of perceived organizational support and organizational culture on performance. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between organizational culture and stress management.

Work-life balance

Work-life balance is defined as the absence of conflict between work and family or personal roles (Quick *et al.*, 2004). Work-life balance is the degree to which an individual can simultaneously balance the emotional, behavioral and time demands of both paid work, family and personal duties (Hill *et al.*, 2001). In contrast, work-life conflict occurs when involvement in one domain, for example work or personal life, interferes with involvement in the other domain (Hanson *et al.*, 2006). Moore (2007) argued that organizations that provide long-term work-life balance cultures, create employee-company loyalty and positive employee attitudes to work. Government and organizational practices are found to promote work-life balance. While government welfare policies were found to promote work-life balance, the traditional gender-based domestic division of work seems to increase work-life

conflict (Crompton & Lyonette, 2006). Based on it, this study develops the following hypothesis:

H₆: There is positive relationship between work life balance and stress management.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with mean and standard deviation has been computed and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 100 observations. The dependent variable is SM (Stress management). The independent variables are JA (Job analysis/design), TD (Training & development), EAP (Employee assistance program), PP (Pay & promotion), OC (Organizational culture), and WLB (Work life balance).

Variables	Mean	S.D.	SM	JA	T&D	EAP	P&P	OC	WLB
SM	4.475	0.587	1						
JD	3.899	0.585	0.474**	1					
T&D	4.200	0.557	0.528**	0.518**	1				
EAP	4.143	0.522	0.471**	0.415**	0.509**	1			
P&P	4.114	0.505	0.625**	0.518**	0.496**	0.623**	1		
OC	4.182	0.537	0.638**	0.481**	0.564**	0.529**	0.624**	1	
WLB	4.103	0.639	0.673**	0.515**	0.605**	0.454**	0.565**	0.527**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 1 shows that job design is positively correlated to stress management. It implies that better job design brings role clarity which can be used as stress management technique. Likewise, the result also reveals that training & development is positively correlated to stress management. It implies that proper training and development can increase the employee performance which can be used as stress management technique. Moreover, employee assistance program is positively correlated to stress management indicating that introducing EAP in an organization can result in improvement in mental health which can gradually work as stress management technique for employees. Furthermore, pay & promotion is positively correlated to stress management indicating that attractive pay & promotion in an organization leads to increase in employee satisfaction resulting effective stress management. Similarly, the result also revealed that organizational culture is positively correlated to stress management indicating that good organizational culture in an organization can lead to reduce absenteeism of employee which can be one of stress management techniques. In addition, work life balance is positively correlated to stress management. It reveals that better work life balance leads to increase in employee productivity resulting effective stress management technique.

Regression analysis

Having analyzed the Kendall's Tau correlation coefficients matrix, the regression analysis has been carried out and the results are presented in Table 1. More specifically, it presents the regression results of job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, and work life balance on stress management.

Table 2

Estimated regression results of job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, and work life balance on stress management

The results are based on 100 observations using linear regression model. The model is $SM = \beta_0 + \beta_1 JA + \beta_2 TD + \beta_3 EAP + \beta_4 PP + \beta_5 OC + \beta_6 WLB + \epsilon$, where the dependent variable is SM (Stress management). The independent variables are JA (Job analysis/design), TD (Training & development), EAP (Employee assistance program), PP (Pay & promotion), OC (Organizational culture), and WLB (Work life balance).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		JA	T&D	EAP	P&P	OC	WLB			
1	1.18 (3.82)**	0.71 (10.10)**						0.400	0.430	102.0
2	1.53 (6.32)**		0.66 (11.48)**					0.460	0.400	131.80
3	1.88 (9.15)**			0.57 (11.89)**				0.480	0.390	141.48
4	1.26 (5.12)**				0.703 (12.45)**			0.500	0.390	154.99
5	1.61 (6.99)**					0.63 (11.70)**		0.470	0.400	136.99
6	1.17 (5.30)**						0.73 (14.23)**	0.570	0.360	202.49
7	0.93 (3.27)**	0.30 (3.66)**	0.46 (5.71)**					0.500	0.390	78.14
8	0.92 (3.48)**	0.18 (2.24)*	0.29 (3.47)**	0.37 (4.78)**				0.570	0.360	67.43
9	0.69 (2.65)**	0.09 (1.20)	0.21 (2.55)**	0.35 (3.35)**	0.31 (3.99)**			0.610	0.340	59.72
10	0.59 (2.29)**	0.07 (0.93)	0.20 (2.53)**	0.13 (1.45)	0.31 (3.99)**	0.212 (2.39)*		0.620	0.340	50.45
11	0.48 (1.96)	0.04 (0.52)	0.12 (1.60)	0.12 (1.60)	0.21 (2.76)**	0.21 (2.76)**	0.33 (3.98)**	0.650	0.320	49.29

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Stress management is the dependent variable.

Table 2 shows that the beta coefficients for job analysis/design are positive with stress management. It indicates that job analysis/design has a positive impact on stress management. This finding is similar to the findings of Ashforth and Humphrey (1995). Similarly, the beta coefficients for training and development are positive with stress management. It indicates that training and development has a positive impact on stress management. This finding is consistent with the findings of Absar *et al.* (2012). Likewise, the beta coefficients for employee assistance program are positive with stress management. It indicates that employee assistance program has a positive impact on stress management. This finding is similar to the findings of Ramanathan (1992). Further, the beta coefficients for pay & promotion are positive with stress management. It indicates that pay & promotion has a positive impact on stress management. This finding is consistent with the findings of Weerasinghe *et al.* (2017). In addition, the beta coefficients for organizational culture are positive with stress management. It indicates that organizational culture has a positive impact on stress management. This finding is similar to the findings of Widarsih *et al.* (2018). Moreover, the beta coefficients for work life balance are positive with stress management. It indicates that work life balance has a positive impact on stress management. This finding is similar to the findings of (Parkes & Langford, 2008).

4. Summary and conclusion

In today's world, stress and anxiety are common and accepted aspects of daily life. Although science

and technology have advanced, the economy has expanded significantly, and there are more luxuries available than ever before, the majority of people worldwide appear to be under moderate to high levels of stress in a variety of areas of their lives. The business industry has seen quick and noticeable changes over the past ten years, including changes in policies, layoffs, privatization, computerization, the introduction of new technology, etc. Due to rising competitiveness, these changes have occurred quite unconsciously. The introduction of new technology in all spheres of life, along with globalization and privatization policies, have fundamentally altered traditional labor and contact patterns across all industries. Due to the industry's extensive use of computers, workers' work habits have changed, making it necessary to reduce the workforce. Stress at work has become a widespread issue for all organizations that have been working hard to achieve excellence in the competitive world. Executives are exhausted due to constant workload pressures. The biggest problem today for big and small leaders is balancing personal and professional needs. Workplace stress is a worldwide issue that impacts productivity in organizations as well as the health and well-being of employees. Businesses have been dealing with a number of difficulties due to changes in the global economy. As a result of increased accountability and responsibility among the human resources employed by commercial organizations and the need to produce outcomes in a cut throat environment, workplace stress is becoming a typical occurrence.

This study attempts to examine the HR intervention for stress management: A case of Nepalese organization. The study is based on primary data with 100 observations.

The major conclusion of this study is that job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, and work life balance have positive impact on stress management. It indicates that stress management would be effectively managed with clear job analysis/design, training and development, employee assistance program, pay and promotion, organization culture, and work life balance. Similarly, the study also concluded that work life balance is the most significant factor followed by pay and promotion that explains the changes in the stress management policy in the context of Nepalese organizations.

References

- Absar, N., B. Nimalathasan, & M. Mahmood, 2012. HRM-market performance relationship: evidence from Bangladeshi organizations. *South Asian Journal of Global Business Research* 1(2), 238-255.
- Ali, R., & M. S. Ahmad, 2009. The impact of reward and recognition programs on employee's motivation and satisfaction: an empirical study. *International Review of Business Research Papers*, 5(4), 270-279.
- Ashforth, E. and H. Humphrey, 1995. Emotion in the Workplace: A Reappraisal. *Human Relations* 48(2), 97- 125.
- Barney, J. 1986. Organizational culture: Can it be a source of sustained competitive advantage? *Academy of Management Review* 11(3), 656-665.
- Biding, C., & R. B. Nordin, 2014. Effects of a stress management intervention program on self-perceived depression, anxiety, and stress among hotel employees: A quasi-experimental study. *Psychosocial Factors at Work in the Asia Pacific* 339-353.
- Bunn, W.B., 2010. Using employee assistance programs to measurably improve mental health and performance. *Journal of Health & Productivity* 6(2), 1-4.
- Chapagai, R. R., 2011. Impact of employee participation on job satisfaction in Nepalese commercial banks. *PYC Nepal Journal of Management* 4(1), 39-51.
- Chiang, F. F., T. A. Birtch, & H. K. Kwan, 2010. The moderating roles of job control and work-life balance practices on employee stress in the hotel and catering industry. *International Journal of Hospitality Management* 29(1), 25-32.
- Clifford, J., 1994. Job analysis: Why do it and how should it be done? *Public Personnel Management* 23, 321-340.

- Coles, A., 2003. Counseling in the workplace. Maidenhead, Berkshire: Open University Press.
- Crompton, R., 2001. Gender restructuring, employment, and caring. *Social Politics: International Studies in Gender, State & Society* 8(3), 266-291.
- Davis, K., & W. Newstrom, 2008. Behavior in Organizations. VII Edition. Volume II. Jakarta: Erlangga.
- Flamholtz, E. J. 2001. Corporation culture and the bottom line. *European Management Journal* 19(3), 268-275.
- Fletcher, C., 2002. Appraisal: An individual psychological analysis. Psychological Management of Individual Performance. Chichester: John Wiley, pp. 115-135.
- Grobler, P., S. Wörnich, M. R. Carrell, N. F. Elbert, & D. R. Hatfield, 2006. Human resource management in South Africa, 3rd ed. High Holborn: Thompson Learning.
- Hafidhah, R. N., & S. Martono, 2019. The effect of perceived organizational support, job stress, and organizational culture on job performance. *Management Analysis Journal* 8(2), 177-187.
- Hanson, G. C., L. B. Hammer, & C. L. Colton, 2006. Development and validation of a multidimensional scale of perceived work-family positive spillover. *Journal of Occupational Health Psychology* 11(3), 249-265.
- Harlow, K. C., 2007. The effectiveness of a problem resolution and brief counseling EAP intervention. *Journal of Workplace Behavioral Health* 22(1), 1-12.
- Hill, E. J., A. J. Hawkins, M. Ferris, & M. Weitzman, 2001. Finding an extra day a week: The positive influence of perceived job flexibility on work and family life balance. *Family Relations* 50(1), 49-54.
- Hira, A., & I. Waqas, 2012. A study of job satisfaction and its impact on the performance in the banking industry of Pakistan. *International Journal of Business and Social Science* 3(19), 28-56.
- Iqbal, S., H. Tian, S. Akhtar, & J. Sohu, 2019. Impacts of performance-based pay on employee productivity; mediated by employee training. *International Journal of Research and Review* 6(10), 235-241.
- Jamil, D. A., K. K. Sabah, B. Gardi, & S. Adnan, 2022. The mediation role of organizational culture between employee turnover intention and job satisfaction. *Inter-national Journal of Teaching, Learning and Education* 1(4), 24-35.
- Jaramillo, F., J. P. Mulki, and J. S. Boles, 2011. Workplace stressors, job attitude and job behaviors: Is interpersonal conflict the missing link? *J. Pers. Sell. Sales Manag.* 31(3), 339-356.
- Jiony, M. M., G. H. Tanakinjal, D. Gom, & R. S. Sigamul, 2015. Understanding the effect of organizational culture and employee engagement on organizational performance using organizational communication as mediator: a conceptual framework. *American Journal of Economics* 5(2), 128-134.
- Katwyk, V.P.T., S. Fox, P. E. Spector, and K. Kelloway, 2000. Using the job-related affective well-being scale (JAWS) to investigate affective responses to work stressors. *Journal of Occupational Health Psychology* 5, 219-30.
- Lapiņa, I., D. Aramina, & I. Kairiša, 2015. Influence of organizational culture on the continuous improvement: empirical study at university. *Cybernetics and Informatics* 1, 76-81.
- Manandhar, S., 2011. Impact of workplace support on work-life balance and employees' commitment to professional working mothers in Kathmandu Valley. *A Peer Reviewed Journal*, 145-156.
- Masi, D. A., & J. M. Jacobson, 2003. Outcome measurements of an integrated employee assistance and work-life program. *Research on Social Work Practice* 13(4), 451-467.
- Maslach, C., 2003. Job burnout: new directions in research and intervention. *Current Directions in Psychological Science* 12(5), 189-192.
- Mishra, P., 2017. Green human resource management: A framework for sustainable organizational development in an emerging economy. *International Journal of Organizational Analysis* 25(5), 762-788.
- Moore, F., 2007. Work-life balance: contrasting managers and workers in an MNC. *Employee Relations* 29(4), 385-399.

- Neupane, B., 2019. A study on factors influencing the job satisfaction of bank employees in Nepal (With special reference to Kathmandu, Lalitpur, and Bhaktapur District). *NCC Journal* 4(1), 9-15.
- Nunes, A. P., M. K. Richmond, F. C. Pampel, & R. C. Wood, 2018. The effect of employee assistance services on reductions in employee absenteeism. *Journal of Business and Psychology* 3(3), 699-709.
- Preece, M., P. M. Cayley, U. Scheuchl, & R. W. Lam, 2006. The relevance of an employee assistance program to the treatment of workplace depression. *Journal of Workplace Behavioral Health* 21(1), 67-77.
- Quick, J. D., A. B. Henley, & J. C. Quick, 2004. The balancing act: At work and at home. *Organizational Dynamics* 33(4), 426-438.
- Ramanathan, C. S., 1992. EAPs response to personal stress and productivity: Implications for occupational social work. *Social Work* 37(3), 234-240.
- Ramezanli, S., A. R. Koshkaki, M. Talebizadeh, Z. B. Jahromi, & M. K. Jahromi, 2015. A study of the coping strategies used by nurses working in the intensive care units of hospitals affiliated to Jahrom University of Medical Sciences. *International Journal of Current Microbiology and Applied Sciences* 4(4), 157-163.
- Ratri, K. G. R., & D. B. K. Wahjudono, 2021. The role of employee demographics, work stress, and rewards on job satisfaction and employee performance. *Jurnal Aplikasi Manajemen* 19(3), 634-648.
- Reid-Searl, K., B. Happell, T. Dwyer, C. M. Caperchione, C. J. Gaskin, & K. J. Burke, 2013. How nurses cope with occupational stress outside their workplaces. *Collegian* 20(3), 195-199.
- Rijal, R., 2023. Factors influencing employee retention in the Nepalese tourism and hospitality sector. *Nepalese Journal of Hospitality and Tourism Management* 4(1), 1-20.
- Schorr, L., 2001. Coping with stress, boosting productivity. *Employment News* 23-26.
- Shahar, G., T. E. Joiner, D. C. Zuroff, and S. J. Blatt, 2004. Personality, interpersonal behavior, and depression: co-existence of stress-specific moderating and mediating effects. *Personality and Individual Differences* 36, 1583-1596.
- Stephen, E. N., & E. A. Stephen, 2016. Organizational culture and its impact on employee performance and job satisfaction: A case study of Niger Delta University, Amassoma. *Higher Education of Social Science* 11(5), 36-45.
- Suresh, R., A. Athapit, M. J. Prakash, & S. Radhika, 2020. A study on stress management among employees working in auto components industries. *Ilkogretim Online* 19(2), 2105-2121.
- Susskind, A. M., C. P. Borchgrevink, K. M. Kacmar, & R. A. Brymer, 2000. Customer service employees' behavioral intentions and attitudes: An examination of construct validity and a path model. *International Journal of Hospitality Management* 19(1), 53-77.
- Tangthong, S., J. Trimetsoontorn, & N. Rojniruttikul, 2015. The effects of HRM practices on firm performance in Thailand's manufacturing industry. *Journal for Global Business Advancement* 8(3), 250-282.
- Waqas, M., B. Naeem, A. Qammar, & F. Anwar, 2019. Personal demands and personal resources as facilitators to reduce burnout: A lens of self-determination theory. *Paradigms* 13(1), 40-46.
- Weerasinghe, I. M. S., C. J. Senavirathna, & H. H. Dedunu, 2017. Factors affecting to job satisfaction of banking employees in Sri Lanka special reference public and private banks in Anuradhapura District. *Business and Management Horizons* 5(1), 2326-2337.
- Widarsih, R. W., & Y. Supriyati, 2018. The effect of organizational culture, personality, and job satisfaction toward employees' performance in directorate general of industrial resilience and international access development. *International Journal of Scientific Research and Management* 6(03), 1-8.
- Yukongdi, V. and P. Shrestha, 2020. The influence of affective commitment, job satisfaction and job stress on turnover intention: a study of Nepalese bank employees. *Review of Integrative Business and Economics Research, Society of Interdisciplinary Business Research* 9(1), 88-98.

Chapter 9

Impact of social networking sites on employee work performance: A case of Nepalese commercial banks

- Kamana Khadka and Ramesh Rawat*

Abstract

This study examines the impact of social networking sites on employee work performance in the context of Nepalese commercial banks. Employee performance is selected as the dependent variable. The selected independent variables are usefulness, subjective norms, ease of use, intensity of use, and availability. The primary source of data is used to assess the opinions of the respondents regarding usefulness, subjective norms, ease of use, intensity of use, availability, and employee performance. The study is based on primary data of 120 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of social networking sites on employee work performance: A case of Nepalese commercial banks.

The study showed that usefulness has a positive impact on employee performance. It indicates that increase in social networking sites' usefulness or quality leads to increase in employee performance. Similarly, subjective norms has a positive impact on employee performance. It indicates that social norms or expectations that employees perceive from their managers, co-workers, or the organization as a whole typically have a positive influence on employee performance. Likewise, ease of use has a positive impact on employee performance. It indicates that employees usually do better when a system, instrument, or procedure is simple to use. In addition, intensity of use has a positive impact on employee performance. It indicates that increase in intense use of specific tools, resources, or activities leads to increase in employee performance. Further, availability has a positive impact on employee performance. It indicates that availability or use of social media platforms leads to increase in employee performance.

Keywords: usefulness, subjective norms, ease of use, intensity of use, availability, employee performance

1. Introduction

Every business uses social networking sites for business purposes, like building relationships with customers. Now is the time for companies to build their workforce to adapt to surroundings that are changing. The organization's earnings and efficiency depend on how well its employees do their jobs, and those employees are very active on social networks. On a different level, social networks give businesses dangers, chances, threats, flaws, and strengths. Because social networks let people talk to each other in real time, they can share information about an organization that they might not want people outside of the organization to see. This can be a risk. There was an opportunity when an employee of a rival shared information about a future strategy on a social media site that could be used to help the company. Businesses may face a threat when their workers talk about sensitive information about the business on social networks where rivals can see it. When it hurts an organization's output, social networking can be seen as a weakness. When used to build good relationships with workers, guide them in the right direction, gather information about their behavior, and train them, the same social networking sites can be a strength for businesses (Ashraf and Javed, 2014). There are five principal risks that organization has in regard to social networking: perceived loss in staff productivity, data leakage from staff gossiping freely in an open environment, damage to a business's reputation, scam practiced by cyber crooks, and the open access to organization information due to outdated passwords (Wilson, 2009).

In this digital world, social networking sites are essential tools for businesses in many fields. They help build and maintain relationships with customers. With these platforms, businesses have a

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chance to connect with their audience, spread the word about their brand, and get useful feedback, all of which help the business grow and be successful. But because the business world is changing so quickly, it's important for companies to not only use social media to connect with customers, but also to train their employees to be flexible in the face of these changes. A company's general productivity, creativity, and efficiency depend on how well its employees do their jobs. These employees are often very busy on social networks. This activity can be both good and bad. It can improve teamwork, sharing of information, and employee involvement, but it also needs a well-thought-out plan to make sure that the exchanges are in line with the company's values and goals. As companies try to stay competitive, they need to make sure their employees know how to use social media to communicate with customers and with each other. This is important for both maintaining and improving the performance of the company (Sapountzi and Psannis, 2018). Social networking is a way in which many individuals come together and form many sized groups. These groups may be big, small, formal, informal, intentional or unintentional. When organized method through which groups are formed, help is acquired, information is conveyed, and actions are taken to achieve certain outcomes. When it comes to online social networking, sites are commonly used. These sites are known as social networking sites. Social networking sites has led to fundamental changes in the ways people interact in both the employee and organization (Martensen *et al.*, 2011).

Moqbel *et al.* (2013) examined the use of social networking sites by organizational members and its effect on job satisfaction, organizational commitment, and job performance. The study showed that social networking site use intensity has a significant positive effect on job performance through the mediation of job satisfaction, and that this mediating effect is itself mediated – in a nested way – via organizational commitment. The findings suggested that social networking site use, rather than causing presenteeism, may be a new way through which employees balance their work-life realms, in turn benefitting their organizations. Similarly, Akinbode *et al.* (2013) determined the impact of online social networking (OSNs) on employees' commitment to duties in the private and public organizations in Lagos State, Nigeria. The study concluded that online social networking cannot be stopped in the present-day organization but managed to yield positive result for the organization. Likewise, Kandiero *et al.* (2014) explored the link between social networking and employee productivity as well as organizational performance. The key findings are social networking provides enhanced levels of employee productivity. Business advantages and benefits of social networking in the workplace are still underappreciated and undervalued; Social networking technology can facilitate improved workplace productivity by enhancing the communication and collaboration of employees which aids knowledge transfer and consequently makes organizations more agile. It is concluded that this technology can be used to increase collaboration between individuals who share a common interest or goal. Increased collaboration will stimulate knowledge sharing between individuals, with the possible effect of increased productivity.

Ashraf and Javed (2014) examined the impact of social networking like Facebook, Twitter, Slideshare, LinkedIn, etc. at employee's performance. The study showed that using of social networking have strong impact on employee performance. Social networking by employee's affects their skills/ability, knowledge/qualification, productivity/outcomes and motivation level. Similarly, Cao *et al.* (2016) investigated the influence of social media on employees' work performance, as well as the underlying mechanism for how they create value at work. The study stated that shared vision and knowledge transfer positively influence work performance. Although network ties and trust do not have a direct impact on work performance, the influence is partially mediated by knowledge transfer. Likewise, Yeshambel *et al.* (2016) examined the extent of social media participation by employees and its effect on their productivity. The study concluded that employees participate in social media in the workplace for both work and non-work-related activity. Social media has the potential to allow

employees to form collaborations and communities for knowledge creation and sharing, better channels of communication, which enhance employee productivity. Further, Radhakrishnan *et al.* (2018) examined the impact of social media usage on employee and organization performance. The study found no significant impact of the other two dimensions of social media usage (knowledge sharing and communication) on employee high performance and organizational performance.

Aboelmaged (2018) assessed the impact of utilitarian and hedonic motivations on using enterprise social network (ESN) systems for sharing internal and external knowledge, as well as their effects on employee productivity. The results showed that using an ESN to share both internal (within the organization) and external (outside the organization) knowledge has a significantly positive effect on employee productivity. This means that when employees use ESNs to exchange knowledge, it leads to better performance and higher efficiency. Similarly, Cetinkaya and Rashid (2018) examined the effect of use of social media on employees' job performance and the mediating effect of an organizational structure. The study revealed that organizational structure positively mediates this relationship, meaning that the way an organization is structured (e.g., its hierarchy, communication channels, and formal policies) influences how effectively social media use translates into improved job performance. A supportive and well-designed organizational structure might enhance the benefits of social media, while a rigid or poorly designed structure might diminish them. Likewise, Javed *et al.* (2019) explored the relationship of social networking sites (SNSs) addiction on nurses' performance and how this relationship was mediated by task distraction and moderated by self-management. The results showed that self-management mediates the relationship between SNSs addiction and employees' performance. Moreover, the results of the study confirm that self-management reduces the negative impact of SNSs addiction on nurses' performance. Social networking sites (SNSs) addiction and task distraction reduce the nurses' performance, whereas self-management enhances nurses' performance.

Doshi and Nigam (2024) employed the media synchronicity theory (MST) to establish the validity of a framework. The study found that the enhancement of information sharing among employees has a beneficial impact on both individual and group performance inside the business. The employee's job performance was enhanced by a shared vision, whereas network links and trust had a detrimental impact on work performance. Similarly, Zahmat Doost and Zhang (2024) examined the potential curvilinear impact of social media usage (SMU) on job performance in the workplace. The study showed that Cyber loafing has a detrimental impact on the association between Social Media Use (SMU) and work performance. Additionally, there is a strong combined effect of job complexity and Cyber loafing. Likewise, Chen *et al.* (2023) investigated the effect of enterprise social media (ESM) on employees' competency. The study emphasized the potential advantages of employing ESM in firms to strengthen employees' skills through enhanced information exchange. Additionally, it highlights the significance of information relevance in assessing the efficacy of ESM in enhancing employee competency. Further, Alzaabi and Alshehhi (2023) investigates the adverse effects of Facebook, X (formerly known as Twitter), Instagram, and TikTok on employee productivity, psychological well-being, and organizational health. The study revealed that an overabundance of social media usage negatively impacts collaboration, interpersonal communication, team spirit, and organizational culture. In addition, Moughal *et al.* (2023) explores the capacity of social networking sites (SNS) to improve employee performance, using the Unified Theory of Acceptance and Use of Technology (UTAUT) as a guide. The study found significant significance as they provide firms with practical insights on how to effectively use social networking sites (SNS) and targeted marketing to improve staff productivity and enhance overall performance outcomes.

In the context of Nepal, Thapa *et al.* (2023) examined the influence of social media use on employee self-confidence and explore the moderating role of age in the relationship between social media use and employee self-confidence. The study revealed that social media use has a significantly

positive influence on employee self-confidence ($\text{Beta} = 0.588, p < 0.001$). Age significantly moderates the relationship between social media use and employee self-confidence, with beta values indicating a negative relationship. Social media use is gaining popularity, even in health institutes. Similarly, Shrestha *et al.* (2024) assessed the influence of social media on employee privacy in service sector businesses in Nepal. The study concluded that necessity for enterprises to have explicit protocols in order to safeguard employee privacy in the era of digital technology. Likewise, Shrestha and Jeong (2015) analyzed the challenges, threats and potential problems in the working environment of Pokhara University due to application of Internet tools and technology. The study found that web surfing for recreational purposes is a major time-waster in the workplace. Moreover, these challenges extend beyond technical concerns to include social, legal, and ethical implications, underscoring the need for a holistic approach.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of social networking sites on employee work performance: A case of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of social networking sites on employee work performance: A case of Nepalese commercial banks. Specifically, it examines the relationship of usefulness, subjective norms, ease of use, intensity of use, and availability with employee work performance in the context of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 120 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on usefulness, subjective norms, ease of use, intensity of use, availability, and employee performance. The study is based on descriptive and causal comparative research designs. Table 1 shows the list of commercial banks along with the number of the respondents selected for the study.

Table 1

List of sample commercial banks selected for the study along with the number of observations

S.N.	Name of the banks	Observations
1	Nabil Bank Limited	16
2	Standard Chartered Bank Nepal Limited	7
3	Himalayan Bank Limited	9
4	Nepal SBI Bank Limited	12
5	Everest Bank Limited	10
6	Global IME Bank Limited	17
7	Prime Commercial Bank Limited	6
8	NMB Bank Limited	10
9	NIC Asia Bank Limited	12
10	Siddhartha Bank Limited	10
11	Machhapuchchhre Bank Limited	11
Total number of respondents		120

Source: Field Survey, 2024

The model

The model estimated in this study assumes that employee performance depends upon usefulness, subjective norms, ease of use, intensity of use, and availability. Therefore, the model takes the following form:

$$EP = \beta_0 + \beta_1 U + \beta_2 SN + \beta_3 EU + \beta_4 IU + \beta_5 A + \varepsilon$$

Where,

EP = Employee performance

U = Usefulness

SN = Subjective norms

EU = Ease of use

IU = Intensity of use

A = Availability

Employee performance was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Social networking sites provide valuable resources and connections that improve employee efficiency”, “The user-friendly design of social networking sites makes it easy for employees to collaborate and share ideas” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.810$).

Usefulness was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Social networking sites can boost productivity by fostering better teamwork and communication”, “Employee performance improves when they have access to social networking sites because they can create valuable professional networks” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.787$).

Subjective norms was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Peer endorsement of high-performance habits on social networking platforms increases employee performance”, “Social networking sites can reveal the subjective norms that are prevalent in a workplace culture, which may influence employees’ performance” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.828$).

Ease of use was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Employees can access and interact with social networking sites quickly because to their simple interfaces”, “Simple social networking platforms encourage enhanced collaboration and communication among staff members, which boosts output” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.756$).

Intensity of use was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Using social networking sites more frequently can improve teamwork among

employees”, “Social networking site usage in moderation might enhance employee knowledge sharing” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.794$).

Availability was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There were 5 items and sample items include “Enhanced accessibility on social media platforms may divert workers, resulting in poor results”, “Regular usage of social networking sites can cause problems with time management, which can impair productivity” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.840$).

The following section describes the independent variables used in this study along with the hypothesis formulation:

Usefulness

Social networking platforms provide efficient communication and collaboration among employees. The efficacy of these technologies in facilitating instantaneous conversations, exchanging updates, and cooperating on projects might result in enhanced efficiency and expedited problem-solving. When employees view these platforms as helpful for improving their communication and cooperation, their overall performance frequently improves due to more unified and efficient work habits (Magnier-Watanabe *et al.*, 2010). Social networking sites (SNS) can function as important platforms for the exchange of knowledge and the acquisition of new information. Platforms that facilitate document sharing, discussion forums, and access to experts empower employees to efficiently locate information, exchange valuable perspectives, and acquire knowledge from their peers. According to Moqbel and Kock (2018), when workers see these platforms as valuable for acquiring knowledge and resolving work-related issues, it improves their capacity to carry out duties efficiently and make well-informed judgments. Social networking sites have a significant impact on employee performance by facilitating the management of work-life balance. Flexible communication solutions can enhance employees’ ability to properly balance their job duties with personal commitments. According to Yokoyama (2016), when employees find these tools beneficial for managing the equilibrium between their work and home life, they may see a decrease in stress levels and an enhancement in performance. Based on that, the research develops the following hypothesis:

H₁: There is a positive relationship between usefulness and employee performance.

Subjective norms

The subjective norms related to social networking sites exert a substantial influence on employee performance. The workplace culture, peer behavior, and social expectations define the norms that impact how employees use social networking sites and incorporate them into their work routines. Comprehending and conforming to these personal standards can assist firms in utilizing social networking sites (SNS) efficiently to improve employee performance, contentment, and overall productivity (Choi and Chung, 2013). The organizational culture and expectations have a significant impact on shaping the subjective norms related to the usage of social networking sites (SNS). If the business encourages and endorses the utilization of social networking sites (SNS) for work-related objectives, such as internal communication, information dissemination, or professional growth, workers are likely to see these standards favorably. Embracing this acceptance can result in heightened involvement with social networking service (SNS) technologies, which in turn can enhance performance results as employees conform their actions to meet business standards (Luqman *et al.*, 2018). The extent to which employees conform to subjective standards can impact their level of integration of social networking sites (SNS) into their everyday work routines. If employees experience significant social pressure to utilize social

networking sites (SNS) in certain manners, such as engaging in internal forums or exchanging project updates, they are likely to demonstrate greater adherence to these activities. By integrating this system, it is possible to optimize the team's overall performance through enhanced communication and cooperation (Polites *et al.*, 2018). Based on that, the research develops the following hypothesis:

H₂: There is a positive relationship between subjective norms and employee performance.

Ease of use

The level of user-friendliness of social networking sites is strongly correlated with employee performance. Platforms that are easy to use for users promote increased rates of acceptance, decrease the amount of time needed for training, minimize mistakes, and improve communication and cooperation. Organizations may enhance employee performance results and work satisfaction by offering user-friendly and easily understandable tools (Adzharuddin and Kander, 2018). The level of user-friendliness directly affects the efficiency with which employees can carry out activities utilizing SNS. If a social networking platform designed for project management has a user-friendly interface, employees may efficiently arrange assignments, collaborate with team members, and monitor progress. The use of this efficient approach leads to expedited work completion and enhanced overall performance (Lorenzo-Romero and Gomez- Borja, 2012). An uncomplicated and easily reachable social networking service diminishes the probability of user exasperation and mistakes. Complex or ambiguous systems might result in errors and reduced efficiency. By offering a user-friendly platform, employees are less prone to facing obstacles that might hinder their job, leading to improved accuracy and efficiency in their performance. The user-friendly nature of social networking platforms facilitates effective communication and cooperation among employees. Straightforward and precise tools enhance the clarity and effectiveness of interactions enabling team members to easily exchange information, offer comments, and collaborate effortlessly. This enhanced collaboration has the potential to result in superior project outcomes and elevated performance levels (Leng *et al.*, 2011). Based on that, the research develops the following hypothesis:

H₃: There is a positive relationship between ease of use and employee performance.

Intensity of use

There is a strong correlation between the extent to which social networking sites are used and employee performance, which can have both positive and bad consequences. Regular and intentional interaction can improve communication, teamwork, knowledge exchange, and job contentment. However, excessive or inadequately controlled usage can cause disruptions and affect the balance between work and personal life. It is crucial to effectively manage the usage of social networking sites (SNS) in order to optimize its advantages and sustain high levels of performance (Chen and Wei, 2020). Intensive utilization of the SNS, when employed with intention, may amplify employee engagement and productivity. Regular utilization of social networking sites (SNS) for work-related tasks, such as collaborating on projects, exchanging updates, or obtaining information, can optimize procedures and expedite decision-making. Employees that actively participate in these platforms may experience enhanced productivity and performance as they remain connected and well-informed (Charoensukmongkol, 2014). Excessive utilization of social networking sites (SNS) might result in enhanced communication and cooperation among employees. Consistent engagement on collaborative platforms may enhance connections, enhance coordination, and cultivate a cooperative work atmosphere. Based on that, the research develops the following hypothesis:

H₄: There is a positive relationship between intensity of use and employee performance.

Availability

There is a strong correlation between the presence of social networking sites and the performance of employees. It has the ability to increase access to resources, promote communication, offer flexible work arrangements, and provide real-time feedback and collaboration. Nevertheless, it is crucial to effectively control possible diversions and guarantee that the utilization of social networking sites (SNS) is in line with the objectives and efficiency of the company. Effective utilization and planned implementation of these technologies can optimize their advantages and have a good influence on employees (Moqbel *et al.*, 2013). The presence of social networking sites (SNS) can improve employees' capacity to get useful resources and information. Platforms that expedite access to industry news, professional networks, and organizational updates may bolster educated decision-making and problem-solving. Providing employees with convenient access to these materials can enhance their performance by enabling them to work more efficiently and make better-informed decisions (Ghorbanzadeh *et al.*, 2023). The presence of social networking services (SNS) tools for communication in the workplace can have a substantial influence on employee performance. Instant messaging, discussion boards, and video conferencing are tools that facilitate immediate engagement and cooperation. By having easy access to these technologies, employees may enhance their communication, streamline job coordination, and expedite issue resolution, resulting in enhanced productivity and performance (Huang and Liu, 2017). Based on that, the research develops the following hypothesis:

H₃: There is a positive relationship between availability and employee performance.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with mean and standard deviation has been computed and the results are presented in Table 2.

Table 2

Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 120 observations. The dependent variable is EP (Employee performance). The independent variables are U (Usefulness), SN (Subjective norms), EU (Ease of use), IU (Intensity of use), and A (Availability).

Variables	Mean	S.D.	EP	U	SN	EU	IU	A
EP	3.530	0.756	1					
U	3.862	0.682	0.384**	1				
SN	3.627	0.729	0.320**	0.371**	1			
EU	3.507	0.705	0.229**	0.354**	0.204**	1		
IU	3.714	0.844	0.397**	0.415**	0.326**	0.301**	1	
A	3.623	0.743	0.348**	0.416**	0.230**	0.278**	0.327**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 2 shows that usefulness is positively correlated to employee performance. It indicates that social networking sites' usefulness or quality contributes to an improvement in employee performance. Similarly, subjective norms is positively correlated to employee performance. It suggests that social norms or expectations that employees perceive from their managers, coworkers, or the organization as a whole typically have a favorable impact on employee performance. Likewise, ease of use has a positive relationship with employee performance. It indicates that employees usually do better when a

system, instrument, or procedure is simple to use. Further, intensity of use has a positive relationship with employee performance. It indicates that employees tend to perform better at work when they use specific tools, resources, or activities more intensely. In addition, availability is positively correlated to employee performance. It indicates that employee performance tends to improve along with the availability or use of social media platforms.

Regression analysis

Having analyzed the Kendall's Tau correlation coefficients matrix, the regression analysis has been carried out and the results are presented in Table 3. More specifically, it presents the regression results of usefulness, subjective norms, ease of use, intensity of use, and availability on employee performance.

Table 3

Estimated regression results of usefulness, subjective norms, ease of use, intensity of use, and availability on employee performance

The results are based on 120 observations using linear regression model. The model is $EP = \beta_0 + \beta_1 U + \beta_2 SN + \beta_3 EU + \beta_4 IU + \beta_5 A + \epsilon$, where the dependent variable is EP (Employee performance). The independent variables are U (Usefulness), SN (Subjective norms), EU (Ease of use), IU (Intensity of use), and A (Availability).

Model	Intercept	Regression coefficients of					Adj. R ²	SEE	F-value
		U	SN	EU	IU	A			
1	1.314 (3.837)**	0.574 (6.569)**					0.262	0.649	43.156
2	1.802 (5.724)**		0.476 (5.613)**				0.204	0.675	31.505
3	2.075 (6.369)**			0.415 (4.557)**			0.142	0.700	20.766
4	1.686 (6.446)**				0.496 (7.227)**		0.301	0.632	52.226
5	1.843 (5.980)**					0.466 (5.590)**	0.203	0.675	31.252
6	1.013 (2.847)**	0.420 (3.988)**	0.247 (2.509)*				0.293	0.636	25.693
7	0.890 (2.395)*	0.371 (3.261)**	0.223 (2.217)*	0.114 (1.130)			0.295	0.635	17.594
8	0.788 (2.220)*	0.231 (2.012)*	0.173 (1.790)	0.022 (0.222)	0.308 (3.613)**		0.361	0.604	17.830
9	0.672 (1.860)	0.178 (1.487)	0.165 (1.716)	0.005 (0.046)	0.280 (3.227)**	0.142 (1.506)	0.368	0.601	14.875

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Employee performance is the dependent variable.

Table 3 shows that the beta coefficients for usefulness are positive with employee performance. It indicates that usefulness has a positive impact on employee performance. This finding is similar to the findings of Magnier-Watanabe *et al.* (2010). Similarly, the beta coefficients for subjective norms are positive with employee performance. It indicates that subjective norms have positive impact on employee performance. This finding is consistent with the findings of Luqman *et al.* (2018). Likewise, the beta coefficients for ease of use are positive with employee performance. It indicates that ease of use has a positive impact on employee performance. This finding is similar to the findings of Adzharuddin and Kander (2018). In addition, the beta coefficients for intensity of use are positive with employee performance. It indicates that intensity of use has a positive impact on employee performance. This finding is consistent with the findings of Chen and Wei (2020). Further, the beta coefficients for

availability are positive with employee performance. It indicates that availability has a positive impact on employee performance. This finding is similar to the findings of Huang and Liu (2017).

4. Summary and conclusion

In this digital world, social networking sites are essential tools for businesses in many fields. They help build and maintain relationships with customers. With these platforms, businesses have a chance to connect with their audience, spread the word about their brand, and get useful feedback, all of which help the business grow and be successful. But because the business world is changing so quickly, it's important for companies to not only use social media to connect with customers, but also to train their employees to be flexible in the face of these changes. A company's general productivity, creativity, and efficiency depend on how well its employees do their jobs. These employees are often very busy on social networks. This activity can be both good and bad. It can improve teamwork, sharing of information, and employee involvement, but it also needs a well-thought-out plan to make sure that the exchanges are in line with the company's values and goals. As companies try to stay competitive, they need to make sure their employees know how to use social media to communicate with customers and with each other. This is important for both maintaining and improving the performance of the company.

This study attempts to analyze the impact of social networking sites on employee work performance: A case of Nepalese commercial banks. The study is based on primary data with 120 observations.

The major conclusion of this study is that usefulness, availability, intensity of use, subjective norms, and intensity of use have positive impact on employee performance. The availability of resources ensures that employees have what they need to perform their tasks, minimizing disruptions and improving productivity. Additionally, the intensity with which employees use these resources enhances their proficiency and output, while subjective norms, social pressures or expectations from peers and supervisors, motivate employees to meet performance standards. Together, these factors create a supportive and motivating environment, driving employees to perform at their best and contributing to overall organizational success. The study also concluded that the most significant element explaining changes in staff performance is usefulness, followed by intensity of use.

References

- Aboelmaged, M. G., 2018. Knowledge sharing through enterprise social network (ESN) systems: motivational drivers and their impact on employees' productivity. *Journal of Knowledge Management* 22(2), 362-383.
- Adzharuddin, N. A., and S. K. Kander, 2018. Social networking sites (SNS) and its influence on job performance at the workplace: The review of the literature. *International Journal of Academic Research in Business and Social Sciences* 8(6), 667-682.
- Akinbode, J. O., R. Opayemi, and E. Sokefun, 2013. Impact of online social networking on employees' commitment to duties in selected organizations in Lagos State, Nigeria. *International Journal of Business and Economic Development* 1(1), 94-100
- Alzaabi, Y. S. R., and S. M. A. Alshehhi, 2023. The negative effects of social media usage on employee performance-A conceptual analysis. *International Journal of Intellectual Human Resource Management (IJIHRM)* 4(02), 40-47.
- Ashraf, N., and T. Javed, 2014. Impact of social networking on employee performance. *Business Management and Strategy* 5(2), 139-150.
- Cao, X., X. Guo, D. Vogel, and X. Zhang, 2016. Exploring the influence of social media on employee work

- performance. *Internet Research* 26(2), 529-545.
- Cetinkaya, A. S., and M. Rashid, 2018. The effect of social media on employees' job performance: The mediating role of organizational structure. *Journal of Organizational Psychology* 18(4), 94-116.
- Charoensukmongkol, P., 2014. Effects of support and job demands on social media use and work outcomes. *Computers in Human Behavior* 36, 340-349.
- Chen, M., M. Babar, A. Ahmed, and M. Irfan, 2023. Analyzing the impact of enterprise social media on employees' competency through the mediating role of knowledge sharing. *Sustainability* 15(12), 9499.
- Chen, X., and S. Wei, 2020. The impact of social media use for communication and social exchange relationship on employee performance. *Journal of Knowledge Management* 24(6), 1289-1314.
- Choi, G., and H. Chung, 2013. Applying the technology acceptance model to social networking sites (SNS): Impact of subjective norm and social capital on the acceptance of SNS. *International Journal of Human-Computer Interaction* 29(10), 619-628.
- Doshi, P., and P. Nigam, 2024. Effect of social media on employee's work performance. *Journal of Organizational Effectiveness: People and Performance* 11(1), 50-68.
- Ghorbanzadeh, D., V. I. Khoruzhy, I. V. Safonova, and I. V. Morozov, 2023. Relationships between social media usage, social capital and job performance: the case of hotel employees in Iran. *Information Development* 39(1), 6-18.
- Huang, L. V., and P. L. Liu, 2017. Ties that work: Investigating the relationships among coworker connections, work-related Facebook utility, online social capital, and employee outcomes. *Computers in Human Behavior* 72, 512-524.
- Javed, A., M. Yasir, A. Majid, H. A. Shah, E. U. Islam, S. Asad, and M. W. Khan, 2019. Evaluating the effects of social networking sites addiction, task distraction, and self-management on nurses' performance. *Journal of Advanced Nursing* 75(11), 2820-2833.
- Kandiero, A., T. Perpetua, and D. N. Jagero, 2014. Impact of access to social media on employee productivity and organizational performance at Econet Wireless Zimbabwe. *International Journal of Knowledge and Research in Management and E-Commerce* 4(1), 25-32.
- Leng, G. S., S. Lada, M. Z. Muhammad, A. A. H. A. Ibrahim, and T. Amboala, 2011. An exploration of social networking sites (SNS) adoption in Malaysia using technology acceptance model (TAM), theory of planned behavior (TPB) and intrinsic motivation. *Journal of Internet Banking and Commerce* 16(2), 1-27.
- Lorenzo-Romero, C., and M. A. Gomez-Borja, 2012. Analysis of acceptance of social networking sites. *African Journal of Business Management* 6(29), 8609.
- Luqman, A., A. Masood, and A. Ali, 2018. An SDT and TPB-based integrated approach to explore the role of autonomous and controlled motivations in "SNS discontinuance intention". *Computers in Human Behavior* 85(2), 298-307.
- Magnier-Watanabe, R., M. Yoshida, and T. Watanabe, 2010. Social network productivity in the use of SNS. *Journal of Knowledge Management* 14(6), 910-927.
- Martensen, M., K. Börgmann, and M. Bick, 2011. The Impact of social networking sites on the employer-employee relationship. *Bled e-Conference e-Future* 12-15.
- Moqbel, M., and N. Kock, 2018. Unveiling the dark side of social networking sites: Personal and work-related consequences of social networking site addiction. *Information and Management* 55(1), 109-119.

- Moqbel, M., S. Nevo, and N. Kock, 2013. Organizational members' use of social networking sites and job performance: An exploratory study. *Information Technology and People* 26(3), 240-264.
- Moughal, W., S. M. Nordin, R. Salleh, and H. A. Abbasi, 2023. Social networking sites for success: A UTAUT-based investigation into university employee performance enhancement. *Business Management and Strategy* 14(2), 144-163.
- Polites, G. L., C. Serrano, J. B. Thatcher, and K. Matthews, 2018. Understanding social networking site (SNS) identity from a dual systems perspective: an investigation of the dark side of SNS use. *European Journal of Information Systems* 27(5), 600-621.
- Radhakrishnan, G. S. A. P., A. Basit, and Z. Hassan, 2018. The impact of social media usage on employee and organization performance: A study on social media tools used by an IT multinational in Malaysia. *Journal of Marketing and Consumer Behavior in Emerging Markets* 1(7), 48-65.
- Sapountzi, A., and K. E. Psannis, 2018. Social networking data analysis tools and challenges. *Future Generation Computer Systems* 86, 893-913.
- Shrestha, D., and S. R. Jeong, 2015. An exploratory study on the usage of internet technologies and tools in educational working environment of developing countries: A Case of Pokhara University in Nepal. *Journal of Internet Computing and Services* 16(4), 101-110.
- Shrestha, S. K., D. Basnet, and D. Dhungana, 2024. Navigating the digital landscape: Social media and employee privacy in Nepalese service sector. *Ganeshman Darpan* 9(1), 1-8.
- Thapa, P., M. R. Bhusal, F. P. Palladino, M. Shrestha, and N. Lamichhane, 2023. Influence of social media use on employees self-confidence among health service providers in selected health institutes. *Journal of Nobel Medical College* 12(2), 54-59.
- Wilson, J., 2009. Social networking: the business case. *Engineering and Technology* 10(4), 54-56.
- Yeshambel, T., M. Belete, and Y. Mulualem, 2016. Impact of online social networking on employees' productivity at work place in university of Gondar-A case study. *International Journal of Computer Applications* 135(3), 18-24.
- Yokoyama, M. H., 2016. How social network sites (SNS) have changed the employer-employee relationship and what are the next challenges for human resource (HR)? *REGE-Revista de Gestão* 23(1), 2-9.
- Zahmat Doost, E., and W. Zhang, 2024. The effect of social media use on job performance with moderating effects of Cyber loafing and job complexity. *Information Technology and People* 37(4), 1775-1801.

Part III:

Capital Structure

Chapter 10

Effect of leverage, assets growth, market capitalization and firm age on profitability of the Nepalese insurance companies

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Abstract

This study examines the effect of leverage, assets growth, market capitalization and firm age on the profitability of Nepalese insurance companies. Return on assets (ROA) and return on equity (ROE) are the dependent variables. The selected independent variables are debt to equity ratio, debt to assets ratio, long-term debt to assets ratio, assets growth, market capitalization and firm age. The study is based on secondary data of 10 insurance companies with 110 observations for the study period from 2012/13 to 2022/23. The data were collected from annual reports of the selected insurance companies and Nepal Insurance Authority. The correlation analysis and regression models are estimated to test the significance and effect of leverage, assets growth, market capitalization and firm age on the profitability of Nepalese insurance companies.

The study showed that debt to equity ratio has a negative impact on return on assets and return on equity. It indicates that an increase in debt to equity ratio leads to a decrease in return on assets and return on equity. Similarly, debt to assets ratio has a negative impact on return on assets and return on equity. It indicates that an increase in debt to assets ratio leads to a decrease in return on assets and return on equity. Likewise, firm age has a negative impact on return on assets and return on equity. It indicates that an increase in firm age leads to a decrease in return on assets and return on equity. Further, market capitalization has a negative impact on return on assets and return on equity. It indicates that an increase in market capitalization leads to a decrease in return on assets and return on equity. However, assets growth ratio has a positive impact on return on assets and return on equity. It indicates that an increase in assets growth leads to an increase in return on assets and return on equity. In contrast, long-term debt to assets ratio has a negative impact on return on assets and return on equity. It indicates that an increase in long-term debt to assets ratio leads to a decrease in return on assets and return on equity.

Keywords: debt to equity ratio, debt to assets ratio, market capitalization, firm age, assets growth, long-term debt to assets ratio, return on assets, return on equity

1. Introduction

Insurance companies play a crucial role in the financial stability and economic growth of a country. Insurance companies provide risk management services by offering coverage against potential financial losses, helping individuals, businesses, and the government safeguard their assets. Through the pooling of premiums, insurance companies create a safety net for policyholders, fostering confidence in both personal and business investments. Moreover, insurance companies serve as institutional investors, deploying collected premiums in long-term investment projects that contribute to economic development. By mitigating risks and enabling resource allocation, insurance companies strengthen financial resilience and promote sustainable economic growth. According to Haiss and Sumegi (2008), the insurance industry plays a significant role in the financial services sector by fostering economic growth, effective resource allocation, liquidity generation, the realization of economies of scale in investment, and the distribution of financial losses. Firms always have a target to increase their value, because the value of the firm is an attractive factor for investors. Management of the company believes and is confident that consistent profits attract and retain investors to invest in the company, which in turn will increase firm value (Fajaria and Isnalita, 2018).

Kartikasari and Merianti (2016) examined the effect of leverage and the size of a company on its profitability. The study used secondary data from financial statements of 100 manufacturing

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companies listed in IDX from 2009 until 2014. The study found that leverage ratio has a significant and positive impact on return on assets. Similarly, Al-Nawaiseh (2020) examined the effect of a firm's assets growth, size, and age on its profitability. The study showed an insignificant impact of the firm's assets growth on its profitability. Further, Dahmash *et al.* (2021) assessed the effect of a firm's size, asset growth, asset tangibility, and financial leverage on profitability. The result showed a significant positive impact of asset growth on profitability. Likewise, Hag and Firmansyah (2024) examined the impact of total asset turnover (TATO) and firm size on profit growth. The study revealed a positive impact of total asset turnover (TATO) and firm size on profit growth. Furthermore, asset growth strengthens the company's solvency, which can boost client confidence and market share. However, rapid asset growth without proper risk management can lead to inefficiencies and financial strain, potentially harming profitability. Thus, balanced asset growth is crucial for sustainable profitability. Investment returns positively and significantly influence Islamic life insurance asset growth (Sapitri *et al.*, 2024).

Oudat *et al.* (2020) analyzed the effect of bad debt, market capitalization, operation cost, capital adequacy, cash reserves on financial performance of commercial banks in Bahrain. The study showed that there is an insignificant relationship between market capitalization and profitability. Similarly, Sayari and Shamki (2016) examined the determinants of the commercial banks profitability in Jordan. The study found that market capitalization has a negative and significant impact on return on assets however, market capitalization has a significant and positive impact on return on equity. Likewise, Kotey (2024) analyzed the capital structure is one of the crucial decisions managers must make that can affect a firm's short-term and long-term value maximization prospects. The study showed that managers need to adopt more short-term debt financing rather than long-term financing as the former leads to more profits. Similarly, Sala-Rios (2024) examined the determinants of Spanish cooperatives' profitability. The study revealed that profitability is positively affected by size, liquidity, indebtedness, and regional specialization Further, Worku *et al.* (2024) assessed the determinants of profitability of insurance companies in Ethiopia: An evidence from insurance companies from 2011 to 2020 years. The study found that previous profit, age of the company, company size, managerial efficiency, leverage ratio, liquidity ratio, loss ratio, premium growth and inflation rate are significant key drivers of profitability of Ethiopian insurance companies.

Alarussi and Gao (2023) examined the determinants of profitability in Chinese companies. The study found that firm size, working capital and intangible assets have positive and significant relationships with profitability measured by return on assets and earnings per share. Positive working capital is important to lower the cost of capital and improve companies' profitability. Intangible assets are also an essential source to improve profitability due to their low costs. In addition, the findings concluded a negative and strong relationship between liquidity and profitability. Insurance firms to clearly communicate to shareholders about the tradeoff between high dividend payout rate and performance, so that shareholders willingly accept the low dividend rate, retaining profit as capital for future development of the insurance companies, the insurance companies should uncover ways of increasing their assets base. Insurance companies should therefore take into account the factors like country characteristic, development period, and on total assets (Mogire *et al.*, 2023). Ahmed *et al.* (2023) examined the effect of firm size on the association between capital structure and profitability. The study revealed members of the board, frequency of board meetings, board independence, and audit committee have positive influence on financial performance measured by return on assets and return on equity. Similarly, Arhinful and Radmehr (2023) investigated the impact of financial leverage on the financial performance of the firms listed on the Tokyo stock exchange. The study showed that interest coverage has a positive and statistically significant impact on both return on assets and return on equity. The study also stated that cash coverage has a positive and statistically significant impact on return on equity.

Akubu *et al.* (2017) investigated the relationship between capital structure and commercial banks profitability in Ghana. The study showed that there is a negative but significant relationship between commercial banks' profitability and all the capital structure measures (the ratios of short-term debt to total assets, long-term debt to total assets, and total debt to total assets). The study also found that total debt and banks' profitability are positively correlated, short-term debt and long-term debt are inversely related to banks' profitability. Likewise, Sasidharan *et al.* (2020) analyzed the firm-specific and macroeconomic factors that affect insurance company's financial performance. The study found that there is a negative relationship between leverage and financial performance measured by return on assets. Further, Tegegn *et al.* (2020) examined the effects of firm specific factors (age of companies, size of companies, leverage, premium growth rate liquidity ratio and tangibility of assets) on profitability. From the regression results; size, premium growth rate and liquidity and age are identified as most important determinant factors of profitability hence premium growth rate and size are positively related. However, the study revealed that leverage has a negative impact on profitability of the companies. In addition, Dhiab (2021) analyzed the determinants of profitability in the Saudi insurance sector. The study revealed that leverage has negative impact on profitability of Saudi insurance companies. Moreover, Siddik *et al.* (2022) examined the impact of insurers' financial insolvency on the profitability of insurance firms. The study revealed that inflation rate has a negative relationship with profitability of insurance companies.

Suyono *et al.* (2019) analyzed the influence of current ratio, debt to equity ratio, inventory turnover, total asset turnover, receivable turnover, and company size on profit growth in food and beverage companies. The study showed that current ratio, debt to equity ratio, inventory turnover, total asset turnover, receivable turnover and company size have no significant impact on profit growth. Likewise, Musah (2018) examined the impact of capital structure on profitability of commercial banks in Ghana. The result showed that age of the bank is positively associated with banks profitability. Further, Asiah *et al.* (2024) investigated the Effect of company size, profitability and company age on the timelessness of financial reporting. The study revealed that company size has a negative impact on profitability whereas age of the company has no impact on the timeliness of financial statements. In addition, Worku *et al.* (2024) assessed the determinants of profitability of insurance companies in Ethiopia: evidence from insurance companies from 2011 to 2020 years. The study showed that age of the company, size, managerial efficiency, leverage ratio, liquidity ratio, inflation and premium growth have statistically significant impact on profitability.

In the context of Nepal, Poudel (2019) examined the effect of ownership as well as various firm-specific factors that determine the profitability of insurance companies. The study showed a negative relation of tangibility and liquidity with return on asset however firm size, age and leverage have positive relation with return on assets. The financial dependability of an economy is greatly facilitated by the insurance sector. Profitability is a crucial measure of the financial health of Nepalese insurance firms. A wide range of elements influence the company's profitability. There may be both internal and external forces. Profitability is the main objective of the companies. Businesses cannot survive in the market for the long run without profitability. Evaluating past profitability, calculating current profitability and foretelling future profitability is very important for the company (Das *et al.*, 2015). Bhattarai (2020) investigated the factors affecting profitability of insurance companies in Nepal. The study revealed that leverage and size have significant with profitability. Similarly, Bhatt and Jain (2020) analyzed the relationship between the capital structure and the profitability of commercial Banks in Nepal. The study revealed that return on equity is insignificantly and positively related with long-term debt and deposits. The study also showed that there is an insignificant negative impact of short-term debt and total debt on profitability.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of leverage, assets growth, market capitalization and firm age on profitability of the insurance companies. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the effect of leverage, assets growth, market capitalization and firm age on profitability of the Nepalese insurance companies. Specifically, it examines the relationship of debt to equity ratio, debt to assets ratio, long-term debt to assets ratio, assets growth, market capitalization and firm age on profitability of the Nepalese insurance companies.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 10 Nepalese insurance companies from 2012/13 to 2022/23, leading to a total of 110 observations. The study employed convenience sampling method. The main sources of data include annual reports of Rastra Bema Sansthan, reports published by Ministry of Finance and annual reports of selected Nepalese insurance company. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of insurance companies selected for the study along with the study period and number of observations.

Table 1

List of insurance companies selected for the study along with study period and number of observations

S.N.	Name of the Insurance companies	Study period	Observation
1	Nepal Life Insurance Company Limited	2012/13 to 2022/23	11
2	IME General Insurance Company Limited	2012/13 to 2022/23	11
3	Neco Insurance Company Limited	2012/13 to 2022/23	11
4	Prime Life Insurance Company Limited	2012/13 to 2022/23	11
5	Himalayan General Insurance Company Limited	2012/13 to 2022/23	11
6	National Life Insurance Company Limited	2012/13 to 2022/23	11
7	Asian Life Insurance Company Limited	2012/13 to 2022/23	11
8	Nepal Insurance Corporation Limited	2012/13 to 2022/23	11
9	Prabhu Insurance Company Limited	2012/13 to 2022/23	11
10	NLG Insurance Company Limited	2012/13 to 2022/23	11
Total number of observation			110

Thus, the study is based on 110 observations.

The model

The model used in this study assumes that profitability of insurance companies depends upon leverage, assets growth, market capitalization and firm age. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are debt to equity ratio, debt to assets ratio, long-term debt to assets ratio, assets growth, market capitalization and firm age. Therefore, the models take the following forms:

$$ROA_{it} = \alpha + \beta_1 DE_{it} + \beta_2 DA_{it} + \beta_3 AG_{it} + \beta_4 MCA_{it} + \beta_5 LTDTA_{it} + \beta_6 FA_{it} + \epsilon_{it}$$

$$ROE_{it} = \alpha + \beta_1 DE_{it} + \beta_2 DA_{it} + \beta_3 AG_{it} + \beta_4 MCA_{it} + \beta_5 LTDTA_{it} + \beta_6 FA_{it} + \epsilon_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net profit after tax to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net profit after tax to total equity, in percentage.

DE = Debt to equity ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total equity, in percentage.

DA = Debt to assets ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total assets, in percentage.

AG = Assets growth as measured by the ratio of changing value of assets divided by beginning period of assets, in percentage.

MC = Market capitalization as measured by the product of number of outstanding shares and market price per share, Rs. in billion.

LTDTA = Long-term debt to total assets ratio as measured by the ratio of total long-term debt to the total asset, in percentage.

FA = Firm age as measured by the number of years from the firms incorporation date, in years.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Debt to equity ratio

There is a negative relationship between the debt-to-equity ratio and the profitability of insurance companies, indicating that as the proportion of debt relative to equity increases, profitability tends to decline (Suyono et al., 2019). This occurs because higher debt levels increase the financial obligations of the company in terms of interest payments, which reduces net income. Additionally, excessive reliance on debt can elevate financial risk, potentially leading to reduced investor confidence and higher costs of borrowing. Insurance companies with a high debt-to-equity ratio may also face challenges in maintaining operational stability during periods of financial stress, further impacting profitability. Consequently, maintaining a balanced capital structure with an optimal debt-to-equity ratio is crucial for enhancing the profitability and sustainability of insurance companies. Ahmad *et al.* (2012) found a negative correlation between profitability and the debt-to-equity ratio. Likewise, Singh and Singh (2016) found that the ratio of total debt to equity ratio has a negative influence on return on assets but a significant favorable impact on return on equity. Based on it, this study develops the following hypothesis:

H₁: There is a negative relationship between debt to equity ratio and profitability of insurance companies.

Debt to assets ratio

Tailab (2014) found that there is a negative relationship between the debt-to-assets ratio and the profitability of insurance companies, suggesting that as the proportion of debt relative to total assets increases, profitability tends to decrease. A higher debt-to-assets ratio indicates a greater reliance on borrowed funds to finance the company's operations and investments, leading to increased interest expenses that can erode net income. Moreover, excessive debt levels may restrict financial flexibility, reduce liquidity, and elevate the risk of insolvency, particularly during economic downturns. This can undermine operational efficiency and investor confidence, further impacting profitability. Therefore, maintaining a balanced debt-to-assets ratio is critical for ensuring financial stability and optimizing the profitability of insurance companies. Likewise, Hamid *et al.* (2015) showed that the ratio of debt

to assets and profitability are negatively correlated. Similarly, San and Heng (2011) found that ratio of debt to assets has a detrimental effect on profitability. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between debt to assets ratio and profitability of insurance companies.

Long-term debt to assets ratio

The long-term debt-to-total-assets ratio is a measurement representing the percentage of a corporation's assets financed with long-term debt, which encompasses loans or other debt obligations lasting more than one year. Hajisaaid (2020) found that in the Saudi Arabian context, the ratio of long-term debt to total assets and business profitability are negatively correlated. Moreover, Javed *et al.* (2019) showed that the long-term debt to assets ratio has a considerable but negative impact on profitability. Furthermore, Yegon *et al.* (2014) revealed that ratio of long-term debt to assets has a considerable but adverse effect on profitability. Likewise, Yapa (2015) found that ratio of long-term debt to assets has a considerable but negative impact on profitability. Based on it, this study develops the following hypothesis:

H₃: There is negative relationship between long-term debt to assets ratio and profitability of insurance companies.

Assets growth

As insurance companies expand their asset base, they can generate more investment income from their portfolios, which is a significant source of earnings in the industry (Dhiab, 2021). Additionally, asset growth reflects the ability to underwrite more policies, diversify investments, and enhance operational scale, all of which contribute to improved financial performance. A larger asset base also enables companies to better manage risks, fulfill regulatory requirements, and maintain liquidity, fostering stability and profitability. Therefore, sustained and strategic asset growth plays a vital role in enhancing the overall profitability of insurance companies. Glancey (1998) found that the company's growth and profitability are positively correlated. Similarly, Inyama *et al.* (2017) found that the profitability of Nigerian manufacturing companies are positively and significantly correlated with assets growth rate. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between assets growth and profitability of insurance companies.

Market capitalization

The total monetary value of all of a company's outstanding shares is known as market capitalization. Over the past few decades, the capital market has experienced tremendous growth, and an increasing number of businesses are using it to diversify their overall risk and secure new risk capital (Bulle, 2020). Yeboah *et al.* (2013) found that market capitalization has a positive correlation with profitability. Likewise, Oztop *et al.* (2018) showed a favorable correlation between profitability and market capitalization. Furthermore, Ani *et al.* (2012) found that market capitalization and bank profitability are positively and significantly correlated with each other. In addition, Kabajeh *et al.* (2012) revealed that market capitalization has a significant and positive impact on profitability. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between market capitalization and profitability of insurance companies.

Firm age

Satria and Lunardi (2023) found that firm age has a negative impact on profitability. There is a negative relationship between firm age and bank profitability, suggesting that as banks become older, their profitability tends to decline. Older banks may face challenges such as operational inefficiencies, legacy systems, and rigid organizational structures that hinder their ability to adapt to changing market conditions and technological advancements. Additionally, mature banks often operate in highly

saturated markets, which can limit growth opportunities and put downward pressure on profit margins (Tegegn *et al.*, 2020). Over time, older banks may also experience higher maintenance costs and reduced innovation, further impacting profitability. Consequently, while firm age can bring stability and trust, it may also present challenges that negatively affect the profitability of banks. Similarly, Kipasha (2013) showed that there is a negative impact of firm age on the profitability of microfinance. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between firm age and bank profitability.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2012/13 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 10 Nepalese insurance company for the study period of 2012/13 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit after tax to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net profit after tax to total equity, in percentage). The independent variables are DE (Debt to equity ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total equity, in percentage), DA (Debt to assets ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total assets, in percentage), LTDTA (Long-term debt to total assets ratio as measured by the ratio of total long-term debt to the total asset, in percentage), AG (Assets growth as measured by the ratio of changing value of assets divided by beginning period of assets, in percentage), MC (Market capitalization as measured by the product of number of outstanding shares and market price per share, Rs. in billion) and FA (Firm age as measured by the number of years from the firms incorporation date, in years).

Variables	Minimum	Maximum	Mean	S.D.
ROA	0.01	9.05	3.15	2.66
ROE	1.60	48.00	12.40	9.13
DE	0.51	14.52	3.71	3.64
DA	0.20	0.94	0.62	0.22
MC	0.32	2.95	1.62	0.65
AG	-0.07	0.99	0.20	0.23
LTDTA	1.00	96.00	43.30	29.90
FA	5.00	76.00	23.06	17.25

Source: SPSS

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 10 Nepalese insurance companies for the study period of 2012/13 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit after tax to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net profit after tax to total equity, in percentage). The independent variables are DE (Debt to equity ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total equity, in percentage), DA (Debt to assets ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total assets, in percentage), LTDTA (Long-term debt to total assets ratio as measured by the ratio of total long-term debt to the total asset, in percentage), AG (Assets growth as measured by the ratio of changing

value of assets divided by beginning period of assets, in percentage), MC (Market capitalization as measured by the product of number of outstanding shares and market price per share, Rs. in billion) and FA (Firm age as measured by the number of years from the firms incorporation date, in years).

Variables	ROA	ROE	DE	DA	MC	AG	FA	LTD-TA
ROA	1							
ROE	0.498**	1						
DE	-0.459**	-0.208*	1					
DA	-0.526**	-0.219*	0.804**	1				
MC	-0.129	-0.038	0.267**	0.228*	1			
AG	0.087	0.080	0.021	-0.044	0.124	1		
FA	-0.023	-0.138	-0.255**	-0.001	-0.002	-0.089	1	
LTD-TA	-0.333**	-0.130	0.657**	0.626**	0.476**	0.099	-0.024	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that there is a negative relationship between debt-to-equity ratio and return on assets. It indicates that higher the debt to equity ratio, lower would be return on assets. Similarly, debt to assets ratio has a negative relationship with return on assets. It indicates that higher the debt to assets ratio, lower would be the return on assets. Likewise, the study also showed that market capitalization has a negative relationship with return on assets. It indicates that increase in market capitalization lead to decrease in return on assets. However, the study shows that assets growth has a positive relationship with return on assets. It indicate that higher the assets growth, higher would be return on assets. In contrast, firm age has a negative relationship with return on assets. It indicates that higher the firm age, lower would be return on assets. Furthermore, long-term debt to assets ratio is negatively correlated to return on assets. It indicates that increases in long-term debt to assets ratio leads to decrease in return on assets.

On the other hand, there is a negative relationship between debt-to-equity ratio and return on equity. It indicates that higher the debt to equity ratio, lower would be return on equity. Similarly, debt to assets ratio has a negative relationship with return on equity. It indicates that higher the debt to assets ratio, lower would be the return on equity. Likewise, the study also showed that market capitalization has a negative relationship with return on equity. It indicates that increase in market capitalization lead to decrease in return on equity. However, the study shows that assets growth has a positive relationship with return on equity. It indicate that higher the assets growth, higher would be return on equity. In contrast, firm age has a negative relationship with return on equity. It indicates that higher the firm age, lower would be return on equity. Furthermore, long-term debt to assets ratio is negatively correlated to return on equity. It indicates that increases in long-term debt to assets ratio leads to decrease in return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of debt to equity ratio, debt to assets ratio, long-term debt to assets ratio, assets growth, market capitalization and firm age with return on assets of Nepalese insurance companies.

Table 4

Estimated regression results of debt to equity ratio, debt to assets ratio, long-term debt to assets

ratio, assets growth, market capitalization and firm age with return on assets

The results are based on panel data of 10 insurance companies with 110 observations for the period of 2012/13 to 2022/23 by using the linear regression model and the model is $ROA_{it} = \alpha + \beta_1 DE_{it} + \beta_2 DA_{it} + \beta_3 AG_{it} + \beta_4 MCA_{it} + \beta_5 LTDTA_{it} + \beta_6 FA_{it} + \epsilon_{it}$, where, the dependent variable is ROA (Return on assets as measured by the ratio of net profit after tax to total assets, in percentage). The independent variables are DE (Debt to equity ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total equity, in percentage), DA (Debt to assets ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total assets, in percentage), LTDTA (Long-term debt to total assets ratio as measured by the ratio of total long-term debt to the total assets, in percentage), AG (Assets growth as measured by the ratio of changing value of assets divided by beginning period of assets, in percentage), MC (Market capitalization as measured by the product of number of outstanding shares and market price per share, Rs. in billion) and FA (Firm age as measured by the number of years from the firms incorporation date, in years).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		DE	DA	MC	AG	FA	LTDTA			
1	4.407 (12.861)**	-0.056 (0.502)						0.203	2.389	25.898
2	4.407 (12.861)**		-6.468 (6.056)**					0.269	2.293	36.678
3	4.044 (5.505)**			-0.538 (1.291)				0.007	2.687	1.666
4	2.955 (8.175)**				1.018 (0.863)			0.003	2.678	0.744
5	3.216 (7.397)**					-0.003 (0.233)		0.009	2.680	0.054
6	4.408 (9.919)**						-0.300 (3.499)**	0.102	2.525	12.245
7	6.878 (7.696)**	-0.056 (0.502)	-6.468 (6.056)**					0.263	2.302	18.323
8	9.028 (7.580)**	-0.088 (0.758)	-9.026 (4.282)**	-0.313 (0.797)				0.332	2.186	16.742
9	8.905 (7.146)**	-0.082 (0.691)	-8.871 (4.101)**	-0.313 (0.797)	0.357 (0.355)			0.326	2.198	12.468
10	8.905 (7.146)**	9.246 (7.112)**	-8.025 (3.478)**	-0.276 (0.700)	0.334 (0.332)	-0.015 (1.049)		0.362	2.195	10.206
11	9.246 (7.112)**	9.246 (7.112)**	-8.577 (3.569)**	-0.417 (0.961)*	0.201 (0.196)	-0.017 (1.169)	-0.010 (0.812)	0.327	2.217	8.522

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (*) and (**) indicate that the results are significant at one and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for debt-to-equity ratio are negative with return on assets. It indicates that debt to equity ratio has a negative impact on return on assets. This finding is consistent with the findings of Ahmad *et al.* (2012). Similarly, the beta coefficients for debt to assets ratio are negative with return on assets. It indicates that debt to assets ratio has a negative impact on return on assets. This finding is similar to the findings of Tailab (2014). Likewise, the beta coefficients for market capitalization are negative with return on assets. It indicates that market capitalization has a negative impact on return on assets. This finding is not consistent with the findings of Yeboah *et al.* (2013). However, the beta coefficients for assets growth are positive with return on assets. It indicates that assets growth has a positive impact on return on assets. This finding is similar to the findings of Inyama *et al.* (2017). In contrast, the beta coefficients for firm age are negative with return on assets. It indicates that firm age has a negative impact on return on assets. This, finding is consistent with the findings of Satria and Lunardi (2023). Further, the beta coefficients for long-term debt to assets ratio are negative with return on assets. It indicates that long-term debt to assets ratio has a negative impact on return on assets. This finding is similar to the findings of Hajisaaid (2020).

Table 5 shows the regression results of debt to equity ratio, debt to assets ratio, long-term

debt to assets ratio, assets growth, market capitalization and firm age with return on equity of Nepalese insurance companies.

Table 5

Estimated regression results of debt to equity ratio, debt to assets ratio, long-term debt to assets ratio, assets growth, market capitalization and firm age with return on equity

The results are based on panel data of 10 insurance companies with 110 observations for the period of 2012/13 to 2022/23 by using the linear regression model and the model is $ROE_{it} = \alpha + \beta_1 DE_{it} + \beta_2 DA_{it} + \beta_3 AG_{it} + \beta_4 MCA_{it} + \beta_5 LTDTA_{it} + \beta_6 FA_{it} + \varepsilon_{it}$, where, the dependent variable is ROE (Return on equity as measured by the ratio of net profit after tax to total equity, in percentage). The independent variables are DE (Debt to equity ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total equity, in percentage), DA (Debt to assets ratio as measured by the ratio of sum of short-term debt plus long-term debt to the total assets, in percentage), LTDTA (Long-term debt to total assets ratio as measured by the ratio of total long-term debt to the total asset, in percentage), AG (Assets growth as measured by the ratio of changing value of assets divided by beginning period of assets, in percentage), MC (Market capitalization as measured by the product of number of outstanding shares and market price per share, Rs. in billion) and FA (Firm age as measured by the number of years from the firms incorporation date, in years).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		DE	DA	MC	AG	FA	LTDTA			
1	14.216 (11.033)**	-0.521 (2.109)*						0.034	8.992	4.448
2	17.926 (6.663)**		-9.080 (2.206)*					0.038	8.995	4.868
3	13.196 (2.234)*			-0.540 (0.376)				0.009	9.276	0.141
4	11.627 (9.355)**				3.216 (0.792)			0.004	9.211	0.628
5	13.964 (9.546)**					-0.072 (1.423)*		0.010	9.070	2.026
6	13.964 (9.546)**						-0.072 (1.423)*	0.007	9.114	1.684
7	16.799 (5.110)**	-0.251 (0.601)	-5.724 (0.824)					0.320	9.024	2.598
8	16.799 (5.110)**	-0.280 (0.064)	-5.724 (0.824)	-0.903 (0.571)				0.049	8.947	2.651
9	16.799 (5.110)**	0.159 (0.328)	-14.664 (1.655)	-1.128 (0.701)	3.216 (0.792)			0.048	8.998	2.193
10	22.665 (4.490)**	-0.246 (0.463)	-14.664 (1.655)	-1.421 (0.809)	3.216 (0.792)	-0.102 (3.746)**		0.690	8.899	2.403
11	24.035 (4.567)**	-0.359 (0.636)	-10.622 (1.092)	-1.421 (0.809)	0.956 (0.230)	-0.114 (1.881)	-0.034 (0.707)	0.690	8.974	2.152

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (*) and (**) indicate that the results are significant at one and five percent level respectively.
- Return on equity is the dependent variable.

Table 5 shows that the beta coefficients for debt-to-equity ratio are negative with return on equity. It indicates that debt to equity ratio has a negative impact on return on equity. This finding is similar to the findings of Singh and Singh (2016). Similarly, the beta coefficients for debt to assets ratio are negative with return on equity. It indicates that debt to assets ratio has a negative impact on return on equity. This finding is consistent with the findings of Hamid *et al.* (2015). Likewise, the beta coefficients for market capitalization are negative with return on equity. It indicates that market capitalization has a negative impact on return on equity. This finding is similar to the findings of Kabajeh *et al.* (2012). However, the beta coefficients for assets growth are positive with return on equity. It indicates that assets growth has a positive impact on return on equity. This finding is consistent with the findings of Glancey (1998). In contrast, the beta coefficients for firm age are negative with return on equity. It indicates that firm age has a negative impact on return on equity. This finding is similar to the

findings of Kipesha (2013). Further, the beta coefficients for long-term debt to assets ratio are negative with return on equity. It indicates that long-term debt to assets ratio has a negative impact on return on equity. This finding is consistent with the findings of Yapa (2015).

4. Summary and conclusion

Profitability is widely used to measure the performance of financial in situations all over the world. The insurance companies play a responsibility for maintain a financial responsibility to maintain a financial stability by provide a compensation of risk face by the company and provide a stable impact on the income of a company and also country. Insurance company provide the protection from risk to trade and company which ultimately contribute toward human progress. In current time, insurance interact between various actors in the financial system, banks, financial markets, long-term investment has been increasing. So, insurance company leads toward technology, economic and social progress of mankind. The goals of assessing profitability are to determine and track the progress of profit from year to year as well as to review and compare the profitability of funds held by the insurance company. Profitability is also used to quantify earnings over a specific time period. Applying these rules will achieve rational management and governance.

This study attempts to analyze the effect of leverage, assets growth, market capitalization and firm age on profitability of the Nepalese insurance companies. The study is based on secondary data of 10 Nepalese insurance companies with 110 observations for the period from 2015/16 to 2021/22.

The major conclusion of this study is that debt to equity ratio, debt to assets ratio, market capitalization, firm age and long-term debt to assets ratio have negative impact on return on assets and return on equity. It indicates that increase in debt to equity ratio, debt to assets ratio, market capitalization, firm age and long-term debt to assets ratio leads to decrease in return on assets and return on equity. However, assets growth has a positive impact on return on assets and return on equity. It indicates that increase in assets growth leads to increase in return on assets and return on equity. Likewise, the study also concluded that debt to assets ratio followed by debt to equity ratio is the most influencing factor that explains the changes in the return on asset and return on equity in the context of Nepalese insurance companies.

References

- Ahmad, Z., N. M. Abdullah, and S. Roslan, 2012. Capital structure effect on firm's performance: Focusing on consumers and industrial sectors on Malaysian firms. *International Review of Business Research Papers* 8(5), 137-155.
- Ahmed, A. M., N. A. Sharif, M. N. Ali, and I. Hagen, 2023. Effect of firm size on the association between capital structure and profitability. *Sustainability* 15(14), 1-17.
- Akubu, I. N., M. M. Alhassan, A. A. Mikhail, and A. N. I. Alhassan, 2017. Commercial banks profitability in Ghana: Does capital structure matter. *International Journal of Accounting and Financial Reporting* 7(1), 333-342.
- Alarussi, A. S., and X. Gao, 2023. Determinants of profitability in Chinese companies. *International Journal of Emerging Markets* 18(10), 4232-4251.
- Al-Nawaiseh, M. A., 2020. The effect of firm's age, size and growth on its profitability: Evidence from Jordan. *European Journal of Business and Management* 12(5), 88-93.
- Ani, W. U., D. O. Ugwunta, I. J. Ezeudu, and G. O. Ugwuanyi, 2012. An empirical assessment of the determinants of bank profitability in Nigeria: Bank characteristics panel evidence. *Journal of Accounting and Taxation* 4(3), 38-43.
- Arhinful, R., and M. Radmehr, 2023. The impact of financial leverage on the financial performance of the firms

- listed on the Tokyo stock exchange. *SAGE Open* 13(4), 1-22.
- Asiah, N., M. Sapruwan, & L. A. Irwanti, 2024. The Effect of company size, profitability and company age on the timelessness of financial reporting. *International Journal of Asian Business and Management* 3(2), 121-130.
- Bhatt, S., and S. Jain, 2020. Capital structure and profitability of commercial banks in Nepal. *Account and Financial Management Journal* 5(5), 2166-2173.
- Bhattarai, P., 2020. English language teachers' experience on online teaching amidst COVID-19. In *Linguistic Forum-A Journal of Linguistics* 2(3), 20-25.
- Bulle, N., 2020. Trios versions de l'individualisme méthodologique à l'aune de l'épistémologie 1. *L'Année Sociologique* 70(1), 97-128.
- Dahmash, F., W. A. Salamat, W. M. Masadeh, and H. Alshurafat, 2021. The effect of a firm's internal factors on its profitability: Evidence from Jordan. *Journal Investment Management and Financial Innovations* 18(2), 130-143.
- Das, B. C., M. M. Chowdhury, M. H. Rahman, and N. K. Dey, 2015. Leverage and profitability analysis of private commercial banks in Bangladesh. *International Journal of Economics, Commerce and Management* 3(1), 1-34.
- Dhiab, L. B., 2021. Determinants of insurance firms' profitability: an empirical study of Saudi insurance market. *Journal of Asian Finance, Economics and Business* 8(6), 0235-0243.
- Fajaria, A. Z., and N. I. D. N. Isnailita, 2018. The effect of profitability, liquidity, leverage and firm growth of firm value with its dividend policy as a moderating variable. *International Journal of Managerial Studies and Research (IJMSR)* 6(10), 55-69.
- Glancey, K., 1998. Determinants of growth and profitability in small entrepreneurial firms. *International journal of Entrepreneurial Behavior and Research* 4(1), 18-27.
- Hag, A. D. A., and D. Firmansyah, 2024. Profit growth: the impact of total asset turnover and firm size. *Jurnal Ekonomi, Manajemen Dan Akuntansi* 2(04), 531-544.
- Haiss, P. R., and K. Sumegi, 2008. The relationship of insurance and economic growth: A theoretical and empirical analysis. *Journal of Applied Economics and Economic Policy* 35(4), 405-431.
- Hajisaaid, A. M. S. A., 2020. The effect of capital structure on profitability of basic materials Saudi Arabia firms. *Journal of Mathematical Finance* 10(4), 631-647.
- Hamid, S., J. Waycott, S. Kurnia, and S. Chang, 2015. Understanding students' perceptions of the benefits of online social networking use for teaching and learning. *The Internet and Higher Education* 26(7), 1-9.
- Inyama, O. I., R. Oluchukwu, and C. V. Nnenna, 2017. Evaluation the relationship between assets growth rate and financial performance of manufacturing firms in Nigeria. *International Journal of Managerial Studies and Research* 5(10), 63-73
- Javed, T., W. Younas, and M. Imran, 2019. Impact of capital structure on firm performance: Evidence from Pakistani firms. *International Journal of Academic Research in Economics and Management Sciences* 3(5), 28-52.
- Kabajeh, M., K. Mukhled, and F. Dahmash, 2012. The relationship between the ROA, ROE and ROI ratios with Jordanian insurance public companies market share prices. *Journal of Financial Economics* 48(4), 135-145.
- Kartikasari, D., and M. Merianti, 2016. The effect of leverage and firm size to profitability of public manufacturing companies in Indonesia. *International Journal of Economics and Financial Issues* 6(2), 409-413.
- Kipasha, E. F., 2013. Impact of size and age on firm performance: Evidences from Microfinance Institutions in Tanzania. *Research Journal of Finance and Accounting* 4(5), 105-116.

- Kotey, R. A., 2024. Does capital structure affect profitability of listed Ghanaian firms? *The Journal of Developing Areas* 58(2), 161-177.
- Kotey, R. A., 2024. Does Capital Structure Affect Profitability of Listed Ghanaian Firms? *The Journal of Developing Areas* 58(2), 161-177.
- Mogire, O. G., J. Bosire, and R. Ngali, 2023. Firm characteristics and dividend payout of insurance companies in Kenya. *International Academic Journal of Economics and Finance* 3(10), 134-178.
- Musah, A., 2018. The impact of capital structure on profitability of commercial banks in Ghana. *Asian Journal of Economic Modelling* 6(1), 21-36.
- Oudat, M. S., and J. A. A. Basel, 2020. Effect of bad debt, market capitalization, operation cost, capital adequacy, cash reserves on financial performance of commercial banks in Bahrain. *International Journal of Psychosocial Rehabilitation* 24(1), 5982-5985.
- Oztop, A. O., F. Samiloglu, and A. I. Akgun, 2018. The impact of market capitalization on profitability: Evidence from Turkish informatics and technology firms. *International Journal of Economics and Financial Issues* 8(4), 105-112.
- Poudel, D. P., 2019. Migration, forest management and traditional institutions: Acceptance of and resistance to community forestry models in Nepal. *Geoforum* 106(11), 275-286.
- Sala-Rios, M., 2024. What are the determinants affecting cooperatives' profitability? Evidence from Spain. *Annals of Public and Cooperative Economics* 95(1), 85-111.
- San, O. T., and T. B. Heng, 2011. Capital structure and corporate performance of Malaysian construction sector. *International Journal of Humanities and Social Science* 1(1), 28-36.
- Sapitri, N. A., H. Hasbi, N. Nurhikma, and L. F. Z. Sari, 2024. The influence of investment returns and Tabarru fund contributions on the asset growth of registered sharia life insurance companies. *International Journal of Engineering Business and Social Science* 2(5), 1284-1296.
- Sasidharan, S., D. H. Singh, S. Vijay, and B. Manalikuzhiyil, 2020. COVID-19: Pan (info) demic. *Turkish Journal of Anesthesiology and Reanimation* 48(6), 438-443.
- Satria, F., and A. Lunardi, 2023. The effect of sales growth, profitability and firm age toward tax avoidance on consumer goods companies listed on the Indonesia Stock Exchange. *International Journal of Social, Policy and Law* 4(1), 41-49.
- Sayari, K., and D. Shamki, 2016. Commercial banks profitability and stock market developments. *Journal of Applied Finance and Banking* 6(4), 43-52.
- Siddik, M. N. A., M. E. Hosen, M. F. Miah, S. Kabiraj, S. Joghee, and S. Ramakrishnan, 2022. Impacts of insurers' financial insolvency on non-life insurance companies' profitability: evidence from Bangladesh. *International journal of Financial Studies* 10(3), 1-15.
- Singh, B., and M. Singh, 2016. Impact of capital structure on firm's profitability: a study of selected listed cement companies in India. *Pacific Business Review International* 8(1), 46-54.
- Suyono, S., Y. Yusrizal, & S. Solekhatun, 2019. Analisis pengaruh current ratio, total debt to equity ratio, inventory turnover, total asset turnover, receivable turnover dan size perusahaan terhadap pertumbuhan laba pada perusahaan food and beverage yang terdaftar di bursa efek indonesia periode 2013. *Bilancia: Jurnal Ilmiah Akuntansi* 3(4), 389-405.
- Tailab, M., 2014. The effect of capital structure on profitability of energy American firms. *International Journal of Business and Management Invention* 3(12), 54-61.
- Tegegn, M., L. Sera, and T. M. Merra, 2020. Factors affecting profitability of insurance companies in Ethiopia:

panel evidence. *International Journal of Commerce and Finance* 6(1), 1-14.

Worku, A. T., Y. W. Bayleyegne, & Z. B. Tafere, 2024. Determinants of profitability of insurance companies in Ethiopia: evidence from insurance companies from 2011 to 2020 years. *Journal of Innovation and Entrepreneurship* 13(1), 4-11.

Worku, A. T., Y. W. Bayleyegne, and Z. B. Tafere, 2024. Determinants of profitability of insurance companies in Ethiopia: An evidence from insurance companies from 2011 to 2020 years. *Journal of Innovation and Entrepreneurship* 13(1), 1-19.

Yapa, A. D., 2015. Capital structure and profitability: An empirical analysis of SMEs in the UK. *Journal of Emerging Issues in Economics, Finance and Banking* 4(2), 1661-1675.

Yeboah, E., and D. Shaw, 2013. Customary land tenure practices in Ghana: examining the relationship with land-use planning delivery. *International Development Planning Review* 35(1), 21-39.

Yegon, C., J. Cheruiyot, J. Sang, P. K. Cheruiyot, J. Kirui, and J. Rotich, 2014. Effects of dividend policy on firm's financial performance: Econometric analysis of listed manufacturing firms in Kenya. *Research Journal of Finance and Accounting* 5(12), 136-144.

Chapter 11

Impact of capital structure on firm value in Nepalese insurance companies

- Buddhi Raj Tamang*

Abstract

This study examines the impact of capital structure on firm value of Nepalese insurance companies. Market capitalization and book value per share are the selected dependent variables. The selected independent variables are long term debt, short term debt ratio, total debt ratio, debt to equity ratio, firm size and liquidity. The study is based on secondary data of 9 insurance companies with 108 observations for the study period from 2011/12 to 2022/23. The data were collected from annual report and audited financial statement of the selected insurance companies. The correlation coefficients and regression models are estimated to test the significance and importance of capital structure on firm value of Nepalese insurance companies.

The results showed that short term debt ratio has a positive effect on market capitalization and book value per share. It indicates that increase in short-term debt ratio leads to increase in market capitalization and book value per share. Likewise, total debt ratio has a positive effect on market capitalization and book value per share. It indicates that increase in total debt ratio leads to increase in market capitalization and book value per share. Moreover, long-term debt has a negative effect on market capitalization. It indicates that increase in long-term debt leads to decrease in market capitalization. Similarly, firm size has a positive effect on market capitalization. It indicates that larger the firm size, higher would be the market capitalization. On the other hand, debt to equity ratio has a negative effect on book value per share. It indicates that higher the debt-to-equity ratio, lower would be the book value per share. In addition, liquidity ratio has a negative effect on book value per share. It indicates that increase in liquidity ratio leads to decrease in book value per share.

Keywords: market capitalization, book value per share, long term debt, short term debt ratio, total debt ratio, debt to equity ratio, firm size, liquidity

1. Introduction

Capital structure is a key determinant of firm value, as it influences the cost of capital, risk profile, and financial flexibility. By balancing debt and equity, a firm can optimize its weighted average cost of capital, take advantage of tax shields, enhance returns to shareholders, and signal financial strength to the market. Ultimately, the right capital structure enables a firm to maximize its value, making it a critical aspect of corporate finance strategy. A sound capital structure enables a firm to access different capital markets more effectively. With an optimal balance of debt and equity, a firm can attract both lenders and equity investors, ensuring it has the resources needed for growth and expansion. The right mix of debt and equity allows a firm to finance its expansion plans efficiently. Debt can be used to fund growth opportunities, such as mergers and acquisitions, while equity can provide the necessary capital without increasing financial risk excessively. A firm's capital structure describes how it raised the capital required to start and grow its business activities. It is a combination of various types of equity and debt capital that a firm maintains as a result of its financing decisions (Niu, 2008). Habib *et al.* (2016) found the trade-off theory that deals with the idea of choosing capital structure, i.e., what proportion of debt and equity should a company choose. There are four different theories about capital structure which reflect the influence of debt on corporate profitability, namely: Pecking order theory, the agency costs theory, tradeoff theory, and signaling theory. Watson and Head (2007) stated that the capital structure signifies the proportion of liabilities relative to the equity portion adopted by the business. Various financial indicators, such as debt/equity ratio, long-term debt/equity ratio, long-term debt ratio to total capital employed, and current and long-term debt ratio/equity, serve

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as measures to assess the capital structure within the enterprise. Capital structure, which refers to the mix of debt and equity that a firm uses to finance its operations and growth, plays a crucial role in enhancing firm value. The decisions surrounding capital structure can significantly impact a firm's cost of capital, risk profile, and ultimately its market value.

Capital structure referred to as finance leverage or financial structure, encompasses various terms and is commonly known as capital structure or financial leverage. It signifies the proportion of debt and equity utilized to fund a business's asset formation. The level of debt employed has a significant impact on managerial behavior and financial decision making. Financial ratios, including the debt/equity ratio (long-term debt/equity or long-term debt/total capital employed), provide a means to gauge the capital structure within a company. Moreover, the authors contend that the capital structure ratio can include both short-term and long-term debt, particularly when a business has an extended overdraft (Bui and Pham, 2023). Components of capital structure are equity capital, debt capital, and hybrid capital. Pecking order theory stated that firms prefer using internal sources of financing first, and then debt and finally external equity obtained through shares (Miller, 1977). Agency costs arise as a result of the relationships between shareholders and managers, and those between debt-holders and shareholders. According to the agency costs theory; there are both positive as well as negative effects of debt on profitability (Jensen and Meckling, 1976). Signaling theory stated that, the debt; in the presence of asymmetric information, should be correlated positively to profitability. Estimating and quantifying the cost of debt and equity capital is one of the most perplexing questions in finance literature that deals with the optimal debt-equity combination. Over the last few decades, capital structure has sparked considerable discussion and scholarly interest across industries in corporate finance literature. Nonetheless, the area has garnered little study attention inside the banking industry.

Capital structure is the way a firm finance it is assets across the blend of debt, equity, or hybrid securities (Saad, 2010). Because capital structure decisions affect a firm's value, firms prefer to have a capital structure that optimizes value. The goal of a corporation should be to maximize its value through capital structure decisions. However, there are so many competing ideas about the relationship between capital structure and company value that it is important to categorize them into several broad divisions. A company's capital structure is the amalgamation of debt and equity which is maintained by the organization. When looking for external capital to finance projects, businesses must decide on the sort of securities to issue and the right capital structure. The relationship between capital structure and firm value has been much debated, both theoretically and empirically. Debates in the literature have centered on whether there is an optimum capital structure for an individual firm, or whether the fraction or degree of debt usage is irrelevant or relevant to the firm's value (Hatfield *et al.*, 1994). Cost of capital decision is the vital one since the profitability of an enterprise is directly affected by such decision. Hence, proper care and attention need to be given while determining capital structure decision (Niresh, 2012). Components of capital structure are equity capital, debt capital, and hybrid capital.

High levels of debt increase the firm's fixed obligations, making it more vulnerable to economic downturns or poor business performance. This could lead to financial distress or even bankruptcy, which would severely harm market performance. As debt levels rise, lenders may demand higher interest rates due to the increased risk, which can erode the benefits of the debt and increase the firm's cost of capital. High debt levels limit the firm's ability to raise additional funds in the future, either through debt or equity. This reduced financial flexibility can be a significant drawback, especially in times of need. Stulz (1990) revealed that debt can have both positive and negative effect on firm value. Similarly, Aggarwal and Kyaw (2006) stated that debt can have both positive and negative effects on the value of the firm. Likewise, McConnel and Servas (1995) analyzed that the relationship between corporate values, leverage and equity ownership of U.S. firms. The study stated that for firms with high P/E ratios or for high-growth firms, value is negatively related to leverage and that in firms with low

P/E ratio or low-growth firms, value is positively related to leverage.

Afinindy et al. (2012) also examined the capital structure relationship with and performance of the firm. The study showed that firm value has a significant but negative correlation with capital structure. Likewise, Manu et al. (2019) found that capital structure has a positive and significant effect on firm's value. Al-Najjar and Al-Najjar (2017) revealed that positive relationship between external financing and firm's value. Kontesa (2015) stated that there is a positive effect of capital structure on firm's value. Likewise, Soumadi and Hayajneh (2015) found that capital structure associated negatively and statistically with firm's value. Similarly, Agrawal and Knoeber (1996) explored that there is a negative association between leverage and firm's value. Likewise, Aggarwal and Pradhan (2017) stated that capital structure has a significant positive impact on firm value so that the optimal capital structure can increase firm value. The implication is that the optimal capital structure is a comparison of the use of funds from equity and debt. Similarly, Hirdinis (2019) stated that capital structure has a positive impact on firm value.

In the context of Nepal, Bhattarai (2020) examined the effects of capital structure on financial performance of insurance companies in Nepal. The result concluded that equity to total assets, leverage, and assets tangibility have significant effects on the financial performance in Nepalese insurance companies' cases. Likewise, Jaishi (2020) assessed that the relationship between capital structure and the financial performance of Nepalese insurance companies. The study showed that insurance companies having a high debt ratio have better financial performance. An increase in debt ratio and tangibility increase return on assets and an increase in equity, size and liquidity decrease return on assets in the industry. The impact of the debt ratio and tangibility on earning per share is positive and there is the negative impact of equity, size and liquid ratio on earning per share. Similarly, Pradhan and Pokharel (2016) investigated the impact and significance of financial leverage on the performance of commercial banks. The study revealed that financial leverage has negative impact on firm performance. Maharjan (2017) found that long term debt to equity ratio, total debt to equity ratio, bank size, and liquidity position is negatively related to firm performance. Similarly, Pradhan and Shrestha (2015) found that long term debt to total assets, total debt to total assets, debt to equity ratio, and interest coverage ratio are the major variables with a significant impact on Nepalese banks' profitability.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of impact of capital structure on the value of insurance companies. Though there are above-mentioned empirical evidence in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The main purpose of the study is to analyze the impact of capital structure on firm value in the context of Nepalese insurance companies. Specifically, it examines the relationship of long term debt ratio, short term debt ratio, total debt ratio, debt to equity ratio, firm size and liquidity with market capitalization and book value per share in the context of Nepalese insurance companies.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results and the final sections draws conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 9 Nepalese insurance companies from 2011/12 to 2022/23, leading to a total of 108 observations. The main sources of data collected from the annual report and audited financial statement of the selected insurance companies. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list

of insurance companies selected for the study along with the study period and number of observations.

S.N.	Name of insurance companies	Study period	Observations
1	Asian Life Insurance Company Limited	2011/12 to 2022/23	12
2	Life Insurance Corporation Limited	2011/12 to 2022/23	12
3	Metlife Insurance Company Limited	2011/12 to 2022/23	12
4	National Life Insurance Company Limited	2011/12 to 2022/23	12
5	Neco Insurance Limited	2011/12 to 2022/23	12
6	Nepal Insurance Company Limited	2011/12 to 2022/23	12
7	NLG Insurance Company Limited	2011/12 to 2022/23	12
8	Prabhu Insurance Limited	2011/12 to 2022/23	12
9	Shikhar Insurance Company Limited	2011/12 to 2022/23	12
Total number of observations			108

Thus, the study is based on the 108 observations.

The model

The model used in this study assumes that firm value depends on capital structure. The dependent variables selected for the study are market capitalization and book value per share. Similarly, the selected independent variables in this study are long term debt ratio, short term debt ratio, total debt ratio, debt to equity ratio, firm size and liquidity. Therefore, the models take the following forms:

$$MCAP = \beta_0 + \beta_1 LDR + \beta_2 FSIZE + \beta_3 LIQ + \beta_4 SDR + \beta_5 TDR + \beta_6 DER + e$$

$$BVPS = \beta_0 + \beta_1 LDR + \beta_2 FSIZE + \beta_3 LIQ + \beta_4 SDR + \beta_5 TDR + \beta_6 DER + e$$

Where,

MCAP = Market capitalization as measured by the number of outstanding shares and current market price, Rs. in billions.

BVPS = Book value per share as measured by the total equity to number of shares, in Rs.

LDR = Long term debt ratio as measured by the ratio of long term debt to total assets, in times.

SDR = Short term debt ratio as measured by the ratio of short term debt to total assets, in times.

TDR = Total debt ratio as measured by the ratio of total debt to total assets, in times

DER = Debt to equity ratio as measured by the total debt to shareholder equity, in times.

LIQ = Liquidity as measured by the current ratio, in times.

FSIZE = Firm size as measured by the number of branches of the insurance company, in numbers.

The following section describes the independent variables used in this study along with hypothesis formulation.

Long term debt ratio

Long-term debt consists of loans and financial obligations lasting over one year. A company takes on long-term debt in order to acquire immediate capital. Ahmad *et al.* (2020) found that ratio of long-term debt to total assets, total debt to total assets and total debt to total equity have positive effect on firm value. Likewise, Etim *et al.* (2022) stated that debt ratio and long-term debt have positive and

significant influence on the firm value of listed consumer goods firms in Nigeria. Likewise, Jones and Edwin (2019) showed that total debt, long-term debt and short-term debt to asset ratio positively influenced the performance of consumer goods firms in Nigeria. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between long term debt ratio and firm value.

Short term debt ratio

Short-term debt to assets ratio shows how much of the enterprise's total assets are financed using loans and financial debts lasting for one year or less. Abor (2007) investigated the debt policy and performance of SMEs of Ghanaian and South African firms. The study found that short-term debt to assets ratio has negative and statistically significant impact on firm value. In addition, Chaleeda *et al.* (2019) investigated the impact of capital structure on firm performance of Malaysian firms. The study revealed that the short-term debt to assets ratio has a negative impact on firm value. In addition, Ha (2017) assessed the impact of capital structure and cash holdings on firm value in companies listed on the Ha Chi minh stock exchange. The study concluded that the impact of short-term debt on firm value is negative and insignificant. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between short-term debt ratio and firm value.

Total debt ratio

A ratio that measures the extent of a company's or consumer's leverage and the debt ratio is defined as the ratio of long-term and short-term debt to total assets. Ahmad *et al.* (2020) showed that financial leverage measured by short term debt to total assets and total debt to total assets has a significantly negative relationship with the firm performance measured by return on assets. Likewise, Akhtar *et al.* (2016) found that the total debt ratio positively influences book value per share in manufacturing companies. In addition, Akhmadi and Robiyanto (2020) found that debt ratio has positive effect on firm value. Similarly, Lin and Chang (2011) revealed that total debt ratio has positive impact on value of company. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between total debt ratio and firm value.

Debt to equity ratio

Debt to equity ratio is a debt ratio used to measure a company's financial leverage, calculated by dividing a company's total liabilities by its equity. Lubatkin and Chatterjee (1994) argued that increasing the debt-to-equity ratio will help firms ensure that managers are running the business more efficiently a high debt to equity ratio means the company is funding most of its ventures with debt. In addition, Annisa and Chabachib (2017) revealed that debt to equity ratio has a significant positive effect on firm value. Likewise, Pertiwi and Hermanto (2017) showed that debt policy debt to equity ratio has a positive effect on firm value. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between debt-to-equity ratio and firm value.

Liquidity ratio

Liquidity is the ability of company to meet its short-term obligations. The higher the liquidity of a company the better is company able to pay the debt interests. A company with high liquidity can rely on debt as a great contributor to capital structure because it can easily pay that debt (Fama and French, 2012). Sari and Sedana (2020) revealed that liquidity has a positive and significant effect to the value of the company. Likewise, Jihadi *et al.* (2021) found that liquidity has a positive and significant effect on firm value. In addition, Putri and Wiksuna (2021) stated that profitability and liquidity have

a positive significant effect on firm value. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between liquidity ratio and firm value.

Firm size

Ali and Yadav (2011) revealed that the costs of issuing debt or equity are also related to firm size. Small firms have to pay much more than large firm to issue new equity or debt. Similarly, Lumapow *et al.* (2017) revealed that the firm size has a positive and significant impact on firm value. Likewise, Setiadharm and Machali (2017) found that there is no indirect effect of firm size on the firm value with capital structure as intervening variable. Similarly, Sondakh (2019) stated that the liquidity and firm size partially influence positively and significantly on firm value. Likewise, Nurwulandari (2021) revealed that profitability and firm size directly have a positive and not significant impact on firm value. In addition, Ayuba and Abdulwahab (2019) stated that firm size has positive significant effect on firm value. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between firm size and firm value.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2011/12 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 9 insurance companies in Nepal for the study period from 2011/12 to 2022/23. The dependent variables are MCAP (Market capitalization as measured by the number of outstanding shares and current market price, Rs. in billions), and BVPS (Book value per share as measured by the ratio of total shareholder equity to total number of outstanding shares, in Rs.). The independent variables are LTD (Long term debt ratio, in times), STD (Short term debt ratio, in times), TDR (Total debt ratio, in times), DTE (Debt to equity ratio, in times), LIQR (Liquidity ratio, in times) and FSIZE (Firm size, in number).

Variables	Minimum	Maximum	Mean	Std. Deviation
MCAP	0	51.78	9.64	11.27
BVPS	117	314	187.02	38.17
LTD	0	0.02	0.01	0.09
STD	0.02	1.76	0.55	0.39
TDR	0.02	1.76	0.56	0.39
DER	0.06	20.42	3.83	4.77
LIQR	0.24	16.68	2.33	2.56
SIZE	11	151	56.97	37.87

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 9 Nepalese insurance

companies for the study period from 2011/12 to 2022/23. The dependent variables are MCAP (Market capitalization as measured by the number of outstanding shares and current market price, Rs. in billions), and BVPS (Book value per share as measured by the ratio of total shareholder equity to total number of outstanding shares, in Rs.). The independent variables are LTD (Long term debt ratio, in times), STD (Short term debt ratio, in times), TDR (Total debt ratio, in times), DTE (Debt to equity ratio, in times), LIQR (Liquidity ratio, in times) and FSIZE (Firm size, in number).

Variables	MC	BVPS	LTD	STD	TDR	DER	LIQR	SIZE
MCAP	1							
BVPS	-0.270**	1						
LTD	-0.108	0.902**	1					
STD	0.046	0.186	-0.881**	1				
TDR	0.048	0.189	-0.868**	1.00**	1			
DER	0.651**	-0.365**	-0.918**	0.414**	0.414**	1		
LIQR	0.238*	-0.173	-0.236	-0.128	-0.129	0.132	1	
SIZE	0.499**	-0.308**	0.918**	-0.131	0.127	0.279	-0.240	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that there is a negative relationship between long-term debt and market capitalization. It indicates that increase in long-term debt leads to decrease in market capitalization. Similarly, there is a positive relationship between short term debt and market capitalization. It indicates that increase in short-term debt leads to increase in market capitalization. Likewise, total debt ratio has a positive relationship with market capitalization. It indicates that increase in total debt ratio leads to increase in market capitalization. In addition, there is a positive relationship between debt to equity ratio and market capitalization. It indicates that increase in debt to equity ratio leads to increase in market capitalization. Furthermore, liquidity ratio has a positive relationship with market capitalization. It indicates that higher the liquidity ratio higher would be the market capitalization. Moreover, there is a positive relationship between firm size and market capitalization. It indicates that larger the firm size, higher would be the market capitalization.

On the other hand, the result shows that there is a positive relationship between long term debt ratio and book value per share. It indicates that higher the long term debt ratio, higher would be the book value per share. Similarly, short term debt ratio has a positive relationship with book value per share. It indicates that higher the short term debt ratio, higher would be the book value per share. Likewise, there is a positive relationship between total debt ratio and book value per share. It indicates that increase in total debt ratio leads to increase in book value per share. Further, debt to equity ratio has a negative relationship with book value per share. It indicates that higher the debt to equity ratio, lower would be the book value per share. In addition, there is a negative relationship between liquidity ratio and book value per share. It indicates that increase in liquidity ratio leads to decrease in book value per share. Moreover, firm size has a negative relationship with book value per share. It indicates that larger the firm size, lower would be the book value per share.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4 and 5. More specifically, Table 4 shows the regression results of long term debt ratio, short term debt ratio, total debt ratio, debt to equity ratio, liquidity and firm size with market capitalization of Nepalese insurance companies.

Table 4

Estimated regression results of long term debt ratio, short term debt ratio, total debt ratio, debt to equity

ratio, liquidity and firm size on market capitalization

The results are based on panel data of 9 Nepalese insurance companies with 108 for the study period from 2011/12 to 2022/23 by using the linear regression model and the model is $MCAP = \beta_0 + \beta_1 LTD_{it} + \beta_2 STD_{it} + \beta_3 TDR_{it} + \beta_4 DTE_{it} + \beta_5 LIQR_{it} + \beta_6 SIZE_{it} + e_{it}$ where the dependent variable is MCAP (Market capitalization as measured by the number of outstanding shares and current market price, Rs. in billions). The independent variables are LTD (Long term debt ratio, in times), STD (Short term debt ratio, in times), TDR (Total debt ratio, in times), DTE (Debt to equity ratio, in times), LIQR (Liquidity ratio, in times) and FSIZE (Firm size, in number).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		LTD	STD	TDR	DER	LIQR	SIZE			
1	18.994 (2.631)	-122.906 (0.267)						0.153	11.38	0.071
2	9.565 (4.849)		1.325 (0.459)					0.008	11.41	0.211
3	9.538 (4.83)			1.372 (0.476)				0.008	11.41	0.226
4	4.369 (3.9400)				1.549 (8.527)			0.418	8.67	72.706
5	7.94 (1.056)					10.357 (0.802)		0.047	11.11	5.87
6	1.595 (0.905)						0.150 (5.792)	0.242	9.87	33.55
7	41.419 (1.056)	-1076.186 (1.234)	68.243 (1.562)					0.070	10.21	1.264
8	39.654 (0.816)	-955.083 (0.548)	52.158 (0.036)	117.841 (0.084)				0.160	11.42	0.677
9	13.199 (0.172)	-2619.784 (1.021)	498.243 (0.313)	597.897 (0.363)	9.618 (0.903)			0.217	11.69	0.688
10	22.47 (0.241)	-4168.339 (1.245)	1494.507 (0.710)	2.747 (0.029)	9.906 (0.872)	10.357 (0.802)		0.381	12.453	0.614
11	343.357 (3.410)	-5273.463 (4.436)	7.252 (-0.267)	2.747 (0.029)	0.895 (0.176)	35.159 (3.453)	2.655 (3.321)	0.735	5.46	4.873

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Market capitalization is the dependent variable.

Table 4 shows that the beta coefficients for long term debt is negative with market capitalization. It indicates that long term debt has a negative impact on market capitalization. This finding is similar to the findings of Etim *et al.* (2022). Similarly, the beta coefficients for short term debt are positive with market capitalization. It means that short term debt has a positive impact on market capitalization. This finding is consistent with the findings of Chaleeda *et al.* (2019). Likewise, the beta coefficients for total debt ratio are positive with market capitalization. It indicates that total debt ratio has a positive impact on market capitalization. This finding is not consistent with the findings of Akhmadi and Robiyanto (2020). Furthermore, the beta coefficients for debt to equity ratio are positive with market capitalization. It indicates that debt to equity ratio has a positive impact on market capitalization. This finding is similar to the findings of Lin and Chang (2011). Moreover, the beta coefficients for liquidity ratio has a positive impact with market capitalization. It indicates that liquidity ratio has a positive impact on market capitalization. This finding is not consistent with the findings of Jihadi *et al.* (2021). Likewise, the beta coefficients for size are positive with market capitalization. It indicates that size has a positive impact on market capitalization. This finding is similar to the findings of Sondakh (2019).

Table 5 shows the estimated regression results of long term debt ratio, short term debt ratio, total debt ratio, debt to equity ratio, liquidity and firm size on book value per share.

Table 5

Estimated regression results of long term debt ratio, short term debt ratio, total debt ratio, debt to equity ratio, liquidity and firm size on book value per share

The results are based on panel data of 9 Nepalese insurance companies with 108 for the study period from 2011/12 to 2022/23 by using the linear regression model and the model is $BVPS = \beta_0 + \beta_1 sLTD_{it} + \beta_2 STD_{it} + \beta_3 TDR_{it} + \beta_4 DTE_{it} + \beta_5 LIQR_{it} + \beta_6 SIZE_{it} + e_{it}$ where the dependent variable is BVPS (Book value per share as measured by the ratio of total shareholder equity to total number of outstanding shares, in Rs.). The independent variables are LTD (Long term debt ratio, in times), STD (Short term debt ratio, in times), TDR (Total debt ratio, in times), DTE (Debt to equity ratio, in times), LIQR (Liquidity ratio, in times) and FSIZE (Firm size, in number).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		LTD	STD	TDR	DER	LIQR	SIZE			
1	121.107 (17.453)	17.875 (1.103)						0.058	35.585	8.045
2	175.204 (23.23)		18.613 (1.769)					0.024	38.078	3.129
3	175.004 (23.191)			18.909 (1.798)				0.025	38.056	3.233
4	198.514 (39.356)				18.909 (1.798)			0.124	36.078	13.403
5	191.634 (36.255)					-2.527 (1.627)		0.019	38.29	2.647
6	205.572 (28.274)						-0.308 (3.051)	0.085	36.63	9.31
7	36.066 (0.305)	4788.773 (0.963)	96.063 (0.729)					0.673	32.81	12.27
8	16.645 (0.115)	9121.272 (1.754)	1420.823 (0.331)	1296.927 (0.309)				0.711	34.045	6.733
9	33.551 (0.130)	9653.767 (1.120)	1596.882 (0.298)	1525.883 (0.2760)	-3.076 (0.0860)			0.615	39.26	3.789
10	101.774 (0.295)	6691.815 (0.539)	308.692 (0.040)	274.472 (0.035)	-5.525 (0.06)	-19.81 (0.414)		0.468	46.151	2.234
11	1106.671 (2.126)	2392.177 (0.423)	21.92 (4.635)	171.056 (0.375)	-22.036 (0.911)	-108.625 (2.241)	-7.903 (2.077)	0.831	25.99	7.906

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Book value per share is the dependent variable.

Table 5 shows that the beta coefficients for long term debt are positive with book value per share. It indicates that long term debt has a positive impact on return on book value per share. This finding is similar to the findings of Jones and Edwin (2019). Similarly, the beta coefficients for short term debt are positive with book value per share. It means that short term debt has a positive impact on book value per share. This finding is consistent with the findings of Ha (2017). Likewise, the beta coefficients for total debt ratio are positive with book value per share. It indicates that total debt ratio has a positive impact on book value per share. This finding is not consistent with the findings of Akhtar et al. (2016). Furthermore, the beta coefficients for debt to equity ratio are negative with book value per share. It indicates that debt to equity ratio has a negative impact on book value per share. This finding is not consistent with the findings of Pertiwi and Hermanto (2017). Moreover, the beta coefficients for liquidity ratio has a negative impact with book value per share. It indicates that liquidity ratio has a negative impact on book value per share. This finding is not consistent with the findings of Sari and Sedana (2020). Likewise, the beta coefficients for size are negative with book value per share. It indicates that size has a negative impact on book value per share. This finding is similar to the findings of Ayuba and Abdulwahab (2019).

4. Summary and conclusion

A sound capital structure plays a pivotal role in a firm's ability to access various capital markets, which is essential for securing the resources necessary for growth and expansion. With a balanced capital structure, the firm can raise funds through debt issuance, such as bonds or loans, without over-leveraging itself. This allows the firm to tap into debt markets efficiently, securing the

capital needed for expansion while keeping the cost of borrowing low.

This study attempts to analyze the impact of capital structure on firm value in the context of Nepalese insurance companies. The study is based on secondary data of 9 insurance companies with 108 observations for the period from 2011/12 to 2022/23.

The major conclusion of this study is that long term debt has a negative impact on market capitalization. It indicates that higher the long term debt lower would be the capitalization. Short term debt, total debt ratio, debt to equity ratio, liquidity ratio and firm size have positive impact on market capitalization. The study also showed that long term debt ratio, short term debt ratio and total debt ratio have positive impact on book value per share. Moreover, debt to equity ratio, liquidity ratio and firm size have negative impact on book value per share. The study also concluded that a well-managed capital structure, characterized by an optimal mix of short-term and total debt alongside a balanced debt-to-equity ratio, contributes to investor confidence and perceived stability, thereby boosting market capitalization. Additionally, higher liquidity ratios and larger firm size further reinforce this effect by indicating a firm's ability to meet short-term obligations and maintain a robust market presence, making it more attractive to investors and enhancing its overall market valuation.

References

- Abor, J., 2007. Debt policy and performance of SMEs: Evidence from Ghanaian and South African firms. *The Journal of Risk Finance* 8(4), 364-379.
- Afinindy, I., U. Salim, and K. Ratnawati, 2021. The effect of profitability, firm size, liquidity, sales growth on firm value mediated capital structure. *International Journal of Business, Economics and Law* 24(4), 15-22.
- Aggarwal R. and N. A. Kyaw, 2006. Leverage, investment opportunities, and firm value: A global perspective. *Financial Development* 1(2), 1-26.
- Aggarwal, D., and P. C. Padhan, 2017. Impact of capital structure on firm value: Evidence from Indian Hospitality Industry. *Theoretical Economics Letters* 7(1), 982-1000.
- Agrawal, A., and C. R. Knoeber, 1996. Firm performance and mechanism to control agency problems between managers and shareholders. *Journal of Financial and Quantitative Analysis* 31(3), 377-397.
- Ahmad, S. M., R. Bakar, and M. A. Islam, 2020. The effect of debt financing on firm value: A panel data approach. *Albukhary Social Business Journal* 1(2), 33-45.
- Akhmadi, A., and R. Robiyanto, 2020. The interaction between debt policy, dividend policy, firm growth, and firm value. *The Journal of Asian Finance, Economics and Business* 7(11), 699-705.
- Akhtar, M. W., F. A. Khan, A. Shahid, and J. Ahmad, 2016. Effects of debt on value of a firm. *Journal of Accounting and Marketing* 5(4), 1-4.
- Ali, M. S., and R. Yadav, 2011. Theories of cost of capital: Analysis of cost of capital determinants. *International Research Journal of Management Science and Technology* 4(3), 695-704.
- Al-Najjar, B., and D. Al-Najjar, 2017. The impact of external financing on firm value and a corporate governance index: SME evidence. *Journal of Small Business and Enterprise Development* 24(2), 411-423.
- Annisa, R., and M. Chabachib, 2017. Analisis Pengaruh Current Ratio (CR), Debt to Equity Ratio (DER), Return on Assets (ROA) terhadap Price to Book Value (PBV) dengan Dividend Payout Ratio sebagai Variabel Intervening. *Diponegoro Journal of Management* 6(1) 1-15.
- Bhattarai, B. P., 2020. Effects of capital structure on financial performance of insurance companies in Nepal. *International Journal of Accounting and Financial Reporting* 10(3), 35-42.
- Bhattarai, Y., 2016. Capital structure and firm performance: Evidence from Nepalese manufacturing companies.

Journal for Studies in Management and Planning 2(3), 138-150.

- Bui, T. N., X. H. Nguyen, and K. T. Pham, 2023. The effect of capital structure on firm value: A study of companies listed on the Vietnamese stock market. *International Journal of Financial Studies* 11(3), 100-108.
- Chaleeda, M., A. Islam, T. S. T. Ahmad, and A. N. M. Ghazalat, 2019. The effects of corporate financing decisions on firm value in Bursa Malaysia. *International Journal of Economics and Finance* 11(3), 127-135.
- Etim, R. S., M. V. Asuquo, and U. Etim, 2022. Debt financing and firm value of listed consumer goods firms in Nigeria. *Journal of Administration and Corporate Governance* 2(1), 23-42.
- Fama, E. F., and K. R. French, 2012. Size, value, and momentum in international stock returns. *Journal of financial economics*, 105(3), 457-472.
- Ha, N. M., 2017. Impact of capital structure and cash holdings on firm value: Case of firms listed on the Ho Chi Minh stock exchange. *International Journal of Economics and Financial Issues* 7(1), 24-30.
- Habib, H. J., F. Khan, and M. I. Wazir, 2016. Impact of debt on profitability of firms. Evidence from non-financial sector of Pakistan. *City University Research Journal* 6(1), 70-80.
- Hatfield, B. G., T. W. Cheng, and N. W. Davidson. 1994. The determination of optimal capital structure. The effect of firm and industry debt ratio on market value. *Journal of Financial and Strategic Decision* 7(3), 1-14.
- Hirdinis, M., 2019. Capital structure and firm size on firm value moderated by profitability. *International Journal Of Economics And Business Administration* 7(1), 174-191.
- Jaishi, B., 2020. Capital structure and its impact on financial performance in insurance companies of Nepal. *Journal of Nepalese Business Studies* 13(1), 89-106.
- Jensen, M. C., and W. H. Meckling, 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3(4), 305-360.
- Jihadi, M., E. Vilantika, S. M. Hashemi, Z. Arifin, Y. Bachtiar, and F. Sholichah, 2021. The effect of liquidity, leverage, and profitability on firm value: Empirical evidence from Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(3), 423-431.
- Jones, A. S., and O. A. Edwin, 2019. Effect of debt financing on the corporate performance: A study of listed consumer goods firms in Nigeria. *Journal of Policy and Development Studies* 289(1), 1-12.
- Kontesa, M., 2015. Capital structure, profitability, and firm value, what's new? *Research Journal of Finance and Accounting* 6(20), 185-192.
- Lin, F. L., and T. Chang, 2011. Does debt affect firm value in Taiwan? A panel threshold regression analysis. *Applied Economics* 43(1), 117-128.
- Lubatkin, M., and S. Chatterjee, 1994. Extending modern portfolio theory into the domain of corporate diversification: does it apply? *Academy of Management Journal* 37(1), 109-136.
- Lumapow, L. S., and R. A. F. Tumiwa, 2017. The effect of dividend policy, firm size, and productivity to the firm value. *Research Journal of Finance and Accounting* 8(22), 20-24.
- Maharjan, A., 2017. Relationship between capital structure and profitability: A study of Nepalese commercial banks. *Nepalese Journal Management* 4(2), 96-111.
- Manu, R., T. Alhabsji, S. Rahayu, and N. Nuzula, 2019. The effect of corporate governance on profitability, capital structure and corporate value. *Research Journal of Finance and Accounting* 10(8), 202- 214.
- McConnel, J. J., and H. Servas. 1995. Equity ownership and the two faces of debt. *Journal of Financial Economics* 39(1), 131-157.
- Miller, M., 1977. Debt and Taxes. *Journal of Finance* 32(2), 259-275.

- Niresh, A., 2012. Capital structure and profitability in Srilankan banks. *Global Journal of Management and Business Research* 12(13), 83-89.
- Niu, X., 2008. Theoretical and practical review of capital structure and its determinants. *International Journal of Business and Management* 3(3), 133-139.
- Nurwulandari, A., 2021. Effect of liquidity, profitability, firm size on firm value with capital structure as intervening variable. *Scientific Journal of Accounting* 4(2), 257-271.
- Pertiwi, S. T., and S. B. Hermanto, 2017. Pengaruh Struktur Kepemilikan, Kebijakan Dividen, Hutangan Profitabilitas terhadap Nilai Perusahaan. *Jurnal Ilmu dan Riset Akuntansi*, 6(7), 1-23.
- Pradhan, R. S., and K. Pokharel, 2016. Capital structure and corporate performance: A case of Nepal. *Journal of Management Studies* 11 (2), 139-163.
- Pradhan, R. S., and R. Shrestha, 2015. Impact of bank specific and macroeconomic variables on the performance of Commercial Banks of Nepal. *Nepalese Journal of Business* 2(1), 73-84.
- Putri, M. O. D., and I. G. B. Wiksuana, 2021. The effect of liquidity and profitability on firm value mediated by dividend policy. *American Journal of Humanities and Social Sciences Research* 5(1), 204-212.
- Saad, N. M., 2010. Corporate governance compliance and the effects to capital structure. *International Journal of Economics and Finance* 2(1), 105-114.
- Sari, I. A. G. D. M., and I. B. P. Sedana, 2020. Profitability and liquidity on firm value and capital structure as intervening variable. *International research journal of management, IT and Social Sciences*, 7(1), 116-127.
- Setiadharm, S., and M. Machali, 2017. The effect of asset structure and firm size on firm value with capital structure as intervening variable. *Journal of Business and Financial Affairs* 6(4), 1-5.
- Shiu, Y., 2004. Determinants of United Kingdom general insurance company performance. *British Actuarial Journal* 10(5), 1079-1110.
- Sondakh, R., 2019. The effect of dividend policy, liquidity, profitability and firm size on firm value in financial service sector industries listed in Indonesia stock exchange 2015-2018 period. *Accountability* 8(2), 91-101.
- Soumadi, M., and O. Hayajneh, 2015. Capital structure and corporate performance: Empirical study of the public Jordanian shareholdings firms listed in Amman stock exchange. *Research Journal of Finance and Accounting* 6(4), 1-9.
- Stulz, R., 1990. Managerial discretion and optimal financing policies. *Journal of Financial Economics* 2(6), 3- 27.
- Watson, D., and A. Head, 2010. *Corporate Finance: Principles and Practice* (Pearson Education, New Jersey).

Chapter 12

Effect of leverage, operating efficiency, non-performing loan and capital adequacy on profitability of Nepalese commercial banks

- Sushmita Bhatta*

Abstract

This study examines the impact of leverage, operating efficiency, non-performing loan and capital adequacy on the profitability of Nepalese commercial banks. Return on assets and return on equity are the selected dependent variables. The selected independent variables are leverage, operating efficiency, non-performing loan, capital adequacy, loan loss provision and bank size. The study is based on secondary data of 15 commercial banks with 120 observations for the study period from 2015/16 to 2022/23. The data were collected from annual report and audited financial statement of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of different bank specific factors on the profitability of Nepalese commercial banks.

The results showed that bank size has a positive impact on return on assets and return on equity. It means that increase in bank size leads to increase in return on assets and return on equity. Similarly, capital adequacy ratio has a positive impact on return on assets. It means that increase in capital adequacy ratio leads to increase in return on assets. In contrast, loan loss provision has a negative impact on return on assets and return on equity. It means that increase in loan loss provision leads to decrease in return on assets and return on equity. Likewise, operational efficiency has a negative impact on return on assets and return on equity. It shows that higher the operational efficiency ratio, lower would be the return on assets and return on equity. Moreover, non-performing loan has a negative impact on return on assets and return on equity. It indicates that increase in non-performing loan leads to decrease in return on assets and return on equity. However, leverage ratio has a positive impact on return on equity. It shows that higher the leverage ratio, higher would be the return on equity.

Keywords: return on assets, return on equity, leverage, operating efficiency, non-performing loan, capital adequacy, loan loss provision, bank size

1. Introduction

Profitability is one of the key factors to ensure the stability of the banking system. With good profitability, the bank can benefit its own shareholders and continue to be a channel of capital to support other investments of individuals and organizations thereby promoting the development of the whole economy. Understanding the variables that impact the profitability of the banking industry is crucial. To ensure their stability, banks must manage risks effectively, maintain consistent profitability, and uphold public confidence, which is crucial for stakeholders including governments, owners, and managers (Kurnia and Christaria, 2016). For developing economies to achieve rapid growth, it is critical for commercial banks to operate efficiently. Bank failures, however, can lead to severe financial crises. Van Gestel and Baesens (2008) identified that commercial banks face a range of risks such as credit, liquidity, market, and operational that varies in magnitude and impact on their performance. One of the key factors in maintaining the stability of the financial system is bank profitability. A profitable bank supports its shareholders and generates funds for further investments by individuals and organizations, thus fostering economic growth (Phan et al., 2020). According to Athanasoglou et al. (2008), the performance and stability of the commercial banking sector contribute significantly to the overall health of the financial system.

A strong financial system plays a critical role in enabling growth and reducing vulnerability to crises among commercial banks. Stability of the financial system in an economy is an important catalyst for economic growth due to its function in facilitating exchange of value. The high level of

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bank capital boosts the confidence and trust of the public about the soundness of the bank (Carmona *et al.*, 2019). Commercial banks play important role for the development of the countries through the resource mobilization. Without sound and effective regulation, financial systems can become unstable, triggering crises that can devastate the real economy. Banks play a pivotal role in the shaping up of the economy of a country. Profit is the major reason behind every one to take greater amount of risk and make business successful. It is the central source of investment fund. In banking sector, the importance of banks' profitability can be appraised at the micro and macro levels of the economy (Kosmidou, 2008). Non-performing loans (NPLs) are crucial in determining bank profitability because elevated levels of NPLs adversely affect net profit by necessitating provisions for doubtful debts and the write-off of bad debt this, in turn, impacts both capital levels and profitability (Ombaba, 2013). Operational efficiency refers to the capacity to fulfill goods and items at an economical pricing not in compromising their quality. Increased operational efficiency directly impacts a company's profitability by reducing costs and improving economic efficiency. According to Sufian (2007), achieving high operational efficiency is crucial for maintaining a sustainable financial performance.

A well-managed institution is likely to operate efficiently, which can lead to better profitability and resource allocation. This improved financial performance can contribute to higher capital levels, as earnings can be retained to strengthen the institution's capital base (Abusharba *et al.*, 2013). The operating expenses of a bank play a significant role in determining its profitability. According to Mule *et al.* (2015), a lower cost efficiency ratio indicates that a smaller portion of the bank's revenue is being consumed by operating expenses. This suggests that the bank is effectively managing its costs, which can lead to higher profitability. Essentially, a lower ratio means that the bank is generating more profit from each unit of revenue, which is a positive indicator of financial health and efficiency. Therefore, banks aim to keep their cost efficiency ratio as low as possible to maximize profitability. Controlling operating expenses can give a bank a competitive advantage in the market. Banks that can offer competitive products and services while keeping their costs low are better positioned to attract customers and generate higher profits. Tsolas (2011) concluded that non-performing loans, loan loss provision and operational cost efficiency has significant negative impact on the financial performance of the private commercial bank of Ethiopia. Similarly, Dietrich and Wanzenried (2011) found a negative relationship between cost to income ratio and profitability. Similarly, poor operational performance can damage the bank's reputation, leading to loss of trust among customers and stakeholders. Rebuilding trust and repairing a damaged reputation can be costly and time-consuming, impacting profitability in the long term.

Vong and Chan (2009) examined profitability determinants in banks in Macao from 1993 to 2007. The study reported a significant negative relationship between loan loss provisions and bank profitability. Similarly, Elshaday *et al.* (2018) revealed a negative and statistically significant effect of loan loss provision on banks' financial performance. Ben Naceur and Goaid (2008) examined the impact of bank specific variables and macroeconomic indicators and financial structure's effect on banking sector's profitability in Tunisia from 1980 to 2000. The study concluded that capital adequacy ratio has a positive effect on profitability. Similarly, Jadhav *et al.* (2021) found that capital adequacy ratio has a positive impact on profitability. Likewise, Ebenezer *et al.* (2017) stated that CAR has a positive and significant effect on bank profitability. In addition, Olalekan and Adeyinka (2013) showed a positive and significant relationship between capital adequacy and profitability of bank. Fidanoski *et al.* (2018); Kusumastuti and Alam (2019) have reported a positive impact of capital adequacy ratio on bank profitability. These findings suggested that higher capital adequacy is associated with increased profitability, as it enhances the perceived safety of banks.

Silaban (2017) determined the Bank's health level consisting of capital adequacy ratio, net interest margin, and non-performing loans partially or simultaneously on bank profitability based on

data from the Indonesian Stock Exchange. The results indicate that capital adequacy ratio does not have a significant effect on bank profitability. Net interest margin improves the growth of bank profitability. The main goal of every banking institution is to operate profitably to maintain stability and sustainable growth. However, the existence of high levels of non-performing loans (NPLs) in the banking industry negatively affects the level of private investment, impair a bank's ability to settle its liabilities when they fall due and constrain the scope of bank credit to borrowers. Akter and Roy (2017) analyzed the impact of non-performing loan (NPL) on profitability of listed banks in Dhaka Stock Exchange (DSE) during 2008 to 2013. The study showed that non-performing loan is one of the major factors of influencing banks profitability and it has statistically significant negative impact on net profit margin (NPM) of listed banks for the study periods. Poor management in the banking institutions results in bad quality loans, and therefore, escalates the level of non-performing loans (Khan et al., 2020).

In the context of Nepal, Kafle (2023) explored the influence of credit risk management on the profitability of Nepalese commercial banks and found that capital adequacy positively affects profitability. Additionally, the study noted a negative impact of non-performing loan ratios on profitability. Khanal (2016) examined the bank specific and macroeconomic determinants of profitability of Nepalese commercial banks. The study found that equity to total assets, loan loss provision to total loan, GDP growth rate and inflation are positively correlated with return on assets and return on equity while expense to revenue ratio, total loan to total deposit ratio and bank size are negatively correlated with return on assets and return on equity. In contrast, Acharya and Vyas (2022) identified that non-performing loans, the cost of financing, and the capital adequacy ratio adversely impact bank profitability. Darlami (2023) examined the impact of credit risk, operational risk and liquidity risk on the profitability of Nepalese commercial banks. The results showed that non-performing loan, loan loss provision, leverage ratio, loan to deposit ratio and cost to income ratio have negative impact on return on assets. However, capital adequacy ratio has positive impact on return on assets. Likewise, capital adequacy ratio, non-performing loan, loan loss provision, leverage ratio, loan to deposit ratio and cost to income ratio have negative impact on return on equity.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of leverage, operating efficiency, non-performing loan and capital adequacy on bank profitability. Though there are above-mentioned empirical evidence in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The main purpose of the study is to analyze the effect of leverage, operating efficiency, non-performing loan and capital adequacy on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of leverage, operating efficiency, non-performing loan, capital adequacy loan loss provision and bank size with return on assets and return on equity in the context of Nepalese commercial banks.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results and the final sections draws conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 15 Nepalese commercial banks from 2015/16 to 2022/23, leading to a total of 120 observations. The main sources of data collected from the annual report and audited financial statement of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S. N.	Name of the banks	Study period	Observations
Public Banks			
1	Nepal Bank Limited	2015/16-2022/23	8
2	Rastriya Banijya Bank Limited	2015/16-2022/23	8
3	Agricultural Development Bank Limited	2015/16-2022/23	8
Joint Venture Banks			
4	Nabil Bank Limited	2015/16-2022/23	8
5	NMB Bank Limited	2015/16-2022/23	8
6	Nepal SBI Bank Limited	2015/16-2022/23	8
7	Standard Chartered Bank Nepal Limited	2015/16-2022/23	8
8	Himalayan Bank Limited	2015/16-2022/23	8
9	Everest Bank Limited		
Private Banks			
10	Citizens Bank International Limited	2015/16-2022/23	8
11	Siddhartha Bank Limited	2015/16-2022/23	8
12	NIC Asia Bank Limited	2015/16-2022/23	8
13	Prime Commercial Bank Limited	2015/16-2022/23	8
14	Sanima Bank Limited	2015/16-2022/23	8
15	Machhapuchchhre Bank Limited	2015/16-2022/23	8
Total number of observations			120

Thus, the study is based on the 120 observations.

The model

The model used in this study assumes that profitability depends on different bank specific factors. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables in this study are leverage, operating efficiency, non-performing loans, capital adequacy ratio, loan loss provisions and bank size. Therefore, the models take the following forms:

$$ROA_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 OE_{it} + \beta_3 CAR_{it} + \beta_4 NPL_{it} + \beta_5 LLP_{it} + \beta_6 BS_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 OE_{it} + \beta_3 CAR_{it} + \beta_4 NPL_{it} + \beta_5 LLP_{it} + \beta_6 BS_{it} + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

LEV = Leverage ratio as measured by the ratio of total liabilities to total equity, in percentage.

OE = Operating efficiency as measured by the ratio of operating expenses by operating income, in percentage.

CAR= Capital adequacy ratio as measured by the ratio of total capital to total risk weighted assets, in

percentage.

NPL= Non-performing loan as measured by non-performing loan to total loan, in percentage.

LLP = Loan loss provision is measured by loan loss provision to total loans, in percentage.

BSIZE = Bank size as measured by total assets, Rs. in billions.

The following section describes the independent variables used in this study along with hypothesis formulation.

Leverage

Leverage represents the extent to which a company is financed by debt compared to its equity. Harahap (2018) observed that debt ratio has a negative relationship with profitability. This finding aligns with the findings of Harisa et al. (2019). Similarly, Bintara (2020) presented evidence suggesting that leverage has a significant negative effect on profitability. This view is supported by Pratiwi et al. (2023), who also demonstrated a significant negative impact of leverage on financial performance. Based on it, this study develops the following hypothesis:

H₁: There is a negative relationship between leverage and banks profitability.

Operating efficiency

The relationship between operating efficiency and profitability is inversely correlated, meaning higher operating expenses typically lead to reduced profits (Uddin, 2022). Nur and Emanuel (2018) demonstrated that BOPO adversely affects profitability. Similarly, Adiatmayani and Panji (2021) found a significant negative relationship between operating efficiency and return on assets in state-owned banks in Indonesia. Dogan and Yildiz (2023) also observed a statistically significant negative impact of operating expenses on ROA. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between operating efficiency and banks profitability.

Capital adequacy ratio

Burke (1989) explored the determinants of bank performance across twelve countries in Europe, North America, and Australia, revealing a notable positive relationship between capital adequacy and profitability. Sufian and Habibullah (2009) also examined the connection between capital adequacy and profitability within the banking sector. The study found a positive association between capital adequacy ratio and banks profitability. Ben Naceur and Goaied (2008) analyzed the influence of bank-specific factors, macroeconomic indicators, and financial structures on banking profitability in Tunisia from 1980 to 2000, finding a favorable effect of CAR on profitability. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between capital adequacy ratio and banks profitability.

Non-performing loan

Akter and Roy (2017) examined the impacts of non-performing loan on profitability: An empirical study on banking sector of Dhaka stock exchange. The study revealed a negative correlation between the ratio of NPLs to total loans and both return on equity (ROE) and return on assets (ROA), which are key indicators of bank profitability. Trujillo-Ponce (2013) found that non-performing loans adversely affected both ROA and ROE in Spanish commercial banks. Additionally, Khan et al. (2020) identified an inverse relationship between non-performing loan ratios and ROE. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between non-performing loan and banks profitability.

Loan loss provision ratio

The policy governing loan-loss provisions significantly influences variations in banks' capital and profitability, which in turn affects their capacity to extend credit to the economy. Mennawi (2020) observed that the financial performance of Islamic banks in Sudan is negatively impacted by loan loss provisions. Ozili (2015) reported a negative but statistically insignificant relationship between return on assets and loan loss provisions. Moreover, Ahmed et al. (1999) identified a negative association between loan loss provisions and future earnings changes. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between loan loss provision ratio and banks profitability.

Bank size

Alfadli and Rjoub (2020) found that larger banks tend to exhibit improved ROE and ROA. Lohano and Kashif (2019) also reported that larger banks achieve higher returns on assets and equity. In Egypt, Kassem and Sakr (2018) demonstrated that bank size positively influences profitability as indicated by both ROA and ROE. Sahyouni and Wang (2018) also confirmed a positive link between bank size and bank profitability. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between bank size and banks profitability.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2015/16 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 15 Nepalese commercial banks for the study period from 2015/16 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total liabilities to total equity, in percentage), OE (Operating efficiency as measured by the total operating expenses to operating income, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted assets, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage) and BS (Bank size as measured by total assets, Rs. in billions).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.12	1.59	0.52
ROE	0.91	42.94	13.96	5.31
CAR	9.60	22.99	14.13	2.39
NPL	0.01	5.12	1.56	1.36
OE	20.35	71.57	43.15	9.82
LLP	0.07	10.39	2.38	1.98
LEV	0.99	18.34	8.57	2.78
BS	29.38	394.02	135.72	77.76

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed

and results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 15 Nepalese commercial banks for the study period from 2015/16 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total liabilities to total equity, in percentage), OE (Operating efficiency as measured by the total operating expenses to operating income, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted assets, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage) and BS (Bank size as measured by total assets, Rs. in billions).

Variables	ROA	ROE	CAR	NPL	OE	LLP	LEV	BS
ROA	1							
ROE	0.449**	1						
CAR	0.382**	-0.080	1					
NPL	-0.010	-0.253**	-0.056	1				
OE	-0.374**	-0.323**	-0.133	0.168	1			
LLP	-0.243**	-0.232*	-0.047	0.460**	0.460**	1		
LEV	-0.304**	0.256**	-0.504**	-0.023	0.208*	0.058	1	
BS	0.028	0.087	-0.026	0.172	-0.010	0.398**	-0.026	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively

Table 3 shows that bank size has a positive relationship with return on assets. It means that increase in bank size leads to increase in return on assets. Similarly, capital adequacy ratio has a positive relationship with return on assets. It means that increase in capital adequacy ratio leads to increase in return on assets. In contrast, there is a negative relationship between loan loss provision and return on assets. It means that increase in loan loss provision leads to decrease in return on assets. Likewise, operational efficiency has a negative relationship with return on assets. It shows that higher the operational efficiency ratio, lower would be the return on assets. Moreover, nonperforming loan has a negative relationship with return on assets. It indicates that increase in nonperforming loan leads to decrease in return on assets. Furthermore, leverage has a negative relationship with return on assets. It indicates that increase in leverage ratio leads to decrease in return on assets.

Likewise, the result also shows that bank size has a positive relationship with return on equity. It means that increase in bank size leads to increase in return on equity. Similarly, capital adequacy ratio has a negative relationship with return on equity. It means that increase in capital adequacy ratio leads to decrease in return on equity. In contrast, there is a negative relationship between loan loss provision and return on equity. It means that increase in loan loss provision leads to decrease in return on equity. Likewise, operational efficiency has a negative relationship with return on equity. It shows that higher the operational efficiency ratio, lower would be the return on equity. Moreover, nonperforming loan has a negative relationship with return on equity. It indicates that increase in nonperforming loan leads to decrease in return on equity. Furthermore, leverage has a positive relationship with return on equity. It indicates that increase in leverage ratio leads to increase in return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4 and 5. More specifically, Table 4 shows the regression results of leverage, operating efficiency, non-performing loan, capital adequacy ratio, loan loss provision and

bank size with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of leverage, operating efficiency, non-performing loan, capital adequacy ratio, loan loss provision and bank size with return on assets of Nepalese commercial banks

The results are based on panel data of 15 commercial banks with 120 observations for the period of 2015/16-2022/23 by using the linear regression model and the model is $ROA_{it} = \beta_0 + \beta_1 LEV + \beta_2 OE_{it} + \beta_3 CAR_{it} + \beta_4 NPL_{it} + \beta_5 LLP_{it} + \beta_6 BS_{it} + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total liabilities to total equity, in percentage), OE (Operating efficiency as measured by the total operating expenses to operating income, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted assets, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage) and BS (Bank size as measured by total assets, Rs. in billions).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		LEV	OE	CAR	NPL	LLP	BS			
1	2.08 (13.997)**	-0.057 (3.463)**						0.085	0.501	11.993
2	2.452 (12.169)**		-0.020 (4.375)**					0.132	0.487	19.143
3	0.412 (1.547)			0.084 (4.495)**				0.139	0.486	20.202
4	1.598 (21.842)**				-0.004 (0.109)			0.008	0.526	0.012
5	1.745 (23.913)**					-0.064 (2.720)**		0.051	0.510	7.401
6	1.618 (16.702)**						0.001 (0.302)	0.008	0.525	0.091
7	2.721 (12.455)**	-0.044 (2.783)**	-0.017 (3.822)					0.179	0.474	13.991
8	1.552 (3.670)**	-0.017 (0.952)	-0.017 (3.859)	0.065 (3.187)**				0.239	0.457	13.444
9	1.515 (3.551)**	-0.016 (0.881)	-0.017 (3.920)**	0.066 (3.226)**	-0.023 (0.730)			0.236	0.459	10.175
10	1.419 (3.314)**	-0.016 (0.891)	-0.014 (2.868)**	0.067 (3.293)**	-0.047 (1.359)	-0.042 (1.597)		0.246	0.454	8.760
11	1.419 (3.314)**	-0.016 (0.879)	-0.014 (2.719)**	0.067 (3.288)**	-0.047 (1.361)	-0.047 (1.361)	0.001 (0.250)	0.240	0.456	7.251

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for bank size are positive with return on assets. It indicates that bank size has a positive impact on return on assets. This finding is similar to the findings of Alfadli and Rjoub (2020). Likewise, the beta coefficients for capital adequacy ratios are positive with return on assets. It indicates that capital adequacy ratio has a positive impact on return on assets. This finding is consistent with the findings of Ben Naceur and Goaied (2008). However, the beta coefficients for loan loss provision are negative with return on assets. It indicates that loan loss provision has a negative impact on return on assets. This finding is similar to the findings of Ozili (2015). Similarly, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is consistent with the findings of Khan et al. (2020). In addition, the beta coefficients for operational efficiency are negative with return on assets. It indicates that operational efficiency has a negative impact on return on assets. This finding is similar to the findings of Dogan and Yildiz (2023).

Table 5 shows the estimated regression results of leverage, operating efficiency, non-performing loan, capital adequacy ratio, loan loss provision and bank size with return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of leverage, operating efficiency, non-performing loan, capital adequacy ratio, loan loss provision and bank size on return on equity of Nepalese commercial banks

The results are based on panel data of 15 commercial banks with 120 observations for the period of 2015/16-2022/23 by using the linear regression model and the model is $ROE_{it} = \beta_0 + \beta_1 LEV + \beta_2 OE_{it} + \beta_3 CAR_{it} + \beta_4 NPL_{it} + \beta_5 LLP_{it} + \beta_6 BS_{it} + e_{it}$ where, the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total liabilities to total equity, in percentage), OE (Operating efficiency as measured by the total operating expenses to operating income, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted assets, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage) and BS (Bank size as measured by total assets, Rs. in billions).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		LEV	OE	CAR	NPL	LLP	BS			
1	9.763 (6.370)**	0.489 (2.878)**						0.058	5.162	8.284
2	21.506 (0.304)**		-0.175 (3.707)**					0.058	5.162	8.284
3	16.458 (5.642)**			-0.177 (0.080)				0.002	5.323	0.754
4	15.504 (21.572)**				-0.177 (0.080)			0.056	5.166	8.098
5	15.439 (20.780)**					-0.226 (0.754)		0.046	5.195	6.687
6	15.439 (20.780)**						0.006 (0.951)	0.001	5.320	0.904
7	17.610 (8.044)**	0.645 (4.031)**	-0.213 (4.691)**					0.001	5.320	0.904
8	17.610 (8.044)**	0.694 (3.764)	-0.213 (4.691)**	-0.114 (0.538)				0.195	4.770	10.619
9	16.697 (3.820)**	0.658 (3.616)	-0.194 (4.274)**	-0.079 (0.381)	-0.177 (0.080)			0.222	4.691	9.472
10	16.692 (3.764)**	0.658 (3.600)**	-0.194 (4.274)**	-0.079 (0.380)	-0.177 (0.080)	-0.226 (0.754)		0.251	4.712	7.511
11	14.475 (3.165)**	0.668 (3.684)**	-0.194 (4.274)**	-0.194 (4.274)**	-0.692 (1.948)	-0.226 (0.754)	0.011 (1.749)	0.229	4.670	6.882

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Return on equity is the dependent variable.

Table 5 shows that that the beta coefficients for bank size are positive with return on equity. It indicates that bank size has a positive impact on return on equity. This finding is similar to the findings of Sahyouni and Wang (2018). Likewise, the beta coefficients for capital adequacy ratios are negative with return on equity. It indicates that capital adequacy ratio has a negative impact on return on equity. This finding is consistent with the findings of Sufian and Habibullah (2009). However, the beta coefficients for loan loss provision are negative with return on equity. It indicates that loan loss provision has a negative impact on return on equity. This finding is similar to the findings of Mennawi (2020). Similarly, the beta coefficients for non-performing loan are negative with return on equity. It indicates that non-performing loan has a negative impact on return on equity. This finding is consistent with the findings of Akter and Roy (2017). In addition, the beta coefficients for operational efficiency are negative with return on equity. It indicates that operational efficiency has a negative impact on return on equity. This finding is similar to the findings of Adiatmayani and Panji (2021).

4. Summary and conclusion

The banking sector is widely recognized as the driving force behind a country's economy. Evaluating the financial performance of financial institutions primarily involves assessing their profitability. The stability of the banking system is crucial for the effective functioning of the overall

financial system and the achievement of economic growth. Profitability, in particular, plays a crucial role in ensuring the stability of the banking system. When a bank maintains good profitability, it not only benefits its shareholders but also serves as a channel for capital, supporting investments by individuals and organizations. This, in turn, promotes the development of the entire economy.

This study attempts to analyze the effect of leverage, operational efficiency, non-performing loans, and capital adequacy on the profitability of commercial banks in Nepal. The study is based on secondary data of 15 commercial banks with 120 observations for the period from 2015/16 to 2022/23.

The major conclusion of the study is that operating efficiency, loan loss provision and non-performing loan have negative effect on return on assets and return on equity. The study showed that bank size has a positive effect on return on assets and return on equity. It means that increase in bank size leads to increase in return on assets and return on equity. Larger banks often benefit from economies of scale, allowing them to spread fixed costs over a larger asset base. As the bank grows in size, it can achieve operational efficiencies and reduce per-unit costs, leading to improved profitability measured by ROA and ROE. Access to cheaper funding can improve the bank's profitability metrics, positively impacting ROA and ROE. Similarly, capital adequacy ratio has a positive effect on return on assets. It means that increase in capital adequacy ratio leads to increase in return on assets. Adequate capital provides a buffer against unexpected losses and helps banks absorb shocks during economic downturns or adverse market conditions. This risk-absorbing capacity enhances confidence among depositors, creditors, and investors, which can lead to lower funding costs and improved profitability. The study also concluded that leverage, operating efficiency, and non-performing loan play significant role in determining the profitability of Nepalese commercial banks.

References

- Abusharba, M. T., I. Triyuwono, M. Ismail, and A. F. Rahman, 2013. Determinants of capital adequacy ratio (CAR) in Indonesian Islamic commercial banks. *Global Review of Accounting and Finance* 4(1), 159-170.
- Acharya, K. R., and S. K. Vyas, 2022. The impact of bank-specific and macroeconomic variables on commercial banks profitability in Nepal. *Patan Pragya* 10(1), 74-85.
- Adiatmayani, P. I. A., and S. I. B. Panji, 2021. The effect of credit risk and operational risk on profitability with capital adequacy variables as a mediating variable: A study on Indonesian state-owned banks for the period of 2015-2019. *Russian Journal of Agricultural and Socio-Economic Sciences* 7(1), 14-27.
- Ahmed, A. S., C. Takeda, and S. Thomas 1999. Bank loan loss provisions: a reexamination of capital management, earnings management and signaling effects. *Journal of Accounting and Economics* 28(1), 1-25.
- Akter, R., and J. K. Roy, 2017. The impacts of non-performing loan on profitability: An empirical study on banking sector of Dhaka stock exchange. *International Journal of Economics and Finance* 9(3), 126-132.
- Alfadli, A., and H. Rjoub, 2020. The impacts of bank-specific, industry-specific and macroeconomic variables on commercial bank financial performance: Evidence from the Gulf cooperation council countries. *Applied Economics Letters* 27(15), 1284-1288.
- Athanasoglou, P. P., S. N. Brissimis, and M. D. Delis, 2008. Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of international financial Markets, Institutions and Money* 18(2), 121-136.
- Ben Naceur, S., and M. Goaied, 2008. The determinants of commercial bank interest margin and profitability: Evidence from Tunisia. *Frontiers in Finance and Economics* 5(1), 106-130.
- Bintara, R., 2020. The effect of working capital, liquidity and leverage on profitability. *Saudi Journal of Economics and Finance Abbreviated* 4(1), 28-35.
- Bourke, P., 1989. Concentration and other determinants of bank profitability in Europe, North America and

- Australia. *Journal of Banking and Finance* 13(1), 65-79.
- Carmona, P., F. Climent, and A. Momparler, 2019. Predicting failure in the US banking sector: An extreme gradient boosting approach. *International Review of Economics and Finance* 61(2), 304-323.
- Darlami, S., 2023. Impact of credit risk, operational risk and liquidity risk on the profitability of Nepalese commercial banks. *Perspectives in Nepalese Management* 1(1), 107-120.
- Dietrich, A., and G. Wanzenried, 2011. Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money* 21(3), 307-327.
- Dogan, M., and F. Yildiz, 2023. Testing the factors that determine the profitability of banks with a dynamic approach: evidence from Turkey. *Journal of Central Banking Theory and Practice* 12(1), 225-248.
- Ebenezer, O. O., W. A. W. B. Omar, and S. Kamil, 2017. Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Nigeria. *International Journal of Finance and Banking Studies* 6(1), 25-38.
- Elshaday, T., D. Kenenisa, and S. Mohammed, 2018. Determinant of financial performance of commercial banks in Ethiopia: Special emphasis on private commercial banks. *African Journal of Business Management* 12(1), 1-10.
- Fidanoski, F., M. Choudhry, M. Davidović, and B. S. Sergi, 2018. What does affect profitability of banks in Croatia? *Competitiveness Review: An International Business Journal* 28(4), 338-367.
- Harahap, I. M., 2018. Impact of bank performance on profitability. *Scholars Journal of Economics, Business and Management* 5(8), 727- 733.
- Harisa, E., A. Mohamad, and I. Meutia, 2019. Effect of quality of good corporate governance disclosure, leverage and firm size on profitability of Islamic commercial banks. *International Journal of Economics and Financial Issues* 9(4), 189-196.
- Jadhav, J. J., A. Kathale, and S. Rajpurohit, 2021. An impact of capital adequacy ratio on the profitability of private sector banks in India—A study. *International Journal of Engineering and Management Research* 5(11), 37-45.
- Kafle, R., 2023. Impact of credit risk management on profitability of Nepalese commercial banks. *International Journal of Finance and Commerce* 5(1), 32-39.
- Kassem, N. M., and A. Sakr, 2018. The impact of bank-specific characteristics on the profitability of commercial banks in Egypt. *Journal of Finance and Bank Management* 6(2), 76-90.
- Khan, M. A., A. Siddique, and Z. Sarwar, 2020. Determinants of non-performing loans in the banking sector in developing state. *Asian Journal of Accounting Research* 5(1), 135-145.
- Khanal, B., 2016. Determinants of profitability in Nepalese commercial bank. *Nepalese Journal of Finance* 3(3), 41-51.
- Kosmidou, K., 2008. Factors influencing the profitability of domestic and commercial banks in the European Union. *Research in International Business and Finance* 21(2), 222-237.
- Kurniasari, A., M. Adam, and U. Hamdan, 2023. The effects of profit volatility, income smoothing, good corporate governance and non-performing financing on profit quality of sharia commercial banks. *Accounting* 9(1), 9-16.
- Kusumastuti, W. I., and A. Alam, 2019. Analysis of impact of CAR, NPF, BOPO on profitability of Islamic banks (Year 2015-2017). *Journal of Islamic Economic Laws* 2(1), 30-59.
- Lohano, K., and M. Kashif, 2019. Factors affecting the profitability of banks in developing countries. *NUML International Journal of Business and Management* 14(2), 1-18.
- Mennawi, A. N. A., 2020. The impact of liquidity, credit, and financial leverage risks on financial performance of

- Islamic banks: A case of Sudanese banking sector. *Risk and Financial Management* 2(2), 59-72.
- Mule, K. R., M. S. Mukras, and O. M. Nzioka, 2015. Corporate size, profitability and market value: An econometric panel analysis of listed firms in Kenya. *European Scientific Journal* 11(13), 346-396.
- Nur, E. Y., and K. Emanuel, 2018. The effect of credit risk on bank profitability with efficiency as the intervening variable. *Russian Journal of Agricultural and Socio-Economic Sciences* 74(2), 179-186.
- Olalekan, A., and S. Adeyinka, 2013. Capital adequacy and banks' profitability: Empirical evidence from Nigeria. *American International Journal of Contemporary Research* 3(10), 87-93.
- Ombaba, K. B. M., 2013. Assessing the factors contributing to non-performance loans in Kenyan banks. *European Journal of Business and Management* 5(32), 155-162.
- Ozili, P. K., 2015. Determinants of bank profitability and Basel capital regulation: Empirical evidence from Nigeria. *Research Journal of Finance and Accounting* 6(2), 124-131.
- Phan, H. T., T. N. Hoang, L. V. Dinh, and D. N. Hoang, 2020. The determinants of listed commercial banks' profitability in Vietnam. *The Journal of Asian Finance, Economics and Business* 7(11), 219-229.
- Pratiwi, W., A. Sumiati, and I. Muliasari, 2023. The effect of independent board of commissioners, firm size and leverage on banking financial performance in Indonesia. *International Journal of Multidisciplinary Research and Literature* 2(1), 45-58.
- Sahyouni, A., and M. Wang 2018. The determinants of bank profitability: Does liquidity creation matter? *Journal of Economics and Financial Analysis* 2(2), 61-85.
- Silaban, P., 2017. The effect of capital adequacy ratio, net interest margin and non-performing loans on bank profitability: The case of Indonesia. *International Journal of Economics and Business Administration* 5(3), 58-69.
- Sufian, F., 2007. The efficiency of Islamic banking industry: A non-parametric analysis with non-discretionary input variable. *Islamic Economic Studies* 14(1), 1-13.
- Sufian, F., and M. Habibullah, 2009. Bank specific and macroeconomic determinants of bank profitability: Empirical evidence from the China banking sector. *Frontiers of Economics in China; Beijing* 4(2), 274-291.
- Trujillo-Ponce, A., 2013. What determines the profitability of banks? Evidence from Spain. *Accounting and Finance* 53(2), 561-586.
- Tsolas, I. E., 2011. Modelling profitability and effectiveness of Greek-listed construction firms: an integrated DEA and ratio analysis. *Construction Management and Economics*, 29(8), 795-807.
- Uddin, M. K., 2022. Effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. *European Journal of Business and Management Research* 7(3), 289-295.
- Van Gestel, T., and B. Baesens, 2008. *Credit Risk Management: Basic Concepts: Financial Risk Components, Rating Analysis, Models, Economic and Regulatory Capital* (Oxford University Press, Oxford).
- Vong, P. I., and H. S. Chan, 2009. Determinants of bank profitability in Macao. *Macau Monetary Research Bulletin* 12(6), 93-113.

Chapter 13

Impact of capital adequacy and capital structure on stock return of Nepalese commercial banks

- Roshan Dahal*

Abstract

This study examines the impact of capital adequacy and capital structure on stock return of Nepalese commercial banks. Market price per share and stock return are the selected dependent variables. The selected independent variables are core capital ratio, capital adequacy ratio, long term debt to total equity, total equity to total assets, total debt to total assets, and total debt to total equity. The study is based on secondary data of 15 commercial banks with 105 observations for the study period from 2016/17 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks and Nepal Stock Exchange. The correlation coefficients and regression models are estimated to test the significance and importance of capital adequacy and capital structure on stock return of Nepalese commercial banks.

The study showed that core capital ratio has a positive impact on market price per share and stock return. It means that increase in core capital ratio leads to increase in market price per share and stock return. Similarly, capital adequacy ratio has a positive impact on market price per share and stock return. It means that increase in capital adequacy ratio leads to increase in market price per share and stock return. In contrast, long term debt to total equity has a negative impact on market price per share and stock return. It indicates that increase in long term debt to total equity leads to decrease in market price per share and stock return. However, total equity to total assets has a positive impact on market price per share and stock return. It indicates that higher the total equity to total assets, higher would be the market price per share and stock return. In addition, total debt to total assets has a positive impact on market price per share and stock return. It indicates that increase in total debt to total assets leads to increase in market price per share and stock return. Moreover, total debt to total equity has a positive impact on market price per share and stock return. It indicates that higher the total debt to total equity, higher would be the market price per share and stock return.

Keywords: core capital ratio, capital adequacy ratio, long term debt to total equity, total equity to total assets, total debt to total assets, total debt to total equity, market price per share, stock return

1. Introduction

A sufficient capital adequacy ratio is critical in ensuring that banks have enough cushion to absorb a reasonable amount of losses or financial shocks before they become insolvent and consequently lose depositors' funds. Benink *et al.* (2008) argued that capital adequacy is important because capital serves three significant functions in a company such as it makes a cushion or a buffer zone for any unexpected losses causing bankruptcy, equity capital creates incentives for managing risk to provide benefits or any kind of return to the shareholders and equity capital of the firm provide confidence to the lenders or investors. The banking sector is the driving force for a country's economy. Bank performance greatly affects the level of public trust, so it is important for banks to maintain good performance (Safitri *et al.*, 2020). Poor bank performance will lead to failure and lead to financial crises that will have negative consequences for economic development. Profit is one of the main goals of the banking industry. Performance is the company's ability to earn profits or a measure of the effectiveness of company management. A high level of performance indicate that the bank is working efficiently. A high level of performance can also illustrate that the productivity of the bank is getting better, and can show the development of the bank itself. Therefore, performance is very important both for the bank

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itself and for the customers (Suyono *et al.*, 2017). Similarly, Athanasoglou *et al.* (2006) stated that the banking sector acts as the life blood of modern trade and commerce to provide them with a major source of finance. This increasing phenomenon of globalization has made the concept of efficiency more important both for the non-financial and financial institutions and banks are the part of them. Banks largely depends on competitive marketing strategy that determines their success and growth. The modalities of the banking business have changed a lot in the new millennium compared to the way they used to be in the years bygone (Hussain and Bhatti, 2010).

Jheng *et al.* (2018) investigated the relationship between capital adequacy and share price. The study found that financial distress has a positive impact on share price while capital adequacy ratio has no impact on share price. Similarly, Cooper *et al.* (1991) examined the relationship between the stock market effect and risk based capital requirement studying international bank of different countries. The study showed that there is an adverse effect of new capital rule on stock market. Likewise, Rizzardi (2011) analyzed the effect of Basel committee announcement on stock prices. The study revealed that tier 1 capital has a negative impact on the stock prices. Further, Elindasari (2021) analyzed the impact of bank specific variables on stock price. The study concluded that return on assets has a negative but significant impact while earning per share, capital adequacy ratio and return on equity have positive but an insignificant impact on stock prices. In addition, Noor and Rosyid (2018) analyzed the effect of capital adequacy, loan to deposit ratio and return on equity on share price. The study concluded that there is an insignificant influence of return on equity while the loan to deposit ratio and capital adequacy ratio have positive influence on share price. Moreover, Nurazi and Usman (2016) investigated the bank stock return by contribution of fundamental and macroeconomic factors. The study found that capital adequacy has a positive but insignificant impact on the stock return.

Rohma (2023) analyzed the factor affecting the stock price. The study showed an insignificant and positive impact of non-performing loans on stock return while capital adequacy ratio has an insignificant and negative effect on stock return. Similarly, Brastama and Yadnya (2020) investigated the effect of capital adequacy ratio and non-performing loans on stock prices. The result concluded that non-performing loans has a negative impact on stock return and the result is significant. For the same analysis capital adequacy ratio has a positive and significant impact on stock price. Likewise, Yoewono and Ariyanto (2022) examined the impact capital adequacy ratio, credit risk, market risk, financial distress, inflation, and the exchange rate on stock return. The study revealed that credit risk has a positive impact on stock return while all the other variables doesn't impact the stock return including the capital adequacy ratio. Further, Budiyanto and Rusdiyanto (2021) assessed the relationship between macroeconomics and stock prices in the banking sector of Indonesia. The findings showed that capital adequacy ratio, loan to deposits ratio, nonperforming loans, return on asset, and operating costs have no significant influence on stock prices while return on equity has a positive and significant impact on stock prices. In addition, Ikhsan *et al.* (2022) analyzed the effect on firm value by mediating the variables by return on assets. The study concluded that independent commissioners and capital adequacy ratio to firm value mediated by return on assets showed that there is a partial impact while performing the analysis without return on assets it shows insignificant positive effect on firm value.

Chowdhury and Chowdhury (2010) examined the impact of capital structure on firm value. The study found that earnings per share, dividend payout ratio, percentage of public shareholding, fixed asset turnover, long term debt to total assets, current ratio, operating leverage, sales growth, and share capital have positive and significant impact on share price. Similarly, AlZou'bi *et al.* (2020) investigated the influence of capital structure on stock returns of industrial companies listed in ASE. The study concluded that short-term debt to equity, long-term debt to equity, total debt to total assets have positive impact on stock return. Likewise, AlZu'bi *et al.* (2021) assessed the impact of capital structure on stock

return. The study revealed that short-term debt to equity, long-term debt to equity, and total debt to total assets have positive and significant impact on stock return. Further, Tahmoorespour *et al.* (2015) analyzed the impact of capital structure on stock return by examining the 22 years' period from 1990 to 2012. The study showed that debt to equity ratio has a negative impact on return of firms. In addition, Barakat (2014) examined the relationship between financial structure, financial leverage, profitability and share value. The study concluded that profitability and capital structure have significant positive impact on stock price while financial leverage has a negative impact on stock price. Further, Hashim and Shahrumzaki (2020) examined the impact of profitability, leverage and dividend on stock price on food and beverage sector. The findings suggested that profitability has a significant impact on share price. The study also found that there is a negative and insignificant relationship between leverage ratio and share price.

Chambers *et al.* (2013) examined the relationship between capital structure and beta coefficient on stock return. The result showed that total debt/market value has a significant positive impact on both nominal and real stock returns. Similarly, Raza and Karim (2016) investigated the impact of financial leverage and liquidity on share price. The study found that firm size and dividend payout have positive impact on stock price. Likewise, Sharif *et al.* (2015) analyzed the factor affecting share prices. The study showed that return on equity, book value per share, dividend per share, dividend yield, earnings per share, price earnings and debt to assets have positive and significant impact on market price per share. Further, Fumani and Moghadam (2015) assessed the effect of capital structure on firm value, return on equity, earning per share. The study concluded that leverage ratio, return on equity, and earning per share have positive impact on firm value. In addition, Al Salamat and Mustafa (2016) examined the impact of capital structure on stock return. The study stated that growth, firm size, earning per share, profitability, and liquidity have positive and significant relationship with stock return. Moreover, Yoo and Wu (2019) investigated the interaction between capital structure and stock return. The study revealed that capital structure has a negative and insignificant impact on stock return.

Chughtai (2017) determined the impact of leverage on stock returns. The results indicated that leverage has a significant and negative impact on stock returns. Similarly, Andersson (2016) investigated the relationship between capital structure and stock returns for Swedish firms listed on the Stockholm stock exchange. The results suggested that there is a negative relationship between leverage and stock returns. The results also indicated that investors are not being compensated for the extra risk they are taking on when investing with high-leveraged firms. Likewise, Al-Manaseer (2020) analyzed the relationship between capital structure and stock return of commercial bank. The study showed that growth, profitability, and capital structure have a positive impact on stock returns whereas liquidity and firm size presents negative impact. Further, Kebriace-zadeh *et al.* (2013) assessed the relationship between fundamental factor and stock return. The study stated that debt-equity ratio, working capital to total asset, current ratio, net profit margin, operating cycle, market share, total asset, and exchange rate have positive and significant impact on stock return.

In the context of Nepal, Sapkota (2016) investigated the impact of firm specific and macroeconomic variables on share price. The study showed that earning per share, dividend per share, returns on assets, price earnings ratio and gross domestic product have positive impact on market price per share. Likewise, the leverage has a positive relationship with market price per share but the result is insignificant. Similarly, Pradhan *et al.* (2017) examined the impact of dividend policy on share price volatility. The study found that dividend yield, dividend payout, debt ratio, size, growth and earnings volatility have positive but an insignificant impact on share price volatility, change in market price per share and stock return. Likewise, Khatri (2019) analyzed the relationship different variables and stock return. The study stated that size, book to market ratio, leverage ratio, assets growth and

earning yield have positive impact on stock return. Further, Gautam (2017) analyzed the impact of firm specific variables with stock return and stock price volatility. The study concluded that dividend payout ratio, size, book-to-market ratio, earning price ratio, leverage, and growth of asset have positive impact on stock return and stock price volatility. In addition, Chalise (2019) examined the impacts of capital adequacy ratio and cost income ratio on the performance of Nepalese commercial banks. The study revealed that capital adequacy ratio has a negative and an insignificant impacts with bank performance measured by return on assets. However, bank size has a positive and an insignificant impact on bank performance. Similarly, Adhikari *et al.* (2020) assessed the impact of bank capital, liquidity, and credit risk on the performance of Nepalese commercial banks. The study stated that liquidity ratio and non-performing loan have negative impacts on return on assets and return on equity. The study also revealed that bank capital has a significant impact on performance of Nepalese commercial banks. Likewise, Budhathoki *et al.* (2020) examined the impacts of liquidity, leverage, and total size on banks' performance. The study revealed that loan to deposit ratio has a negative effect on the bank's return on assets and return on equity. Further, Neupane (2020) found that the performance of Nepalese commercial banks is insignificantly affected by size of the bank, deposit amount, capital base, loan and advances, number of branches and activities relating to off-balance sheet as the internal factors. Similarly, Gnawali (2018) analyzed the non-performing asset and its effects on performance of Nepalese commercial banks. The study found a negative effect of the non-performing loans on return on assets in the context of Nepalese public banks. Moreover, capital adequacy ratio, loan to deposit ratio and loan loss provision have positive relationship with the performance of banks in Nepal. Likewise, Khati (2020) examined the impacts of liquidity on performance of Nepalese commercial banks.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of capital adequacy and capital structure on stock return of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of capital adequacy and capital structure on stock return of Nepalese commercial banks. Specifically, it examines the relationship of core capital ratio, capital adequacy ratio, long term debt to total equity, total equity to total assets, total debt to total assets, and total debt to total equity with stock return of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 15 Nepalese commercial banks from 2016/17 to 2022/23, leading to a total of 105 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks and Nepal Stock Exchange. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	Observations
1	Citizens Bank International Limited	2016/17-2022/23	7
2	Everest Bank Limited	2016/17-2022/23	7
3	Global IME Bank Limited	2016/17-2022/23	7
4	Himalayan Bank Limited	2016/17-2022/23	7
5	Kumari Bank Limited	2016/17-2022/23	7
6	Machhapuchhre Bank Limited	2016/17-2022/23	7
7	Nabil Bank Limited	2016/17-2022/23	7
8	Nepal SBI Bank Limited	2016/17-2022/23	7
9	NIC Asia Bank Limited	2016/17-2022/23	7
10	NMB Bank Limited	2016/17-2022/23	7
11	Prabhu Bank Limited	2016/17-2022/23	7
12	Prime Commercial Bank Limited	2016/17-2022/23	7
13	Sanima Bank Limited	2016/17-2022/23	7
14	Siddhartha Bank Limited	2016/17-2022/23	7
15	Standard Chartered Bank Nepal Limited	2016/17-2022/23	7
Total number of observations			105

Thus, the study is based on the 105 observations.

The model

The model used in this study assumes that stock return depends upon capital adequacy and capital structure. The dependent variables selected for the study are market price per share and stock return. Similarly, the selected independent variables are core capital ratio, capital adequacy ratio, long term debt to total equity, total equity to total assets, total debt to total assets, and total debt to total equity. Therefore, the models take the following forms:

$$MPS = \beta_0 + \beta_1 T1 + \beta_2 CAR + \beta_3 LTDTE + \beta_4 TETA + \beta_5 TDTA + \beta_6 TDTE + e_{it}$$

$$SR = \beta_0 + \beta_1 T1 + \beta_2 CAR + \beta_3 LTDTE + \beta_4 TETA + \beta_5 TDTA + \beta_6 TDTE + e_{it}$$

Where,

MPS = Market price per share as measured by the last traded price in stock exchange for the fiscal year, in Rs.

SR = Stock return as measured by the ending stock price minus beginning stock price divided by beginning stock price, in percentage.

T1 = Core capital ratio as measured by the ratio of tier 1 capital to total risk weighted assets, in percentage.

CAR = Capital adequacy ratio as measured by the sum of core capital and supplementary capital divided by total risk weighted assets, in percentage

LTDTE = Long term debt to total equity as measured by the ratio of total long term debt to total equity, in percentage.

TETA = Total equity to total assets as measured by the total equity divided by total assets, in percentage.

TDTA = Total debt to total assets as measured by the total debt divided by total assets, in percentage.

TDTE = Total debt to total equity as measured by the total debt divided by total equity, in percentage.

The following section describes the independent variables used in this study along with the

hypothesis formulation:

Capital adequacy ratio

Capital adequacy is the level of capital necessary for a bank as determined by the regulatory and supervisory authorities to assume the banks financial health and soundness. According to Yoewono and Ariyanto (2022), capital adequacy ratio has a positive relationship with stock returns. Similarly, Dendawijaya (2005) stated that capital adequacy ratio has a positive and significant impact on stock return on market price per share. Likewise, Kuncoro and Suhardjono (2011) showed that capital adequacy has a positive impact on market price per share. In contrast, Yessica (2010) revealed that capital adequacy ratio have no significant relationship on stock price. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between capital adequacy ratio and stock return.

Total equity to total assets

Total equity-to-asset ratio is a measure of how much of a company's assets are owned by investors and how much of a company's assets are leveraged. Subastyan (2024) examined the effect of financial ratio on stock price. The study showed that leverage ratio does not significantly impact the share price. Likewise, leverage ratio has a partial impact on stock return (Kusumaharta, 2023). Similarly, Franklin and Muthusamy (2011) stated that financial leverage has a positive influence on value of the firm which is measured by stock price. Further, Aydemir *et al.* (2007) investigated the impact of financial leverage on the stock return. The study concluded that there is a positive relationship between financial leverage and stock price. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between total equity to total assets and stock return.

Long term debt to total equity

Kasmir (2014) stated that the higher the ratio, the less the capital itself is than to the indebtedness. To maintain consistency of the company's quality, personal capital should not be less than all of the company's debt (Sutrisno, 2012). Similarly, Abdullah *et al.* (2016) argued that debt to equity ratio has a positive impact on share prices. Likewise, Hussain and Gull (2023) concluded that there is a significant negative impact of long-term debt on stock returns. Further, Welch (2004) examined the impact of capital structure and stock return. The study showed that long term debt taken one-to five-year horizon have less impact on stock return. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between long term debt to total equity and stock return.

Total debt to total assets

Yoewono and Ariyanto (2022) stated that, as a company's debt level increases relative to its assets, its stock returns tend to decrease. The total debt to total assets ratio is a measure of a company's financial leverage, showing the proportion of its assets financed by debt. A higher ratio implies that the company is more heavily reliant on debt to finance its operations, which can be viewed negatively by investors for several reasons. Debt-to-assets ratio is a financial measure that shows how much of a company's assets are financed by debt. Hussain and Gull (2023) concluded that the debt to assets ratio have negative relationship between the stocks return and market price. The study also concluded a negative correlation between debt ratio and stock price which is supported by pecking order theory. Similarly, Murniati (2016) showed a positive impact of debt to assets on share return. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between total debt to total assets and stock return.

Total debt to total equity

Debt-to-equity ratio is the financial measure that compares a company's debt to its equity. It shows how much debt a company has compared to its equity. Hussain and Gull (2023) stated that debt to equity ratio has a negative relationship with market price. Similarly, Murniati (2016) concluded that share price is positively impacted by debt to equity ratio in Indonesia. Likewise, Irmala *et al.* (2011) revealed that leverage is significant determinant of share prices. Financial leverages are strong determinants of the market value of share prices in Nigeria (Uwuigbe *et al.*, 2012). In addition, Midani (1991) concluded that leverage is the influencing factor that lead to change in the share price. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between total debt to total equity and stock return.

Core capital ratio

As a company's core capital ratio increases, its stock returns tend to rise as well. The core capital ratio, which is a measure of a bank's financial stability and strength, reflects the proportion of its capital to its risk-weighted assets. A higher core capital ratio typically indicates that a bank is better capitalized, has more resources to absorb losses, and can better withstand economic downturns (Al-Manaseer, 2020). Core capital is a specific type of capital which is a measure of a bank's financial strength and resilience. According to Berger and Bouwman (2012), capital at the time of crisis helps in survival, profitability and market share while the capital considering the capital requirement presenting positive result. Rizzardi (2011) showed that stock price has reacted positively to capital adequacy framework. Based on it, this study develops the following hypothesis:

H₆: There is positive relationship between core capital ratio and stock return.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2016/17 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 15 Nepalese commercial banks for the study period of 2016/17 to 2022/23. The dependent variables are MPS (Market price per share as measured by the last traded price in stock exchange for the fiscal year, in Rs) and SR (Stock return as measured by the ending stock price minus beginning stock price divided by beginning stock price, in percentage). The independent variables are T1 (Core capital ratio as measured by the ratio of tier 1 capital to total risk weighted assets, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LTDTE (Long term debt to total equity as measured by the ratio of total long term debt to total equity, in percentage), TETA (Total equity to total assets as measured by the total equity divided by total assets, in percentage), TDTA (Total debt to total assets as measured by the total debt divided by total assets, in percentage) and TDTE (Total debt to total equity as measured by the total debt divided by total equity, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
MPS	160	2295	457.17	314.43
SR	-67.1	106.79	-9.32	38.17
T1	7.36	21.41	11.38	2.34
CAR	11.16	22.99	13.7	1.93
LTDTE	0	0.56	0.15	0.15
TETA	0.04	0.17	0.11	0.02
TDTA	0.09	0.94	0.87	0.12
TDTE	0.82	20.3	8.5	2.36

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 15 Nepalese commercial banks for the study period of 2016/17 to 2022/23. The dependent variables are MPS (Market price per share as measured by the last traded price in stock exchange for the fiscal year, in Rs) and SR (Stock return as measured by the ending stock price minus beginning stock price divided by beginning stock price, in percentage). The independent variables are T1 (Core capital ratio as measured by the ratio of tier 1 capital to total risk weighted assets, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LTDTE (Long term debt to total equity as measured by the ratio of total long term debt to total equity, in percentage), TETA (Total equity to total assets as measured by the total equity divided by total assets, in percentage), TDTA (Total debt to total assets as measured by the total debt divided by total assets, in percentage) and TDTE (Total debt to total equity as measured by the total debt divided by total equity, in percentage).

Variables	MPS	SR	T1	CAR	LTD/TE	TE/TA	TD/TA	TD/TE
MPS	1							
SR	0.122	1						
T1	0.342**	0.234*	1					
CAR	0.351**	0.073	0.850**	1				
LTDTE	-0.156	-0.192*	-0.573**	-0.200*	1			
TETA	0.235*	0.250**	0.754**	0.613**	-0.643**	1		
TDTA	0.116	0.026	-0.155	0.011	0.134	0.093	1	
TDTE	0.072	0.247*	-0.626**	-0.390**	0.677**	-0.771**	0.458**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 3 shows that core capital ratio has a positive relationship with market price per share. It means that increase in core capital ratio leads to increase in market price per share. Similarly, there is a positive relationship between capital adequacy ratio and market price per share. It means that increase in capital adequacy ratio leads to increase in market price per share. In contrast, there is a negative relationship between long term debt to total equity and market price per share. It indicates that increase in long term debt to total equity leads to decrease in market price per share. However, total equity to total assets has a positive relationship with market price per share. It indicates that higher the total equity to total assets, higher would be the market price per share. In addition, total debt to total assets has a positive relationship with market price per share. It indicates that increase in total debt to total assets leads to increase in market price per share. Moreover, total debt to total equity has a positive relationship with market price per share. It indicates that higher the total debt to total equity, higher would be the market price per share.

Similarly, the result also shows that core capital ratio has a positive relationship with stock return. It means that increase in core capital ratio leads to increase in stock return. Similarly, there is a positive relationship between capital adequacy ratio and stock return. It means that increase in capital adequacy ratio leads to increase in stock return. In contrast, there is a negative relationship between long term debt to total equity and stock return. It indicates that increase in long term debt to total equity leads to decrease in stock return. However, total equity to total assets has a positive relationship with stock return. It indicates that higher the total equity to total assets, higher would be the stock return. In addition, total debt to total assets has a positive relationship with stock return. It indicates that increase in total debt to total assets leads to increase in stock return. Moreover, total debt to total equity has a positive relationship with stock return. It indicates that higher the total debt to total equity, higher would be the stock return.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of core capital ratio, capital adequacy ratio, long term debt to total equity, total equity to total assets, total debt to total assets, and total debt to total equity with market price per share.

Table 4

Estimated regression results of core capital ratio, capital adequacy ratio, long term debt to total equity, total equity to total assets, total debt to total assets, and total debt to total equity with market price per share

The results are based on panel data of 15 commercial banks with 105 observations for the period of 2015/16-2021/22 by using the linear regression model and the model is $MPS = \beta_0 + \beta_1 T1 + \beta_2 CAR + \beta_3 LTDTE + \beta_4 TETA + \beta_5 TDTA + \beta_6 TDTE + e_{it}$ where the dependent variable is MPS (Market price per share as measured by the last traded price in stock exchange for the fiscal year, in Rs). The independent variables are T1 (Core capital ratio as measured by the ratio of tier 1 capital to total risk weighted assets, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LTDTE (Long term debt to total equity as measured by the ratio of total long term debt to total equity, in percentage), TETA (Total equity to total assets as measured by the total equity divided by total assets, in percentage), TDTA (Total debt to total assets as measured by the total debt divided by total assets, in percentage) and TDTE (Total debt to total equity as measured by the total debt divided by total equity, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		T1	CAR	LTDTE	TETA	TDTA	TDTE			
1	-65.88 (0.456)	45.97 (3.699)**						0.109	296.85	13.684
2	-65.88 (0.456)		57.06 (3.801)**					0.115	295.88	14.449
3	-65.88 (0.456)			-318.07 (1.607)				0.015	312.07	2.583
4	104.07 (0.707)				3307.86 (2.450)*			0.046	307.13	6.002
5	104.07 (0.707)					281.81 (1.040)		0.004	313.81	1.414
6	104.07 (0.707)						9.640 (0.737)	0.004	315.13	0.543
7	-265.69 (1.221)	21.43 (0.909)	34.98 (1.225)					0.113	396.13	7.626
8	-69.83 (0.248)			-89.07 (0.337)	3307.86 (2.450)*	281.81 (1.040)		0.037	308.51	2.345
9	-690.59 (2.156)*	61.25 (3.720)**		-78.34 (0.291)		284.62 (0.972)	25.430 (1.214)	0.127	293.78	4.785
10	-762.2 (1.970)*		58.45 (2.738)**	-445.88 (1.626)	3307.86 (2.450)*	14.850 (0.030)	39.960 (1.029)	0.120	294.89	3.849
11	-762.2 (1.970)*	-762.2 (1.970)*	34.41 (0.840)	-282.9 (0.779)	484.46 (0.109)	141.47 (0.261)	32.280 (0.797)	0.116	295.68	3.269

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Market price per share is the dependent variable.

Table 4 shows that the beta coefficients for core capital ratio are positive with market price per share. It indicates that core capital ratio has a positive impact on market price per share. This finding is similar to the findings of Berger and Bouwman (2012). Similarly, the beta coefficients for capital adequacy ratio are positive with market price per share. It indicates that capital adequacy ratio has a positive impact on market price per share. This finding is similar to the findings of Yoewono and Ariyanto (2022). In contrast, the beta coefficients for long term debt to total equity are negative with market price per share. It indicates that long term debt to total equity has a negative impact on market price per share. This finding is consistent with the findings of Kasmir (2014). However, the beta coefficients for total equity to total assets are positive with market price per share. It indicates that total equity to total assets has a positive impact on market price per share. This finding is consistent with the findings of Subastyan (2024). Further, the beta coefficients for total debt to total assets are positive

with market price per share. It indicates that total debt to total assets has a positive impact on market price per share. This finding is similar to the findings of Yoewono and Ariyanto (2022). Moreover, the beta coefficients for total debt to total equity are positive with market price per share. It indicates that total debt to total equity has a positive impact on market price per share. This finding is similar to the findings of Hussain and Gull (2023).

Table 5 shows the regression results of core capital ratio, capital adequacy ratio, long term debt to total equity, total equity to total assets, total debt to total assets, and total debt to total equity with stock return.

Table 5

Estimated regression results of core capital ratio, capital adequacy ratio, long term debt to total equity, total equity to total assets, total debt to total assets, and total debt to total equity on stock return

The results are based on panel data of 15 commercial banks with 105 observations for the period of 2015/16-2021/22 by using the linear regression model and the model is $SR = \beta_0 + \beta_1 T1 + \beta_2 CAR + \beta_3 LTDTE + \beta_4 TETA + \beta_5 TDTA + \beta_6 TDTE + e_{it}$ where the dependent variable is SR (Stock return as measured by the ending stock price minus beginning stock price divided by beginning stock price, in percentage). The independent variables are T1 (Core capital ratio as measured by the ratio of tier 1 capital to total risk weighted assets, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LTDTE (Long term debt to total equity as measured by the ratio of total long term debt to total equity, in percentage), TETA (Total equity to total assets as measured by the total equity divided by total assets, in percentage), TDTA (Total debt to total assets as measured by the total debt divided by total assets, in percentage) and TDTE (Total debt to total equity as measured by the total debt divided by total equity, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		T1	CAR	LTDTE	TETA	TDTA	TDTE			
1	-65.88 (0.456)	45.97 (3.699)**						0.109	296.85	13.684
2	-65.88 (0.456)		57.06 (3.801)**					0.115	295.88	14.449
3	-65.88 (0.456)			-318.07 (1.607)				0.015	312.07	2.583
4	104.07 (0.707)				3307.86 (2.450)*			0.046	307.13	6.002
5	104.07 (0.707)					281.81 (1.040)		0.004	313.81	1.414
6	104.07 (0.707)						9.640 (0.737)	0.004	315.13	0.543
7	-265.69 (1.221)	21.43 (0.909)	34.98 (1.225)					0.113	396.13	7.626
8	-69.83 (0.248)			-89.07 (0.337)	3307.86 (2.450)*	281.81 (1.040)		0.037	308.51	2.345
9	-690.59 (2.156)*	61.25 (3.720)**		-78.34 (0.291)		284.62 (0.972)	25.430 (1.214)	0.127	293.78	4.785
10	-762.2 (1.970)*		58.45 (2.738)**	-445.88 (1.626)	3307.86 (2.450)*	14.850 (0.030)	39.960 (1.029)	0.120	294.89	3.849
11	-762.2 (1.970)*	-762.2 (1.970)*	34.41 (0.840)	-282.9 (0.779)	484.46 (0.109)	141.47 (0.261)	32.280 (0.797)	0.116	295.68	3.269

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Stock return is the dependent variable.

Table 5 shows that the beta coefficients for core capital ratio are positive with stock return. It indicates that core capital ratio has a positive impact on stock return. This finding is similar to the findings of Rizzardi (2011). Similarly, the beta coefficients for capital adequacy ratio are positive with stock return. It indicates that capital adequacy ratio has a positive impact on stock return. This finding is similar to the findings of Dendawijaya (2005). In contrast, the beta coefficients for long term debt to total equity are negative with stock return. It indicates that long term debt to total equity has a negative impact on stock return. This finding is consistent with the findings of Welch (2004). However, the beta coefficients for total equity to total assets are positive with stock return. It indicates that total equity to

total assets has a positive impact on stock return. This finding is consistent with the findings of Franklin and Muthusamy (2011). Further, the beta coefficients for total debt to total assets are positive with stock return. It indicates that total debt to total assets has a positive impact on stock return. This finding is similar to the findings of Murniati (2016). Moreover, the beta coefficients for total debt to total equity are positive with stock return. It indicates that total debt to total equity has a positive impact on stock return. This finding is similar to the findings of Irmala *et al.* (2011).

4. Summary and conclusion

Bank and financial institution are those organizations where it accepts funds and deposits from general people and provide financial related services to people. As the role of financial intermediary, bank collect deposits and funds and create and distribute loan to the general people and organizations to help in increasing productivity by flowing funds in priority sector. This flow of funds from the bank helps in generating income from the difference in cost of deposits and the income from the loan provided. Capital structure is the particular combination of debt and equity used by a company to finance its overall operations and growth. Equity capital arises from ownership shares in a company and claims to its future cash flows and profits. Debt comes in the form of bond issues or loans, while equity may come in the form of common stock, preferred stock, or retained earnings. Short-term debt is also considered to be part of the capital structure. Capital structure is the way that firm generates the money to finance its operations. Capital structure of a firm describes the way in which a firm raises capital needed to establish and expand its business activities.

This study attempts to analyze the impact of capital adequacy and capital structure on stock return of Nepalese commercial banks. The study is based on secondary data of 15 commercial banks with 105 observations for the period from 2016/17 to 2022/23.

The major conclusion of this study is that core capital ratio, capital adequacy ratio, total equity to total assets, total debt to total assets, and total debt to total equity have positive impact on market price per share and stock return. It indicates that increase in core capital ratio, capital adequacy ratio, total equity to total assets, total debt to total assets, and total debt to total equity leads to increase in market price per share and stock return. However, long term debt to total equity has a negative impact on market price per share and stock return. It indicates that increase in long term debt to total equity leads to decrease in market price per share and stock return. Likewise, the study also concluded that capital adequacy ratio followed by core capital ratio is the most influencing factor that explains the changes in the market price per share in the context of Nepalese commercial banks. Similarly, the study also concluded that total equity to total debt followed by total debt to total equity is the most influencing factor that explains the changes in stock return in the context of Nepalese commercial banks.

References

- Abdullah, H., and A. Hartati, 2016. Pengaruh EPS, DER, PER, ROA dan ROE terhadap harga saham pada perusahaan tambang yang terdaftar di BEI untuk periode 2011-2013. *Dinamika Ekonomi: Jurnal Ekonomi dan Bisnis* 9(1), 1-20.
- Adhikari, K., K. Mainanli, and M. Kargbo, 2020. Impacts of bank capital, liquidity, and credit risk performance on Nepalese commercial banks. *Nepalese Journal of Finance* 7(3), 143-156.
- Al Salamat, W. A., and H. H. Mustafa, 2016. The impact of capital structure on stock return: Empirical evidence from Amman stock exchange. *International journal of business and social science* 7(9), 183-196.
- Al-Manaseer, S., 2020. Relationship between capital structure and stock returns of Jordanian commercial banks. *International Business Research* 13(2), 100-112.
- AlZou'bi, M. J., A. D. Bashatweh, and L. F. A. Khader, 2020. The influence of capital structure on stock returns—An empirical study on industrial companies. *Research in World Economy* 11(6), 362-370.

- AlZu'bi, M. J., M. I. O. Allahham, T. A. Abutaber, L. F. A. KHader, and S. A. Al-Jaghbi, 2021. The impact of capital structure on stock returns in industrial Jordanian companies listed in Amman stock exchange: Role of the responsibilities of the board directors, and disclosure and transparency as moderating variables. *Turkish Online Journal of Qualitative Inquiry* 12(7), 9972.
- Andersson, M. (2016). The effects of leverage on stock returns.
- Athanasoglou, P., M., Delis, and C. Staikouras, 2006. Determinants of financial performance in the South Eastern European region. *Munich Personal RePEc Archive* 1(1), 1-31.
- Aydemir, A. C., M. Gallmeyer, and B. Hollifield, 2007. Financial leverage and the leverage effect-a market and firm analysis. *Tepper School of Business* 142, 119-128.
- Barakat, A., 2014. The impact of financial structure, financial leverage and profitability on industrial companies' shares value (applied study on a sample of Saudi industrial companies). *Research Journal of Finance and Accounting* 5(1), 55-66.
- Benink, H., J. Danielsson, and Á. Jónsson, 2008. On the role of regulatory banking capital. *Financial Markets, Institutions and Instruments* 17(1), 85-96.
- Berger, A. N., and C. H. Bouwman, 2013. How does capital affect bank performance during financial crises? *Journal of Financial Economics* 109(1), 146-176.
- Brastama, R. F., and I. P. Yadnya, 2020. The effect of capital adequacy ratio and non-performing loan on banking stock prices with profitability as intervening variable. *American Journal of Humanities and Social Sciences Research (AJHSSR)* 4(12), 43-49.
- Budhathoki, P. B., K. C. Rai, P. K. Lamichhane, G. Bhattarai, and A. Rai, 2020. The impacts of liquidity, leverage, and total size on banks' performance: Evidence from Nepalese commercial banks. *Journal of Economics and Business* 3(2), 123-135.
- Budiyanto, A. P. S., and W. H. Rusdiyanto, 2021. The capital adequacy ratio and the loan to deposit ratio influence on the price of banking companies: Evidence from Indonesia. *Multicultural Education* 7(6), 174-154.
- Chalise, S., 2019. The impacts of capital adequacy ratio and cost income ratio on the performance of Nepalese commercial banks. *International Journal of Economics and Management* 6(7), 78-83.
- Chambers, N., F. H. Sezgin, and B. Karaaslan, 2013. An analysis of the effects of capital structure and the beta coefficient on stock returns: A case study of the Istanbul Stock Exchange (ISE)-Manufacturing industry. *International Journal of Business and Social Science* 4(7), 279-290.
- Chowdhury, A., and S. P. Chowdhury, 2010. Impact of capital structure on firm's value: Evidence from Bangladesh. *Business and Economic Horizons* 3(3), 111-122.
- Chughtai, S., 2017. The impact of investor sentiment on return of different industries in Pakistan. *NICE Research Journal*, 1-23.
- Cooper, K., J. Kolari, and J. Wagster, 1991. A note on the stock market effects of the adoption of risk-based capital requirements on international banks in different countries. *Journal of Banking and Finance* 15(2), 367-381.
- Dendawijaya, L., 2005. *Manajemen Perbankan* (Ghalia Indonesia, Bogor).
- Elindasari, N., 2021. ROA, ROE, CAR, and EPS on the stock price of PT bank Mandiri (Persero) Tbk with GARCH. *Indonesian Financial Review* 1(1), 33-45.
- Fumani, M. A., and A. Moghadam, 2015. The effect of capital structure on firm value, the rate of return on equity and earnings per share of listed companies in Tehran Stock Exchange. *Research Journal of Finance and Accounting* 6(15), 50-57.
- Franklin, J. S., & K. Muthusamy, 2011. Impact of leverage on firms investment decision. *International Journal of Scientific and Engineering Research* 2(4), 14-28.

- Gautam, R., 2017. Impact of firm specific variables on stock price volatility and stock returns of Nepalese commercial banks. *International Journal of Research in Business Studies and Management* 4(6), 33-44.
- Gnawali, A., 2018. Non-performing asset and its effects on performance of Nepalese commercial banks. *Journal of Research in Business Studies and Management* 5(9), 39-47.
- Hashim, S. L. B. M., and N. I. I. B. Shahrumzaki, 2020. The impact of profitability, leverage and dividend on the share price of food and beverage sector in Malaysia. *Global Business and Management Research* 12(4), 535-539.
- Hussain, A., and S. Gul, 2023. Impact of capital structure on stock return in the mediating role of firm performance: A Case Study of Oil and Gas Sector Listed on PSX. *International Journal of Contemporary Issues in Social Sciences* 2(1), 48-57.
- Hussain, H. and G. A. Bhatti, 2010. Evidence on structure conduct performance hypothesis in Pakistani commercial banks. *International Journal of Business and Management* 5(9), 174-187.
- Ikhsan, M., S. Jumono, A. Munandar, and A. Abdurrahman, 2022. The effect of non-performing loan (NPL), independent commissioner (KMI), and capital adequacy ratio (CAR) on firm value (PBV) mediated by return on asset (ROA). *Quantitative Economics and Management Studies* 3(5), 810-824.
- Irmala, P., S. Sanju and M. Ramachandran, 2011. Determinants of share prices in India. *Journal of Emerging Trends in Economics and Management Sciences* 2(2), 124-130.
- Jheng, T. J., A. R. A. Latiff, O. C. Keong, and T. Chue, 2018. The relationship between capital adequacy ratio and stock price of banking institutions: Evidence from Malaysia. *Management* 5(3), 67-87.
- Kebriaee-zadeh, A., S. Zartab, S. F. Fatemi, and R. Radmanesh, 2013. Fundamentals and Stock Return in Pharmaceutical Companies: A Panel Data Model of Iranian Industry: Hydrogel based tablet for vaginal candidiasis. *Iranian Journal of Pharmaceutical Sciences* 9(1), 55-60.
- Khati, P., 2020. Impacts of liquidity on performance of Nepalese commercial banks. *Journal of Economics and Finance* 11(6), 26-33.
- Khatri, K., 2019. Explaining cross-section of stock return: A comparative analysis of listed financial and non-financial firms in Nepal. *International Journal of Scientific and Research Publications* 9(11), 592-599.
- Midani, A., 1991. Determinants of Kuwaiti stock prices: An empirical investigation of industrial services, and food company shares. *International Journal of Business and Social Science* 6(10), 1485-1488.
- Murniati, S., 2016. Effect of capital structure, company size and profitability on the stock price of food and beverage companies listed on the Indonesia Stock Exchange. *Information Management and Business Review* 8(1), 23-29.
- Neupane, B. P., 2020. Performance determinants of Nepalese commercial banks. *Press Academia Procedia* 12(5), 40-45.
- Noor, M. I., and P. I. Rosyid, 2018. Effect of capital adequacy ratio (CAR), loan to deposit ratio (LDR) and return on equity (ROE) on share price PT bank Danamon Indonesia, TBK. *International Journal of Business and Applied Social Science (IJBASS)* 4.
- Nurazi, R., and B. Usman, 2016. Bank stock returns in responding the contribution of fundamental and macroeconomic effects. *Journal of Economics and Policy* 9(1), 134-149.
- Pradhan, P., R. Shyam, and N. Gautam, 2017. Dividend policy and share price volatility: A case of Nepalese commercial banks. (September 27, 2017).
- Raza, S. A., and M. Z. A. Karim, 2016. Do liquidity and financial leverage constrain the impact of firm size and dividend payouts on share price in emerging economy? *Journal of Finance and Economics Research* 1(2), 73-88.
- Rizzardi, F. (2011). How do Basel committee announcements affect bank stock prices? Available at SSRN 2012596.

- Rohma, R., 2023. Analysis of factors affecting stock price in banking companies listed on the Indonesia stock exchange with return on assets (ROA) as an intervening variable (empirical study of conventional banking companies listed on the Indonesia Stock Exchange for the 2018-2021 Period).
- Safitri, K. Y. D., I. M. Mertha, N. G. P. Wirawati, and A. A. Dewi, 2020. The impacts of debt to equity ratio, price earnings ratio, earning per share to the stock price on banking sectors listed in infobank15 Index 2014-2018. *American Journal of Humanities and Social Sciences Research* 4(5), 49-56.
- Sapkota, A., 2016. Firm specific and macro-economic determinant of share prices of Nepalese commercial banks. *Nepalese Journal of Business* 3(4), 132-147.
- Sharif, T., H. Purohit, and R. Pillai, 2015. Analysis of factors affecting share prices: The case of Bahrain Stock Exchange. *International Journal of Economics and Finance* 7(3), 207-216.
- Subastyan, G. M., 2024. The effect of financial ratios on stock prices. *Eduvest-Journal of Universal Studies* 4(3), 1244-1257.
- Suyono, C., S. Teddy, and J. Irawati, 2017. Analisis Faktor yang Mempengaruhi Profitabilitas Perbankan (Studi Bank Umum di Indonesia Period 2006-2010). *Procuratio* 5(2), 262-275.
- Tahmoorespour, R., M. Ali-Abbar, and E. Randjbaran, 2015. The impact of capital structure on stock returns: International evidence. *Hyperion Economic Journal* 1(3), 56-78.
- Uwuigbe, U., O. Olusegun, and G. Agu, 2012. An assessment of the determinants of share price in Nigeria: A study of selected listed firms. *Acta Universitatis Danubius* 8(6), 78-88.
- Welch, I., 2004. Capital structure and stock returns. *Journal of Political Economy* 112(1), 106-131.
- Yoewono, H., and S. Ariyanto, 2022. The impact of capital adequacy ratio, credit risk, market risk, financial distress, and macroeconomic toward stock return with audit quality as moderator. *Accounting and Finance Studies* 2(4), 213-228.
- Yoo, S., and J. Wu, 2019. Capital structure and stock returns: Evidence from Korean Stock Market. *Global Business and Finance Review* 24(4), 8-23.

Part IV:

Financial Technology

Chapter 14

Impact of financial technology on performance of Nepalese commercial banks

- Anu Gurung and Radhe Shyam Pradhan, Ph.D.*

Abstract

The study examines the impact of financial technology on the performance of Nepalese commercial banks. Bank performance is the dependent variable. The selected independent variables are internet banking, mobile banking, POS banking, digital wallet, digital lending and virtual assistance. The primary source of data is used to assess the opinions of the respondents regarding financial technology in Nepalese commercial banks. The study is based on primary data with 164 observations. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of different factors of financial technology on the performance of Nepalese commercial banks.

The study showed that internet banking has a positive impact on bank's performance. It implies that better the internet banking service provided by the bank, higher would be the bank's performance. Similarly, mobile banking has a positive impact on bank's performance indicating that secured and updated mobile banking service leads to increase in bank's performance. Likewise, POS banking has a positive impact on bank's performance. It shows that efficient POS banking service leads to increase in bank's performance. Moreover, digital wallet has a positive impact on bank's performance implying that efficient and user-friendly digital wallet service leads to increase in bank's performance. Similarly, digital lending has a positive impact on bank's performance. It reveals that secure and transparent digital lending system leads to increase in bank's performance. The result also showed that virtual assistance has a positive impact on bank's performance. It reveals that reliable and helpful virtual assistance service leads to increase in bank's performance.

Keywords: performance, internet banking, mobile banking, POS banking, digital wallet, digital lending, virtual assistance

1. Introduction

Nowadays the ways businesses operate and deliver their products to the customers are changed by the technology in almost all of the sectors. These changes of business operations have not passed by the financial sector, and especially the commercial banks. The recent revolution of Financial Technology (FinTech) has distinctly directed the intersection of Finance and Technology, both leading sectors around the world. FinTech, an emerging industry, uses technology and innovation techniques to improve financial activities and compete with traditional financial methods. Currently, governments of all countries pay more attention to financial technology. Banks are actively integrating Fintech to seek transformation, innovation and development. FinTech refers to the new financial model involving technology as the carrier providing financial services such as mobile payments, financial management, cloud computing, as well as other emerging scientific and technological means (Schueffel, 2016). Today's banks have a distinct opportunity to engage consumers through Fintech innovation that supports savings, purchases, and investments. The financial and economic crisis of 2008, the enhanced regulation, changes in consumer behaviour and social outlook, new global economic and social trends are the main reasons for the considerable and consequential change in the financial segment. However, the most influential catalyst behind the technological development of the sector is digital transformation (Nicoletti, 2017). Schueffel (2016) argued that the modern financial market combined with modern information technology to generate the field of FinTech. Similarly, Gomber *et al.* (2017) believed that FinTech is a cutting-edge technology, which transforms the financial market through

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network technology. Liu and Huang (2020) hold the view that FinTech includes internet finance, mobile payment, big data technology and artificial intelligence. Competition has been redefined by the effective adoption of these electronic channels and payment systems, including phone/mobile banking, automated teller machines, electronic funds transfer and internet banking. Arnaboldi and Claeys (2008) showed that internet banking has more contribution to the performance of the bank when compared to traditional branch banking and improve competition in the sector.

Aduda and Kingoo (2012) established a positive relationship between e-banking and financial performance of banks. Continuous innovation and digitalization play pivotal roles in enhancing efficiency across various activities. By embracing technological advancements and fostering a culture of innovation, organizations can streamline processes, reduce costs, and improve overall performance metrics. Innovation fosters the development of new products, services, and operational methodologies that meet evolving consumer demands and market dynamics. This adaptability not only enhances customer satisfaction but also strengthens competitiveness in an increasingly digital landscape. Karimzadeh *et al.* (2014) investigated the impact of e-banking on the profitability of a bank in Iran. By using quarterly data over the period of 2004–2012, the study found that expansion of e-banking has a significant positive association with the profitability, measured in terms of ROA. Moreover, Oyewole *et al.* (2013) examined the impact of e-banking on bank performance in Nigeria. Using panel data of 1999–2010 for eight commercial banks, the study found that e-banking has a significant positive impact on the bank's performance measured in terms of return on assets and net interest margin. Due to emergence of global economy, e-business has increasingly become a necessary component of business strategy and a strong catalyst for economic development. E-banking has become popular because of its convenience and flexibility, and also transaction related benefits like speed, efficiency, accessibility, etc. Rahman (2007) assessed the impact of financial technology on the performance of the banks operating in Bangladesh. The study found that technology adopted banks experienced improved performance as they gain maturity.

Nimako *et al.* (2013) assessed the impact of internet banking on service quality in the context of commercial banks and merchant banks of Ghana. The study revealed that as more and more customers adopt the internet for their banking transactions, it becomes important for management of banks to be innovative in their approach for meeting customer requirement. Firdous and Farooqi (2017) revealed that the internet banking service quality dimensions have a significant impact on the satisfaction level of internet banking customers. Each of the dimension namely efficiency, system availability, fulfillment, privacy, contact, responsiveness and contact individually contribute 70 percent to the overall customer satisfaction in internet banking. Kamotho (2008) stated that mobile phone banking usage experience observed that competition triggers innovation and creativity. Continuous innovation not only yield new products but rather promotes efficiency in the performance of activities. Egland *et al.* (1998) estimated the number of US banks offering internet banking and analyzed the structure and performance characteristics of these banks. The study established no evidence of major differences in the performance of the group of banks offering Internet banking activities compared to those that do not offer such services in terms of profitability, efficiency or credit quality. Vyas *et al.* (2008) showed that the internet banking institutions were performing significantly better than the non-Internet groups. Additionally, the risk variables associated with the internet group continued to be lower relative to the non-internet group. According to Malhotra and Singh (2009), internet banking is not having an independent impact on financial performance

Onay and Ozsoz (2013) concluded that use of internet banking services leads to a higher banking efficiency. Likewise, internet banking has positive but statistically insignificant relationship with financial performance of banks in Ethiopia (Yasin, 2018). Likewise, Dzombo *et al.* (2017) found

that branchless banking such as automated teller machines banking, phone banking, internet banking (IB) and point of sale banking have significant positive effect on financial performance of commercial banks. Risk is an unavoidable part of doing business. Murat and Isaac (2019) found that the effect of internet banking on the performance is positive and significant. Likewise, Noah *et al.* (2019) found that internet banking has a significant and positive influence on productivity through efficiency and profitability. The study concluded that internet banking leads to strategic advantage against competitors and increases the likelihood of customer loyalty due to round the clock banking services. Similarly, Mateka *et al.* (2016) found that internet banking has positive impact on banks and productivity and profitability i.e., incomes, operating costs, and loan book and customer deposits. Likewise, Dinh *et al.* (2015) concluded that there is a positive impact of internet banking on bank's productivity and profitability and it is statistically significant. The study also showed adoption of internet banking helps to reduce operating costs due to cutting spending for operations and fixed assets at the bank branches.

In the context of Nepal, Joshi (2015) analyzed the impact of online banking system on customer satisfaction and performance of commercial banks. The study revealed that the online banking determinants such as ease of use, usefulness, security, responsiveness and efficiency have positive impact on return on assets (ROA) and return on equity (ROE) of Nepalese commercial banks. According to Khatri and Dhungel (2013), the majority of the account holders use internet and have some knowledge about the internet banking provided by their bank. However, they have not developed the habit of utilizing these facilities. Awareness about internet banking and its benefits and security were identified as the major reason behind less utilization of internet banking among the customers. The synergy between continuous innovation and digitalization empowers organizations to achieve higher levels of efficiency, agility, and sustainability. By continually investing in innovation and embracing digital transformation, businesses can drive growth, improve performance outcomes, and remain resilient in a rapidly evolving global economy.

Shakya (2016) examined the relationship between online banking system on customer satisfaction and performance of Nepalese commercial banks. The study found that customers' satisfaction, ease of use, usefulness, security, responsiveness and efficiency are positively related to organization performance. Sethi (2020) examined the determinants factors affecting customer satisfaction in online banking in Nepal. The study showed that service quality, system availability, security and ease to use have positive impact on customer satisfaction in online banking. Likewise, Bohara (2020) showed that internet security and privacy, responsiveness, system availability and reliability have positive impact on customer satisfaction. The study concluded that better internet banking service quality in banking sector has significant impact on the customer satisfaction.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of financial technology on the bank performance. Though there are above-mentioned empirical evidence in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to analyze the impact of financial technology on the performance in the context of Nepalese commercial banks. Specifically, it examines the relationship of internet banking, mobile banking, POS banking, digital wallet, digital lending with the performance in the context of Nepalese commercial banks.

The reminder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 164 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on internet banking, mobile banking, POS banking, digital wallet, digital lending and virtual assistance in the context of Nepalese commercial banks. The study is based on descriptive and causal comparative research designs.

The model

The model used in this study assumes that bank's performance depends upon financial technology. The dependent variables selected for the study are bank's performance. Similarly, the independent variables selected for the study are internet banking, mobile banking, POS banking, digital wallet, digital lending and virtual assistance. Therefore, the model takes the following form:

$$BP = \beta_0 + \beta_1 IB + \beta_2 MB + \beta_3 POS + \beta_4 DW + \beta_5 DL + \beta_6 VA + e$$

Where,

IB = Internet banking

MB= Mobile banking

POS = Point of sale

DW = Digital wallet

DL = Digital lending

VA =Virtual assistance

BP = Bank's performance

The following section describes the independent variables used in this study along with hypothesis formulation.

Bank performance was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agrees. There are 5 items and sample items include "Bank's performance is better because of the internet banking services provided by them", "Virtual assistance service has increased bank's performances" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.944$).

Internet banking was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agrees. There are 5 items and sample items include "Internet banking transactions are processed efficiently and without delays", "I am satisfied with the performance of Nepalese commercial banks in delivering internet banking services" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.980$).

Mobile banking was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agrees. There are 5 items and sample items include "Mobile banking services are user-friendly and easy to navigate", "I am satisfied with the performance of Nepalese commercial banks in delivering mobile banking services" and so on.

The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.927$).

POS banking was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agrees. There are 5 items and sample items include "POS systems are technologically advanced and up-to-date", "I am satisfied with the performance of Nepalese commercial banks in delivering POS services" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.941$).

Digital wallet was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agrees. There are 5 items and sample items include "Nepalese commercial banks provide reliable and secure digital wallet services", "I am satisfied with the performance of Nepalese commercial banks in delivering digital wallet services" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.935$).

Digital lending was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agrees. There are 5 items and sample items include "Internet banking transactions are processed efficiently and without delays", "I am satisfied with the performance of Nepalese commercial banks in delivering digital lending services" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.940$).

Virtual assistance was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agrees. There are 5 items and sample items include "Nepalese commercial banks provide reliable and helpful virtual assistance services", "I am satisfied with the performance of Nepalese commercial banks in delivering virtual assistance services" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.955$).

The following section describes the independent variables used in this study along with hypothesis formulation.

Internet banking

Mukherjee and Nath (2003) defined internet banking as a banking activity through which people can perform banking transactions such as checking account balances and making payments through technology and communication network. The increase use of internet was an additional channel of marketing banking services products and had significantly improved the financial performance of banks in Kenya (Acharya *et al.*, 2008). Ngango *et al.* (2015) observed a positive relationship of internet banking with the performance of banks. Implementing internet banking services significantly enhances a bank's operational efficiency, customer satisfaction, and competitive edge. The convenience and accessibility offered by internet banking attract a broader customer base and foster increased customer loyalty. Additionally, internet banking reduces operational costs and streamlines banking processes, contributing to improved financial performance. Malhotra and Singh (2009) underlined positive association between internet banking services and higher banking efficiency. Similarly, Mateka *et al.* (2016) revealed that internet banking has positive influence on bank incomes, operating costs, loan book and customer deposit. By embracing digital transformation and focusing on enhancing the user experience, banks can achieve higher performance metrics and meet the evolving demands of their customers. Overall, the integration of internet banking is a vital component in driving a bank's success in today's digital age. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship of internet banking with bank's performance.

Mobile banking

Mobile banking is a service provided by a bank or other financial institution that allows its customers to conduct financial transactions remotely using a mobile device such as Smartphone or tablet. Kiplangat and Tibbs (2018) found a significant positive influence of mobile banking on financial performance of commercial banks. The adoption of mobile banking services has led to enhanced operational efficiency, reduced transaction costs, and improved customer satisfaction. By providing customers with convenient, on-the-go access to banking services, mobile banking has increased transaction volumes and fostered greater customer engagement and loyalty (Bonface and Ambrose, 2015). Furthermore, mobile banking has enabled banks to expand their reach, tapping into previously underserved markets and thus broadening their customer base. This expansion, coupled with the streamlined processes that mobile banking offers, has translated into improved financial metrics, including higher revenues and profitability (Anyasi and Otuba, 2009). Aghdaie and Faghani (2012) stated that investing in mobile banking technology not only meets the growing consumer demand for digital services but also strengthens the bank's competitive position and financial performance in the rapidly evolving banking industry. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship of mobile banking with bank's performance.

POS banking

POS banking is the point at which a customer makes a payment to the merchant digitally in exchange for goods or after provision of a service. According to Adeniran et al. (2022), POS banking facilitates convenient, secure, and efficient payment processing at merchant locations, thereby enhancing customer satisfaction and operational efficiency for banks. By enabling seamless transactions and expanding payment options, POS banking drives increased transaction volumes and revenue streams for financial institutions. Aliabadi et al. (2016) revealed that POS payment system and ATM banking services helps to enhance the performance of Iranian private banks. Morufu (2016) showed the impact of POS adoption by banks was positive and significant on the financial performance of commercial banks. Moreover, POS banking contributes to improved liquidity management and reduced operational costs, further bolstering a bank's financial performance. The integration of POS systems also enhances the overall customer experience, promoting loyalty and retention among merchants and consumers alike. Odhiambo and Memba (2012) assessed the relationship between adoption of credit cards and credit card holders' satisfaction, and establish whether the adoption of credit cards improved commercial banks revenue. The results showed that credit cards contributed positively to satisfaction of credit card holders and adoption of credit cards improved commercial banks revenue. Similarly, POS technology enhance service delivery, banks can strengthen their market position, drive profitability, and meet the evolving expectations of their clientele effectively. Le and Ngo (2020) analyzed that the deployment of POS technology leads to sales increases and expense reductions which positively impact profitability and customer satisfaction and firm performance. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship of POS banking with bank's performance.

Digital wallet

Digital wallets offer customers a convenient and secure way to conduct financial transactions, both online and offline, which enhances customer satisfaction and loyalty. By providing seamless integration with various payment platforms and services, digital wallets attract a broader customer base and drive transaction volumes. Barry and Jan (2018) indicated that privacy and security of

digital wallet positively influence the performance of the bank. Nizam *et al.* (2019) monitored digital wallets implementation in Malaysia. The study revealed that performance and profitability of bank is positively linked with the use of digital wallet. The use of digital wallets enables banks to reduce operational costs associated with traditional banking methods while improving efficiency in transaction processing. This efficiency translates into enhanced liquidity management and operational performance for financial institutions. According to Razif *et al.* (2020), e-wallet have a significant relationship with the performance of the bank. Digital wallet technology can significantly contribute to the overall performance and competitiveness of banks in today's digital economy. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship of digital wallet with bank's performance.

Digital lending

Digital lending is the process of offering loans that are applied for, disbursed, and managed through digital channels, in which lenders use digitized data to inform credit decisions and build intelligent customer engagement (Ewert *et al.*, 2000). Nyabuti *et al.* (2023) assessed the effects of digital lending on performance of commercial banks in Kissi county, moderating role of government policies. The study showed that loan application positive significant correlations with the bank's performance. Vala *et al.* (2022) found digital lending to have positive impact on the performance of bank with regard of the traditional lending system. Aduda and Kingoo (2012) found the positive impact of digital lending with the performance of the bank. Moreover, digital lending reduces operational costs associated with traditional loan processing methods, improving overall efficiency and profitability for financial institutions. The ability to offer personalized loan products based on data-driven insights further enhances customer satisfaction and retention rates. Khenkin (2023) found that digital lending has significant relationship with the bank performance. Digital lending platforms facilitate streamlined loan origination processes, faster approval times, and enhanced customer convenience, thereby attracting a larger pool of borrowers. By leveraging technology to automate credit assessment and decision-making, banks can mitigate risks more effectively while expanding their lending portfolio. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship of digital lending with bank's performance.

Virtual assistance

Virtual assistance is a computer program or device that is connected to the internet and can understand spoken questions and instructions, designed to help you to make plans, find answers to questions, etc. Bala *et al.* (2023) found that improvement in the bank's performance is due to customization of the chatbot. Moreover, virtual assistants streamline routine banking tasks such as account inquiries, transaction processing, and customer service queries, thereby reducing operational costs and increasing staff productivity. This operational efficiency contributes to improved financial metrics and profitability for banks. Al-Hawari and Ward (2006) found that AI powered chatbots has significant impact on the performance and profitability of bank and financial institution. Embracing virtual assistance technology represents a strategic opportunity for banks to enhance their performance by delivering superior customer service, optimizing operations, and driving sustainable growth in the evolving digital landscape. Stoica *et al.* (2015) found that virtual assistance has improved the service spectrum of Romanian banks with the potential of decreasing costs, while maintaining customer satisfaction. Thus, virtual assistance has positive impact on performance of Romanian banks. Jagathi (2021) found that virtual assistance has significant relation with the performance and has supported Indian banks in upgrading their operations across the board, from accounting to sales to contracts and

cybersecurity. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship of virtual assistance with bank's performance.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with means and standard deviations have been computed, and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau coefficients between dependent and independent variables. The correlation coefficients are based on 164 observations. The dependent variable is BP (Bank's performance). The independent variables are IB (Internet banking), MB (Mobile banking), POS (Point of sale), DW (Digital wallet), DL (Digital lending) and VA (Virtual assistance).

Variables	Mean	SD	BP	IB	MB	POS	DW	DL	VA
BP	3.554	0.988	1						
IB	3.479	0.933	0.611**	1					
MB	3.523	1.034	0.625**	0.644**	1				
POS	3.400	0.974	0.624**	0.624**	0.688**	1			
DW	3.445	0.971	0.624**	0.595**	0.603**	0.571**	1		
DL	3.103	0.938	0.520**	0.523**	0.537**	0.516**	0.567**	1	
VA	3.036	1.025	0.517**	0.485**	0.504**	0.519**	0.515**	0.655**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 1 shows that internet banking is positively correlated to bank's performance. It implies that better the internet banking service provided by the bank, higher would be the bank's performance. Similarly, mobile banking is positively related to bank's performance indicating that secured and updated mobile banking service leads to increase in bank's performance. Likewise, POS banking has a positive relationship with bank's performance. It shows that efficient POS banking service leads to increase in bank's performance. Moreover, digital wallet is positively correlated to bank's performance implying that efficient and user-friendly digital wallet service leads to increase in bank's performance. Similarly, digital lending has a positive relationship with bank's performance. It reveals that secure and transparent digital lending system leads to increase in bank's performance. The result also shows that there is a positive relationship between virtual assistance and bank's performance. It reveals that reliable and helpful virtual assistance service leads to increase in bank's performance.

Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and results are presented in Table 2. More specifically, Table 2 shows the regression results of internet banking, mobile banking, POS banking, digital wallet, digital lending and virtual assistance on the performance in Nepalese commercial banks.

Table 2

Estimated regression results of internet banking, mobile banking, POS banking, digital wallet, digital lending, virtual assistance on banks performance of Nepalese commercial banks

The results are based on 164 observations by using linear regression model. The model is $BP = \beta_0 + \beta_1 IB + \beta_2 MB + \beta_3 POS + \beta_4 DW + \beta_5 DL + \beta_6 VA + e$ where, the dependent variable is BP (Bank's performance). The independent variables are IB (Internet banking), MB (Mobile banking), POS (Point of sale), DW (Digital wallet), DL (Digital lending) and VA (Virtual assistance).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		IB	MB	POS	DW	DL	VA			
1	0.648 (3.516)**	0.835 (16.322)**						0.620	0.609	266.39
2	0.851 (5.186)**		0.767 (17.169)**					0.643	0.59	294.77
3	0.867 (4.909)**			0.791 (15.840)**				0.605	0.621	250.89
4	0.822 (4.59)**				0.793 (15.847)**			0.605	0.621	251.14
5	1.356 (6.827)**					0.709 (11.568)**		0.449	0.733	133.82
6	1.605 (8.86)**						0.642 (11.356)**	0.440	0.740	128.95
7	0.504 (2.994)**	0.414 (4.966)**	0.457 (6.08)**					0.689	0.551	181.245
8	0.41 (2.457)*	0.338 (3.989)**	0.305 (3.481)**	0.263 (3.139)**				0.705	0.537	130.75
9	0.298 (1.825)	0.231 (2.67)**	0.23 (2.65)**	0.207 (2.525)*	0.272 (3.705)**			0.727	0.516	109.302
10	0.267 (1.612)	0.224 (2.581)**	0.211 (2.389)*	0.199 (2.417)*	0.25 (0.28)	0.074 (1.131)		0.727	0.516	87.856
11	0.274 (1.659)	0.213 (2.448)*	0.212 (2.410)*	0.189 (2.298)*	0.238 (3.117)**	0.017 (0.224)	0.09 (1.325)	0.728	0.515	73.85

Notes:

1. Figures in parenthesis are t-values
2. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
3. Bank performance is the dependent variable.

The result shows that the beta coefficients for internet banking are positive with bank's performance. It implies that the internet banking has positive impact on bank's performance. This finding is consistent with the findings of Ngango *et al.* (2015). Similarly, the beta coefficients for mobile banking are positive with bank's performance. It implies that the mobile banking has positive impact with bank's performance. This finding is similar to the findings of Kiplangat and Tibbs (2018). In addition, the beta coefficients for POS banking are positive with bank's performance. It implies that the POS banking has positive impact on bank's performance. This finding is consistent with the findings of Morufu (2016). Moreover, the beta coefficients for digital wallet are positive with bank's performance. It implies that the digital wallet has positive impact bank's performance. This finding is similar to the findings of Nizam *et al.* (2019). Furthermore, the beta coefficients for digital lending are positive with bank's performance. It implies that digital lending has positive impact on bank's performance. This finding is consistent with the findings of Nyabuti *et al.* (2023). Similarly, the beta coefficients for virtual assistance are positive with bank's performance. It implies that the virtual assistance has positive impact on bank's performance. This finding is similar to the findings of Stoica *et al.* (2015).

4. Summary and conclusion

The introduction of internet banking in the bank ensures that banks operate at a cheaper cost, have 24 hours internet service availability as well as encourage ICT competence of customers in order to realize high performance in terms of organizational effectiveness, efficiency and business

expansion. The widespread availability of internet banking is expected to affect the combination of financial services produced by banks. Those banks produce and distribute these services which results in better financial performances. The application of financial technology concepts, techniques, policies and implementation strategies to banking services has become a subject of significant importance and concern of all banks. As a result of this fintech improvement, business environment in financial sector is extremely dynamic and experiences rapid changes and thus, it demands commercial banks to serve their customers through the use of internet.

The study also attempted to analyze the impact of financial technology on the performance in the context of Nepalese commercial banks. This study is based on primary data with 164 respondents.

The major conclusion of study is that internet banking, mobile banking, POS banking, digital wallet, digital lending and virtual assistance have positive impact on the performance of Nepalese commercial banks. The study concluded that FinTech is very important to increase the level of bank performance. The study also concluded that mobile banking followed by internet banking is the most influencing factor that explains the changes in banks performance in the context of Nepalese commercial banks.

References

- Acharya, R. N., A. Kagan, and S. Lingam, 2008. Online banking applications and community bank performance. *International Journal of Bank Marketing* 26(6), 418-439.
- Adeniran, A. M., M. S. Burodo, and S. Suleiman, 2022. Customer satisfaction with the point of sale (POS) system: Moderating role of age. *Gusau Journal of Business Administration* 1(2), 10-15.
- Aduda, J., and N. Kingoo, 2012. The relationship between electronic banking and financial performance among commercial banks in Kenya. *Journal of Finance and Investment Analysis* 1(3), 99-118.
- Aghdaie, S. F. A., and F. Faghani, 2012. Mobile banking service quality and customer satisfaction. *International Journal of Management and Business Relation* 2(4), 351- 361.
- Al-Hawari, M., and T. Ward, 2006. The effect of automated service quality on Australian banks' financial performance and the mediating role of customer satisfaction. *Marketing Intelligence and Planning* 24(2), 127-147.
- Aliabadi, H. S., H. Gheysari, and S. Ahmadian, 2016. A survey on the impact of using "POS" and "ATM" on profitability (Return on Assets) of Iranian private banks. *Iranian Journal of Business and Economics* 3(3), 21-27.
- Anyasi, F. I., and P. A. Otubu, 2009. Mobile phone technology in banking system: Its economic effect. *Research Journal of Information Technology* 1(1), 1-5.
- Bala, D. E., S. Stancu, A. Pernici, and M. I. Vulpe, 2023. Impact of personalization on improving a chatbot's performance. Case study for a banking virtual assistant. *Informatics in Economy* 12(1), 259-270.
- Barry, M., and Jan, M. T. 2018. Factors influencing the use of m-commerce: An extended technology acceptance model perspective. *International Journal of Economics, Management and Accounting* 26(1), 157-183.
- Bohara, A., 2020. Impact of internet banking service quality on customer satisfaction of Nepalese commercial banks. *Nepalese Journal of Business* 7(2), 36-46.
- Bonface, R. M., and J. Ambrose, 2015. Mobile banking and financial performance of commercial banks in Kenya. *International journal of Finance and Current Business Studies* 4(12), 16-31.
- Dinh, V., U. Le, and P. Le, 2015. Measuring the impacts of internet banking to bank performance: Evidence from

- Vietnam. *Journal of Internet Banking and Commerce* 20(2), 103-108.
- Dzombo, G. K., M. K. James, and M. James, 2017. The effect of branchless banking strategy on the financial performance of commercial banks in Kenya. *International Journal of Financial Research* 8(4), 167-183.
- Egland, K. L., K. Gurst, D. E. Nolle, and D. Robertson, 1998. Special studies on technology and banking: Banking over the Internet. *Quarterly Journal* 17(4), 25-30.
- Ewert, R., A. Szczesmy, and G. Schenk, 2000. Determinants of bank lending performance in Germany. *Schmalenbach Business Review* 52(1), 344–362.
- Firdous, S., and R. Farooqi, 2017. Impact of internet banking service quality on customer satisfaction. *The Journal of Internet Banking and Commerce* 22(1), 1-17.
- Gomber, P., J. A. Koch, and M. Siering, 2017. Digital Finance and FinTech: current research and future research directions. *Journal of Business Economics* 87(1), 537-580.
- Jagathi, P. H., 2021. A study on correlation between ATMs and financial performance of select banks with reference to virtual banking. *Asian Journal of Management* 12(1), 1-5.
- Joshi, R. 2015. Impact of online banking on customer satisfaction of Nepalese commercial banks. *Nepalese Journal of Management* 2(2), 36-45.
- Kamotho, A. D., 2008. Mobile phone banking: Usage experiences in Kenya. *Management Decision* 63(9), 444-458.
- Karimzadeh, D. S. D., D. M. Emadzadeh, and J. Shateri, 2014. The effects of electronic banking expansion on profitability of a commercial bank (Sepah bank of Iran). *Indian Journal of Scientific Research* 4(6), 305-312.
- Khatri, J. R., and K. U. Dhungel, 2013. Internet banking in Nepal: use and challenges. *Banking Journal* 3(2), 57-77.
- Khenkin, S. M., 2022. Prospects for the government of Pedro Sanchez in the context of socio-political situation in Spain. *Cuadernos Iberoamericanos* 9(3), 10-19.
- Kiplangat, K., D., and C. Tibbs, 2018. Financial innovations and financial performance of commercial banks. *International Journal of Innovative Research and Development* 7(5), 36-41.
- Le, T. D., and T. Ngo, 2020. The determinants of bank profitability: A cross-country analysis. *Central Bank Review* 20(2), 65-73.
- Liu, J. and S. Huang, 2020. An analysis of the impact of financial technology on the development of internet finance. *Financial Forum* 9(2), 126-132.
- Malhotra, P., and B. Singh, 2009. The impact of internet banking on bank performance and risk: The Indian experience. *Eurasian Journal of Business and Economics* 2(4), 43-62.
- Mateka, M., J. Gogo, and J. Omagwa, 2016. Effects of internet banking on financial performance of listed commercial banks in Kenya. *American Journal of Finance* 1(2), 53-57.
- Morufu, O., 2016. E-payments adoption and profitability performance of deposits money banks in Nigeria. *International Journal of Information Technology* 4(3), 56-68.
- Murat, A., and M. Isaac, 2019. Effect of internet banking on the performance of first bank Nigeria Plc Abuja. *The International Journal of Social Sciences and Humanities Invention* 6(8), 5559-5564.
- Ngango, A., M. Mbabazize, and J. Shukla, 2015. E-banking and performance of commercial banks in Rwanda a case of bank of Kigali. *European Journal of Accounting Auditing and Finance Research* 3(4), 25-57.

- Nicoletti, B., 2017. *The Future of FinTech. Integrating Finance and Technologies in Financial Services*. Cham: Springer International Publishing AG.
- Nimako, S. G., N. K. Gyamfi, and A. M. M. Wandaogou, 2013. Customer satisfaction with internet banking service quality in the Ghanaian banking Industry. *International Journal of Scientific and Technology Research* 2(7), 165-175.
- Nizam, F., H. J. Hwang, and N. Valaei, 2019. Measuring the effectiveness of E-wallet in Malaysia. *Big Data, Cloud Computing, Data Science and Engineering* 3(1), 59-69.
- Noah, A. M., A. O. Jagongo, and F. W. S. Ndede, 2019. Effect of internet banking on financial performance of tier one commercial banks in Kenya. *Journal Entrepreneurship and Organization Management* 8(1), 2-8.
- Nyabuti, R. N., N. U. Andrew, and M. Onwonga, 2023. Effect of digital lending on financial performance of commercial banks in Kisii County: Moderating role of government policies. *Reviewed Journal International of Financial Management* 4(1), 75-88.
- Odhiambo, A. A., and F. S. Memba, 2012. Credit cards and performance of commercial banks portfolio in Kenya. *International journal of Arts and Commerce* 1(6), 23-26.
- Onay, C., and E. Ozsoz, 2013. The impact of internet-banking on Brick and Mortar branches: The case of Turkey. *Journal of Financial Services Research* 44(2), 187-204.
- Oyewole, O. S., M. Abba, and J. G. El-Maude, 2013. E-banking and bank performance: evidence from Nigeria. *International Journal of Scientific Engineering and Technology* 2(8), 766-771.
- Rahman, M. M., 2007. Innovative technology and bank profitability: The Bangladesh experience. *Bangladesh Bank Working Paper No. 0803*.
- Razif, N. N. M., M. Misiran, H. Sapiri, and Z. M. Yusof, 2020. Perceived risk for acceptance of E-wallet platform in Malaysia among youth: Sem approach. *Management Research Journal* 9(1), 1-24.
- Schueffel, P., 2016. Taming the beast: A scientific definition of fintech. *Journal of Innovation Management* 4(4), 32-54.
- Sethi, P., 2020. Factors affecting customer satisfaction in online banking in Nepal. *Nepalese Journal of Finance* 7(2), 86-97.
- Shakya, A., 2016. Impact of online banking on customer satisfaction and firm performance in Nepalese commercial banks. *Nepalese Journal of Management* 3(1), 1-17.
- Stoica, O., S. Mehdian, and A. Sargu, 2015. The impact of internet banking on the performance of Romanian banks: DEA and PCA approach. *Procedia Economics and Finance* 20(1), 610-622.
- Vala, V., F. Vala, and N. Panchal, 2022. The role of digitalization in lending procedure: digital lending vs traditional lending. *International Journal of Management, Public Policy and Research* 1(1), 39-46.
- Vyas, R. K., M. Singh, and R. Yadav, 2008. The impact of capital adequacy requirements on performance of scheduled commercial banks. *Asia Pacific Business Review* 4(2), 74-81.

Chapter 15

Impact of e-banking on performance of Nepalese commercial banks

- Darbin Shrestha*

Abstract

This study examines the impact of e-banking on performance of Nepalese commercial banks. Bank performance is selected as the dependent variable. Likewise, mobile banking, internet banking, ATM banking, point of sale, digital wallet and credit card are selected as the independent variables. The primary source of data is used to assess the opinions of the respondents regarding the usages of financial technology in Nepalese commercial banks. The study is based on primary data with 158 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and impact of financial technology on the performance of Nepalese commercial banks.

The study showed that mobile banking has a positive effect on bank performance which means better the mobile banking services, higher would be the bank's performance. Likewise, internet banking has a positive impact on bank performance which indicates that better internet banking services leads to increase in the level of banking performance. Similarly, ATM banking has a positive effect on bank performance. It implies that better and efficient ATM services leads to increase in the level of banking performance. Moreover, POS banking services has a positive impact on bank performance. It indicates that better and availability of POS banking services leads to increase in the level of banking performance. Furthermore, digital wallet has a positive effect on bank performance which indicates that better and easy availability of digital wallet services leads to increase in the level of banking performance. In addition, credit card has a positive impact on bank performance. It implies that increase in the use of credit card leads to increase in the level of banking performance.

Keywords: bank performance, mobile banking, internet banking, ATM banking, POS banking, digital wallet banking, credit card banking

1. Introduction

A sound banking sector is essential for the growth of an economy. For the presence of sound banking sector, a strong infrastructure of financial technology is necessary which will be playing a role as catalyst for the development of secured banking environment. The banking industry in the world as well as in Nepal is highly competitive. To achieve edge over its competitors, a bank should focus on various entities that directly or indirectly affect the performance of the bank. One of the sector a bank should prioritize at present scenario is the financial technology or FinTech. FinTech, a new sector of the economy, competes with established financial practices by enhancing financial operations through innovation and technology. Innovation leads to continuous improvement in financial technology. FinTech refers to the new financial model involving technology as the carrier providing financial services such as mobile payments, financial management, cloud computing, as well as other emerging scientific and technological means (Schueffel, 2016). FinTech has revolutionized the way individuals and businesses manage their financial activities by offering more accessible, efficient, and user-friendly financial solutions. Fintech include electronic payment services including financing, financial advisers, virtual currencies, and bots. It seeks to provide new and ongoing financial services and products that improve financial inclusion, lower costs, and improve security aspects, all of which promote financial development and economic progress (Mention, 2019). Fintech is a hybrid market area that combines the financial services and technology industries.

Financial technology or Fintech contributes to the development and improvement of efficiency as well as increase the amount of revenue generation of the banks and financial institutions. After the use of Fintech by banks, the efficiency of banks has significantly improved (Ntwiga, 2020). Chavan

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(2013) stated that the internet and its rapid expansion and penetration has helped banking sector create various information delivery channels. Aduda and Kingoo (2012) found the relationship between e-banking and financial performance is positive and significant. In order to increase productivity in a variety of tasks, constant innovation and digitization are essential. Organizations may automate procedures, cut expenses, and raise overall performance indicators by adopting technology innovations and encouraging an innovative culture. Jote (2023) found that the financial performance of commercial banks is significantly and favorably impacted by financial innovations. Commercial banks can get a competitive edge in the banking sector by utilizing financial innovation. Customer retention and attraction, especially from the next or rising generations, will be greatly aided by increased digitalization that supports all preferred banking and payment methods. Commercial banks can get a competitive edge in the banking sector as long as they collaborate with fin-tech firms to provide clients additional digital banking services. They may make the most money after they please their customers, increase their market share, and get a competitive edge.

The applications of technology and internet banking have brought great changes in the banking industry. Agboola (2006) emphasized that banks have to invest in technology, modernize their systems to improve quality, efficiency and speed in delivering services; otherwise they may lose their positions in the competitive race with the rivals. Customer expectations are changing and shifting due to advances in technology. To satisfy those subtle needs, multichannel delivery model is applied and proven to be a success. Such a system employs a unified interface across all channels. On the other hand, devising technology-driven strategies that facilitate knowledge discovery and enhance the skill sets of employees is vital because the success of banking institutions and the realization of their objectives depend largely on human resources. Karimzadeh et al. (2014) found that expansion of e-banking has a significant positive association with the profitability measured in terms of ROA of Iranian banks. A study on the commercial banks operating in Bangladesh found out that banks that are adopting financial technology are performing well and the efficiency has improved with time (Titu and Rahman, 2007). Wachira et al. (2021) examined the effect of online financial services on Kenyan commercial banks' financial results and discovered a strong correlation between gross non-performing loans, client deposits, and the nation's commercial banks' performance. In order to achieve the best possible financial performance, the study suggests that commercial banks should work with fintech businesses to produce additional digital financial services on a constant basis.

Dzombo et al. (2017) discovered that the financial performance of commercial banks is significantly improved by branchless banking, including automated teller machines, phone, internet, and point of sale banking. Similarly, Noah et al. (2019) discovered that the profitability and efficiency of internet banking significantly and favorably affect productivity. The analysis found that because internet banking is available around-the-clock, it gives users a competitive edge and enhances the possibility that customers would stick with a brand. Beloke et al. (2021) investigated the impact of digital financial services and found digital transactions such as transfers and savings have positive and significant influence on the profitability of banks whereas, digital payments had negative but significant influence on the profitability of banks in Cameroon. Dinh et al. (2015) concluded that online banking has a beneficial effect on banks' productivity and profitability. The study also demonstrated how using online banking lowers operational expenses by reducing expenditures on fixed assets and operations at bank branches. Jefri et al. (2024) examined the impact of financial technology, or Fintech, on banking financial performance and focused on conventional banking companies listed on the Indonesia Stock Exchange (IDX) for the years 2013 through 2020. The study showed that fintech's ascent is a disruptive innovation for the banking industry. The demand for financial ease is strongly linked to this issue. Fintech has the ability to boost financial penetration and assist banks in addressing problems like the unbanked population. In addition, Simpson (2002) revealed that electronic banking is motivated

largely by the prospects of operating costs minimization and operating revenues maximization. The adoption of internet banking leads to cost reduction and hence likely to increase banks' profitability. The adoption of internet banking often leads to significant cost reductions, which in turn can enhance bank profitability. By minimizing the need for physical branches and reducing dependence on branch staff, internet banking cuts overhead costs such as rent, utilities, and maintenance, thereby contributing directly to cost efficiency. Furthermore, it automates routine transactions, making them faster and more efficient, allowing banks to handle a higher transaction volume at a lower cost per transaction.

In the context of Nepal, Dongol (2021) investigated how financial innovation affected Nepal's commercial banks' financial results. The study found that internet banking services are crucial to the banking industry's ability to delight clients and improve banks' financial performance. Joshi (2015) examined how the performance of commercial banks and consumer satisfaction were affected by online banking systems. The study found that Nepalese commercial banks' return on equity (ROE) and return on assets (ROA) are positively impacted by online banking characteristics such as usefulness, efficiency, security, responsiveness, and simplicity of use. Moreover, Shakya (2016) concluded that customer satisfaction in online banking has positive impact on the performance of the Nepalese commercial bank. The improvement in online banking determinants such as ease of use, usefulness, security, responsiveness, and efficiency leads to increase ROA and ROE of the commercial banks of Nepal. Availability of online banking services also improves customer satisfaction and attracts more clients without requiring additional staffing or infrastructure, thereby boosting customer retention at a reduced cost.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of e-banking on bank performance. Though there are above-mentioned empirical evidence in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to analyze the effect of e-banking on the performance of Nepalese commercial banks. Specifically, it analyze the relationship of mobile banking, internet banking, ATM banking, point of sale, digital wallet and credit card on the performance of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the primary data. The data were gathered from 158 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on mobile banking, internet banking, ATM banking, point of sale, digital wallet and credit card in the context of Nepalese commercial banks. The study is based on descriptive and causal comparative research designs.

The model

The model used in this study assumes that performance of banks depends upon financial technology used by the banks. The dependent variable selected for the study is bank performance. Similarly, the selected independent variables are mobile banking, internet banking, ATM banking, point of sale, digital wallet and credit card. Therefore, the model take the following form:

$$BP_{it} = \beta_0 + \beta_1 MB_{it} + \beta_2 IB_{it} + \beta_3 ATM_{it} + \beta_4 POS_{it} + \beta_5 DW_{it} + \beta_6 CC_{it} + e_{it}$$

Where,

BP = Bank performance

MB = Mobile banking

IB = Internet banking

ATM = Automated teller machine

POS = Point of sale

DW = Digital wallet

CC = Credit card

Bank performance was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 10 items and sample items include “Financial technology functions as a prime assistant in increasing the value of a bank”, “Improvement in bank’s performance is due to its internet banking service” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.885$).

Mobile banking was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Mobile banking helps to increase efficiency and effectiveness of work”, “Mobile banking helps to save time and is user friendly” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.802$).

Internet banking was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Internet banking saves time and money”, “Internet banking is more reliable and secured than traditional banking” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.754$).

ATM banking was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “ATM banking provides fastest means of cash withdrawal by reducing crowd in the banking hall and quick money withdrawal to the bank customers”, “ATM banking provides the customers with facility of withdrawing the money 24 hours a day, 7 days a week through their debit cards” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.704$).

POS banking was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “POS system maintains much needed accuracy by generating accurate reports in the banks”, “POS system in my bank helps to increase efficiency and expand payment capabilities” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.734$).

Digital wallet was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Nepalese commercial banks provide reliable and secure digital wallet services”, “Digital wallet services are user-friendly and easy to navigate” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.784$).

Credit card was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “The services provided through credit card runs without any hindrances”,

“Banks have partnered with various business firms and hospitals so that customers can use credit card easily” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.701$).

The following section describes the independent variables used in this study along with hypothesis formulation.

Mobile banking

The term “mobile banking” describes the process of accessing and carrying out financial transactions provided by a bank or other financial institution through mobile devices, such as smartphones and tablets. Kiplangat and Tibbs (2018) discovered that mobile banking significantly improved commercial banks’ financial performance. Increased operational effectiveness, lower transaction costs, and more customer satisfaction have resulted from the use of mobile banking services. Mobile banking has boosted transaction volumes, enhanced consumer engagement, and increased loyalty by giving users easy access to financial services (Bonface and Ambrose, 2015). Too et al. (2016) found that the relationship between mobile banking and financial performance is positive and significant. Anindyastri et al. (2022) indicated the relationship between mobile banking and financial performance of Islamic banks are positive and significant. Based on it, this study develops the following hypothesis:

H1: There is a positive relationship between mobile banking and bank performance.

Internet banking

The activities of bank which are performed electronically with the help of internet is called internet banking. It is also known as the online banking or web banking through which the customer of the bank can carry out different commercial activities where the necessity to visit bank’s branch is not necessary. According to Hernando (2007), internet banking helped reduce the operation costs of the banks. It indicated that internet banking was significant for the performance enhancement of Spanish banks. Hanafizadeh et al. (2014) mentioned that internet banking is growing significantly and people are adopting it easily because it provides convenience and fast transaction. Mateka et al. (2016) found that the loan book, client deposits, operating expenses, and bank earnings are all positively impacted by online banking. Banks may achieve greater performance metrics and satisfy changing consumer needs by embracing digital transformation and concentrating on improving the user experience. All things considered, a bank’s performance in the current digital era is largely dependent on the integration of internet banking. Kemunto and Kagiri (2018) concluded that internet banking has strong and positive relationship or impact on competitiveness in banking. Based on it, this study develops the following hypothesis:

H2: There is a positive relationship between internet banking and bank performance.

ATM banking

ATM stands for Automated Teller Machine is an electronic medium of banking where a customer can complete a simple transaction without the help of any bank representative using the debit or credit card provided by the bank. With time, ATMs have changed from being straightforward cash dispensers to multipurpose gadgets that provide a greater range of financial services (Driga and Isac, 2014). By eliminating the need for human tellers and physical branches, these devices not only save banks operating expenses but also offer convenience to consumers (Krizek, 2013). Additionally, by granting access to banking services in isolated or disadvantaged locations where traditional bank branches might not be available, ATMs significantly contribute to improving financial inclusion (Caskey & Knight, 2019). The impact of retail banking on the expansion and viability of Rwanda’s

commercial banks was investigated by Emmanuel & Mulyungi (2019). The study discovered that ATMs had an impact on Ecobank's expansion and viability. The study's conclusions stated that ATM services and Ecobank's expansion and sustainability are positively correlated. Mwai et al. (2018) also found that internet banking significantly affects Kenyan commercial banks' ability to grow financially. Based on it, this study develops the following hypothesis:

H3: There is a positive relationship between ATM banking and bank performance.

Point of sales banking

The use of POS terminals to enable financial transactions at retail outlets is known as Point of Sale Banking, or POS banking. Morufu (2016) demonstrated that the adoption of point-of-sale (POS) by banks has a favorable and noteworthy effect on the financial performance of commercial banks. Furthermore, POS banking enhances the financial performance of a bank by lowering operating expenses and improving liquidity management. By encouraging loyalty and retention among both retailers and customers, the integration of POS systems also improves the entire customer experience. Nworie and Okafor (2021) investigated the use of point of sale terminals in Nigerian banking. The study found that it helps to gain the trust and loyalty from customers and simultaneously increase market share as well as satisfy the customers. Nneka and Davison (2022) investigated the change in financial performance of Nigerian banks analyzing the data from 2005-2019 and obtained that the relationship is positive with point of sale terminals as the study found significant impact on return of assets. Ogunsuyi and Tejumade (2021) stated that due to the increase use of point of sale transactions, the sales volume in business firms have increased, reduction of time in payment is noticeable and income has risen up which has eventually positively impacted the bank and banking performance. Based on it, this study develops the following hypothesis:

H4: There is a positive relationship between POS banking and bank performance.

Digital wallet

Digital wallet adoption helps banks execute transactions more quickly and efficiently while cutting down on the operating expenses related to traditional banking practices. Financial institutions can improve their operational performance and liquidity management as a result of this efficiency. Wadesango and Magaya (2021) investigated the digital banking and its impact on financial performance of banks. The study concluded that the digital banking and increase in the use of digital wallet significantly increases the bank performance. Digital wallets are important for advancing financial inclusion because they give people who might not have traditional bank accounts access to financial services. Additionally, they help to lower transaction costs and advance cashless economies, which are especially advantageous in developing nations with sparse financial infrastructure (Ozili, 2018). Muhtasim et al. (2022) stated that the use of digital wallet has increased due to the increase in trust of customers on it, which has led to rise of transactions and in the end increased the revenue of banks and enhancement of financial performance. Based on it, this study develops the following hypothesis:

H5: There is a positive relationship between digital wallet and bank performance.

Credit cards

Banks and other financial organizations can offer credit cards, which are payment cards that enable the bearer to borrow money up to a pre-established credit limit in order to pay for products and services. Credit cards operate on a revolving credit system, which allows for ongoing borrowing within the credit limit as long as the cardholder repays a portion of the borrowed amount (Agarwal et al., 2015). With extra features like travel benefits, cash back, rewards programs, and fraud protection,

credit cards are more appealing to customers for both regular and major transactions (Mann, 2006). Credit cards have a favorable impact on bank performance through increased client engagement and fee-based revenue. However, this benefit is contingent upon the implementation of rigorous credit evaluations and efficient risk management techniques (Fischer & Hainz, 2017). Ashiru et al. (2023) concluded that credit and debit cards have positive and long run effect on bank performance. Mukulu et al. (2024) stated that the relationship between payment cards and financial performance of banks listed in Nairobi Securities Exchange is positive and significant. Based on it, this study develops the following hypothesis:

H6: The relationship between credit cards and bank performance is positive.

3. Results and discussion

Correlation analysis

Having indicated the descriptive statistics, Kendall's Tau correlation coefficients are computed and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 158 observations. The dependent variable is BP (Bank performance). The independent variables are MB (Mobile banking), IB (Internet banking), ATM (Automated teller machine), POS (Point of sales), DW (Digital wallet) and CC (Credit card).

Variables	Mean	SD	MB	IB	ATM	POS	DW	CC	BP
MB	4.220	0.615	1						
IB	4.011	0.571	0.462**	1					
ATM	3.855	0.657	0.273**	0.535**	1				
POS	3.877	0.485	0.333**	0.388**	0.325**	1			
DW	3.863	0.537	0.278**	0.257**	0.175**	0.186**	1		
CC	3.771	0.524	0.372**	0.387**	0.216**	0.304**	0.369**	1	
BP	4.102	0.537	0.437**	0.453**	0.290**	0.393**	0.413**	0.441**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 1 shows that mobile banking has a positive relationship with bank performance which means better the mobile banking services, higher would be the bank's performance. Likewise, internet banking has a positive relationship with bank performance which indicates that better internet banking services leads to increase in the level of banking performance. Similarly, there is positive relationship between ATM banking and bank performance. It implies that better and efficient ATM services leads to increase in the level of banking performance. Moreover, the relationship between POS banking services and bank performance is positive. It indicates that better and availability of POS banking services leads to increase in the level of banking performance. Furthermore, digital wallet has a positive relationship with bank performance which indicates that better and easy availability of digital wallet services leads to increase in the level of banking performance. In addition, credit card has a positive relationship with bank performance. It implies that increase in the use of credit card leads to increase in the level of banking performance.

Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 2. More specifically, it shows the regression results

of mobile banking, internet banking, ATM, POS, digital wallet and credit card on performance of Nepalese commercial banks.

Table 2

Regression result of mobile banking, internet banking, ATM, POS, digital wallet and credit card on performance of Nepalese commercial banks

The results are based on 158 observations by using linear regression model. The model is $BP_{it} = \beta_0 + \beta_1 MB_{it} + \beta_2 IB_{it} + \beta_3 ATM_{it} + \beta_4 POS_{it} + \beta_5 DW_{it} + \beta_6 CC_{it} + e_{it}$ where, the dependent variable is BP (Bank performance). The independent variables are MB (Mobile banking), IB (Internet banking), ATM (Automated teller machine), POS (Point of sales), DW (Digital wallet) and CC (Credit card).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		MB	IB	ATM	POS	DW	CC			
1	2.188 (8.529)**	0.454 (7.59)**						0.265	0.459	57.614
2	1.77 (7.528)**		0.581 (10.018)**					0.388	0.419	100.363
3	2.703 (11.909)**			0.363 (6.255)**				0.195	0.478	39.135
4	1.653 (5.906)**				0.633 (8.819)**			0.328	0.438	77.773
5	2.098 (7.838)**					0.520 (7.577)**		0.263	0.459	57.115
6	1.806 (7.184)**						0.609 (9.22)**	0.349	0.432	85.042
7	1.383 (5.407)**	0.213 (3.336)**	0.453 (6.661)**					0.425	0.405	58.995
8	1.350 (5.16)**	0.214 (3.341)**	0.42 (4.887)**	0.042 (0.633)				0.423	0.406	39.313
9	0.833 (2.984)**	0.166 (2.67)*	0.327 (3.844)**	0.002 (0.034)	0.323 (4.096)**			0.476	0.387	36.705
10	0.37 (1.296)	0.12 (2.014)*	0.301 (3.732)**	0.029 (0.466)	0.284 (3.78)**	0.266 (4.313)**		0.530	0.367	36.466
11	0.302 (1.069)	0.101 (1.702)	0.256 (3.125)**	0.019 (0.308)	0.246 (3.233)**	0.208 (3.162)**	0.176 (2.309)*	0.543	0.361	32.143

Notes:

- Figures in parenthesis are t-values
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Bank performance is dependent variable.

The result shows that the beta coefficients for mobile banking are positive with bank performance. It implies that mobile banking has a positive impact on bank performance. This finding is consistent with the findings of Kiplangat and Tibbs (2018). Similarly, the beta coefficients for internet banking are positive with bank performance. It implies that internet banking has positive relationship with bank performance. This finding is similar to the findings of Hanafizadeh et al. (2014). In addition, the beta coefficients for ATM banking are positive with bank performance. It implies that the ATM banking has positive impact on bank performance. This finding is consistent with the findings of Caskey & Knight (2019). Moreover, the beta coefficients for POS banking are positive with bank performance. It implies that the POS banking has positive relationship with bank performance. This finding is similar to the findings of Morufu (2016). Furthermore, the beta coefficients for digital wallet are positive with bank performance. It implies that the digital wallet has positive impact on bank performance. This finding is consistent with the findings of Wadesango and Magaya (2021). Similarly, the beta coefficients for credit card are positive with bank performance. It implies that credit card has positive relationship with bank performance. This finding is similar to the findings of Ashiru et al. (2023).

4. Summary and conclusion

Good technology and innovations are essential for firms to fulfill their objectives. The banking

industry has witnessed intense rivalry to offer clients higher-quality services. The current state of the banking industry is evolving in the direction of the creation of new innovative technologies as a result of an analysis is in the rise. The integration of financial technology principles, practices, guidelines, and execution tactics into banking services has grown in prominence and importance for all banks. Commercial banks are now required to provide electronic and internet-based customer service due to the highly dynamic and rapidly changing business environment in the financial industry as a result of the FinTech advancement.

This study attempts to examine the impact of e-banking on the performance of commercial banks in Nepal. The study is based on primary data gathered from 158 respondents.

The major conclusion of the study is that the adoption of digital banking channels, including mobile banking, internet banking, ATM banking, POS banking, digital wallet banking, and credit card banking, significantly enhances the performance of Nepalese commercial banks. These technologies have contributed to improving customer convenience, and overall performance. The adoption of diverse digital banking technologies is not only a competitive necessity but also a key driver for sustainable growth and improved performance in Nepalese commercial banks. The study also concludes that mobile banking followed by internet banking, and digital wallet are the most significant factor that impacts performance of Nepalese commercial banks.

References

- Aduda, J., and N. Kingoo, 2012. The relationship between electronic banking and financial performance among commercial banks in Kenya. *Journal of Finance and Investment Analysis* 1(3), 99–118.
- Agarwal, S., S. Chomsisengphet, N. Mahoney, and J. Stroebel, 2015. Regulating consumer financial products: Evidence from credit cards. *The Quarterly Journal of Economics* 130(1), 111–164.
- Agboola, A., 2006. Information and communication technology (ICT) in banking operations in Nigeria: An evaluation of recent experiences. *African Journal of Public Administration and Management* 25(2), 56–76.
- Anindyastri, R., W. D. Lestari, and M. Sholahuddin, 2022. The influence of financial technology (fintech) on the financial performance of Islamic banking (Study on Islamic banking listed on the Indonesia Stock Exchange period 2016–2020). *Benefit: Jurnal Manajemen dan Bisnis (Jurnal ini Sudah Migrasi)* 7(1), 80–92.
- Ashiru, O., G. Balogun, and O. Paseda, 2023. Financial innovation and bank financial performance: Evidence from Nigerian deposit money banks. *Research in Globalization* 6(2), 1001–1020.
- Beloke, N., E. Messomo, and S. Mbu, 2021. The influence of digital financial services on the financial performance of commercial banks in Cameroon. *European Scientific Journal* 17(1), 1857–7881.
- Bonface, R. M., and J. Ambrose, 2015. Mobile banking and financial performance of commercial banks in Kenya. *International Journal of Finance and Current Business Studies* 4(12), 16–31.
- Caskey, J. P., and B. Knight, 2019. Financial inclusion and the delivery of banking services through ATMs. *Economic Review* 104(4), 251–263.
- Chavan, J., 2013. Internet banking-benefits and challenges in an emerging economy. *International Journal of Research in Business Management* 1(1), 19–26.
- Dinh, V., U. Le, and P. Le, 2015. Measuring the impacts of internet banking to bank performance: Evidence from Vietnam. *Journal of Internet Banking and Commerce* 20(2), 103–108.
- Dongol, P., 2021. Financial innovation and its impact on financial performance of commercial banks in Nepal. *International Journal of Multidisciplinary Research and Explorer* 1(7), 49–55.
- Driga, I., and C. Isac, 2014. E-banking services—features, challenges and benefits. *Annals of the University of*

- Petrosani. Economics* 14(1), 49-58.
- Dzombo, G. K., M. K. James, and M. James, 2017. The effect of branchless banking strategy on the financial performance of commercial banks in Kenya. *International Journal of Financial Research* 8(4), 167-183.
- Emmanuel, R., and P. Mulyungi, 2019. The effect of ATM on the growth sustainability of commercial banks in Rwanda; A case study of Ecobank Rwanda. *International Journal of Science and Research* 8(11), 1215-1217.
- Fischer, M., and C. Hainz, 2017. The impact of credit card usage on bank profitability. *Journal of Banking & Finance* 79(1), 68-81.
- Hanafizadeh, P., B. W. Keating, and H. R. Khedmatgozar, 2014. A systematic review of internet banking adoption. *Telematics and Informatics* 31(3), 492-510.
- Hernando, I., and M. J. Nieto, 2007. Is the internet delivery channel changing banks' performance? The case of Spanish banks. *Journal of Banking & Finance* 31(4), 1083-1099.
- Jefri, R., N. M. Surianto, W. K. E. Putra, and M. Novitasari, 2024. Impact of financial technology on the financial performance of conventional banks in Indonesia. *Jurnal Ilmiah Akuntansi* 9(1), 273- 291.
- Joshi, R., 2015. Impact of online banking on customer satisfaction of Nepalese commercial banks. *Nepalese Journal of Management* 2(2), 36-45.
- Jote, G. G., 2023. Financial innovation and its effects on bank financial performance: Evidence from Ethiopian commercial banks. *African Journal of Commercial Studies* 3(1), 46-66.
- Karimzadeh, D. S. D., D. M. Emadzadeh, and J. Shateri, 2014. The effects of electronic banking expansion on profitability of a commercial bank (Sepah bank of Iran). *Indian Journal of Scientific Research* 4(6), 305-312.
- Kemunto, E. R., and A. Kagiri, 2018. Effect of implementation of fintech strategies on competitiveness in the banking sector in Kenya: A case of KCB Bank Kenya. *European Journal of Business and Strategic Management* 3(3), 29-40.
- Kiplangat, K. D., and C. Tibbs, 2018. Financial innovations and financial performance of commercial banks. *International Journal of Innovative Research and Development* 7(5), 36-41.
- Krizek, K. J., 2013. The influence of ATM banking on the growth of financial services. *Journal of Financial Services Research* 43(3), 305-325.
- Mann, R. J., 2006. Credit cards, consumer credit, and bankruptcy. *U of Texas Law and Economics Research Paper No. 44*.
- Mateka, M., J. Gogo, and J. Omagwa, 2016. Effects of internet banking on financial performance of listed commercial banks in Kenya. *American Journal of Finance* 1(2), 53-71.
- Mention, A. L., 2019. The future of fintech. *Research-Technology Management* 62(4), 59-63.
- Morufu, O., 2016. E-payments adoption and profitability performance of deposits money banks in Nigeria. *International Journal of Information Technology* 4(3), 56-68.
- Muhtasim, D. A., S. Y. Tan, M. A. Hassan, M. I. Pavel, and S. Susmit, 2022. Customer satisfaction with digital wallet services: an analysis of security factors. *International Journal of Advanced Computer Science and Applications* 13(1), 195-206.
- Mukulu, K. S., J. Matanda, and H. Otinga, 2024. Payment cards and financial performance of commercial banks listed at Nairobi Securities Exchange in Kenya. *International Research Journal of Economics and Finance* 6(1), 23-35.
- Mwai, A., F. S. Memba, and A. Njeru, 2018. The relationship between ATM banking and financial deepening of commercial banks in Kenya. *International Journal of Economics, Commerce and Management* 6(12), 496- 514.

- Nneka, M., and U. Davison, 2022. Impact of automated teller machine and point of sale usage on financial performance of deposit money banks in Nigeria. *Multidisciplinary Journal of Management Sciences* 4(2), 1-14.
- Noah, A. M., A. O. Jagongo, and F. W. S. Ndede, 2019. Effect of internet banking on financial performance of tier one commercial banks in Kenya. *Journal Entrepreneurship and Organization Management* 8(1), 2-8.
- Ntwiga, D. B., 2020. Fintech and banks collaboration: Does it influence efficiency in the banking sector? *KBA Centre for Research on Financial Markets and Policy Working Paper Series No. 40*.
- Nworie, G. O., and T. G. Okafor, 2021. A literature review on the challenges of the use of point of sale (POS) Terminals in the Nigerian Banking System. *International Journal of Academic Information Systems Research* 7(2), 1-14.
- Ogunsuyi, O., and S. O. Tejumade, 2021. Point of sale terminal services and the performance of small and medium-sized enterprises in Nigeria. *International Journal of Social and Management Studies* 2(4), 114-122.
- Ozili, P. K., 2018. Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review* 18(4), 329-340.
- Schueffel, P., 2016. Taming the beast: A scientific definition of fintech. *Journal of Innovation Management* 4(4), 32-54.
- Shakya, A., 2016. Impact of online banking on customer satisfaction and firm performance in Nepalese commercial banks. *Nepalese Journal of Management* 3(1), 32-44.
- Simpson, J., 2002. The impact of the internet in banking: observations and evidence from developed and emerging markets. *Telematics and Informatics* 19(1), 315-330.
- Titu, M. A. S., & M. A. Rahman, 2013. Online banking system-its application in some selected private commercial banks in Bangladesh. *IOSR Journal of Business and Management* 12(1), 37-44.
- Too, V. K., C. Ayuma, and K. Ambrose, 2016. Effects of mobile banking on the financial performance of commercial banks in Kapsabet (Kenya): A case of selected banks in Kapsabet town. *IOSR Journal of Business and Management* 18(10), 37-48.
- Wachira, V. K., F. Kalui, and J. Gathii, 2021. Digital financial innovation services and their impact on the performance of Commercial Banks in Kenya. *European Journal of Economic and Financial Research* 5(3), 19-31.
- Wadesango, N., and B. Magaya, 2021. Literature review on the impact of digital banking services on performance of commercial banks. *African Journal of Development Studies* 11(2), 149-156.

Part V:

Capital Market Development

Chapter 16

Impact of credit risk management on stock returns in Nepalese commercial banks

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Abstract

This study examines the impact of credit risk management on stock returns in Nepalese commercial banks. Earnings per share and market price per share are the selected dependent variables. The selected independent variables are non-performing loans, capital adequacy ratio, cost efficiency ratio, liquidity ratio, bank size and cash reserve ratio. The study is based on secondary data of 15 commercial banks with 120 observations for the study period from 2015/16 to 2022/23. The data were collected from annual report and audited financial statement of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of credit risk management on stock returns in Nepalese commercial banks.

The results showed that capital adequacy ratio has a positive effect of earnings per share and market price per share. It indicates that increase in capital adequacy ratio leads to increase in earnings per share and market price per share. Likewise, there is a negative effect of cost efficiency ratio and earnings per share and market price per share. It indicates that increase in cost efficiency ratio leads to decrease in earnings per share and market price per share. In contrast, liquidity ratio has a positive effect of earnings per share and market price per share. It indicates that higher the liquidity ratio, higher would be the earnings per share and market price per share. In addition, cash reserve ratio has a positive effect of earnings per share and market price per share. It indicates that increase in cash reserve ratio leads to increase in earnings per share and market price per share. Moreover, bank size has a positive effect of earnings per share and market price per share. It indicates that larger the bank size, higher would be the earnings per share and market price per share.

Keywords: market price per share, earning per share, non-performing loan, capital adequacy ratio, cash reserve ratio, cost efficiency ratio, bank size, liquidity

1. Introduction

Credit risk refers to the potential loss banks may face due to delayed or missed loan repayments (Buchory, 2021). This risk manifests when a borrower defaults on their debt obligations, leading to a higher probability of bankruptcy for the bank, which threatens the safety of depositors' funds. Consequently, effective credit risk management has become a critical component of banking operations with its importance amplified by its impact on a bank's sustainability, growth, and overall financial performance (Afolabi et al., 2021). Effective credit risk management is crucial for enhancing a bank's stock returns, especially in competitive markets. By minimizing non-performing loans (NPLs) through careful assessment of borrowers' creditworthiness, banks can reduce the likelihood of loan defaults, leading to more consistent interest income and fewer losses. This strengthens profitability, a key factor driving stock returns. Additionally, efficient credit risk management allows banks to allocate capital more strategically, focusing on loans and investments with the best risk-adjusted returns. This not only improves financial performance but also boosts investor confidence, ultimately supporting higher stock prices. Ekinci and Poyraz (2019) suggested that robust company governance and sound enterprise practices are fundamental for the long-term stability and sustainability of any organization. These practices encompass various aspects, including capital adequacy and liquidity management, which are critical in maintaining financial health and resilience against market fluctuations. By embedding robust governance and sound enterprise practices in areas like capital adequacy and liquidity management,

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firm can enhance their financial stability, build stakeholder trust, and achieve long-term success. Technological advancements in banking are closely linked to improved credit risk management, which enhances decision-making and reduces management costs. Stock markets are pivotal in directing both domestic and international savings into productive investments, thereby supporting economic growth and capital formation (EI Nader and Alraimony, 2012). They play a vital role in price discovery through the interplay of supply and demand, which reflects the true value of companies and aids investors in making informed decisions. By offering diverse investment options, stock markets facilitate risk diversification, which mitigates the adverse effects of poor performance in any single investment. They are integral to a country's economic infrastructure, enabling efficient resource allocation, supporting capital formation, and fostering economic stability and growth (Qing and Kusairi, 2019).

Stock markets help in the efficient allocation of resources by directing capital to the most promising and productive investments. This efficient allocation supports the growth of companies that contribute to innovation, job creation, and overall economic development. Stock markets play a critical role in the functioning of modern economies by serving as platforms where savings are channeled into productive investments. This process supports economic growth and capital formation, both of which are essential for the long-term prosperity of a nation. By enabling companies to raise capital and manage risks, stock markets contribute to the overall stability and resilience of the financial system, which is essential for sustained economic growth. Stock markets are essential in channeling savings into productive investments, facilitating capital formation, and supporting economic growth. By doing so, they not only contribute to the development of individual businesses but also to the broader economic health of a country or region. The performance of the banking industry significantly impacts public trust, making it crucial for banks to maintain high operational standards (Safitri and Oktavia, 2022). Inefficient bank operations can lead to financial crises, adversely affecting economic growth (Nuhui et al., 2017). Banks are vital financial intermediaries that channel funds from surplus to deficit areas. According to Yusuf et al. (2019), a bank's profitability reflects its management efficiency, ensuring returns for investors and repayments for creditors. Brastama and Yadnya (2020) revealed that non-performing loans (NPLs) negatively impact return on assets (ROA) and stock prices, with ROA mediating the relationship between NPLs and stock prices. Abor (2005) found a positive relationship between short-term debt to total assets and return on equity (ROE), while long-term debt to total assets negatively affects ROE. Additionally, a positive association between total debt to total assets and profitability was observed. Narula and Singla (2014) reported that increased net profits are associated with higher non-performing loans. However, Kaaya and Pastory (2013) noted that non-performing loans lead to higher loan loss provisions, diminishing bank earnings. Financial performance measures the efficiency of resource utilization to maximize profits. Sufficient capital is essential to cover both anticipated and unforeseen losses. Bruni et al. (2014) emphasized the importance of credit risk assessment in developing strategies to prevent and manage defaults. A solid capital adequacy ratio can protect banks from potential threats to their survival (Balango and Rao, 2017). Banks must maintain adequate liquidity to handle client withdrawals and other financial commitments (Olagunju et al., 2012). Insufficient liquidity can reduce profitability and increase the risk of bank collapse. Effective liquidity management involves strategic funding, risk management processes, and contingency planning. The liquidity of assets affects how quickly and cost-effectively they can be converted into cash.

By providing a platform for the buying and selling of securities, stock markets ensure liquidity, enabling investors to enter and exit investments with ease. This liquidity is crucial for maintaining investor confidence and sustaining continuous capital flow into productive areas. Hallunovi and Berdo (2018) assessed the relationship between credit risk management and profitability in commercial banks in Albania. The study found that capital adequacy has a positive relationship with return on assets and return on equity. Parvin et al. (2019) investigated how liquidity and bank size affect bank profitability

using secondary data from the annual reports of the banks were analyzed collected from year 2011 to 2015 of the seven commercial banks. The study showed that loan-to-asset ratio and bank size have a positive relationship with return on asset (ROA), which is a measure of profitability. According to the analysis, the size of the banks had no substantial influence on their profitability. The findings also revealed that the deposit-to-asset ratio had a negative influence on the return on assets (ROA) of the selected banks. In addition, the study revealed that liquidity had no meaningful impact on bank profitability. Abidi and Lodhi (2015) examined the effect of changes in cash reserve requirement on banks profitability. The study indicated that CRR considered as a measure for reserve requirement has a substantial inverse association with banks' financial performance, which is measured by ROA and ROE, and hence it Changes in CRR are expected to have an opposite influence on bank profitability. As SBP increases the CRR, banks' ROE and ROA will fall, and vice versa. Maccarthy (2016) examined the effect of cash reserve ratio on the financial performance of banks and their level of engagement in corporate social responsibility. The study found that cash reserve ratio positively related to the financial performance of commercial banks, but it negatively relates to banks' level of engagement in corporate social responsibility. Similarly, cash reserve ratio significantly and strongly determined financial performance of commercial banks in terms of return on investment.

In the context of Nepal, Manandhar (2015) found that credit risk has negative relationship with return on equity, capital adequacy ratio, gross domestic product and bank branch. Chhetri (2021) examined the effect of credit risk management on financial performance of Nepalese commercial banks. The study found that non-performing loan (NPLR) has a negative and statistically significant impact on financial performance (ROA). According to Bhattarai (2014), a bank's performance is positively impacted by its cost per loan asset while it is negatively impacted by its non-performing loan ratio.

The above discussion shows that the studies related to the impact of credit risk management on stock returns in Nepalese commercial banks. Though there are above-mentioned empirical evidence in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The main purpose of the study is to analyze the impact of credit risk management on stock returns in the context of Nepalese insurance companies. Specifically, it examines the relationship of non-performing loan, capital adequacy ratio, cost efficiency ratio, liquidity ratio, bank size and cash reserve ratio with earnings per share and market price per share in the context of Nepalese commercial banks.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results and the final sections draws conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 15 Nepalese commercial banks from 2015/16 to 2022/23, leading to a total of 120 observations. The main sources of data collected from the annual report and audited financial statement of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of commercial banks	Study period	Observations
1	Rastriya Banijya Bank Limited	2015/16 – 2022/23	8
2	Nepal Bank Limited	2015/16 – 2022/23	8
3	Agriculture Development Bank Limited	2015/16 – 2022/23	8
4	Himalayan Bank Limited	2015/16 – 2022/23	8
5	Everest Bank Limited	2015/16 – 2022/23	8
6	NMB Bank Limited	2015/16 – 2022/23	8
7	Standard Chartered Bank Nepal Limited	2015/16 – 2022/23	8
8	Nepal SBI Bank Limited	2015/16 – 2022/23	8
9	Nabil Bank Limited	2015/16 – 2022/23	8
10	Machhapuchchhre Bank Limited	2015/16 – 2022/23	8
11	Sanima Bank Limited	2015/16 – 2022/23	8
12	NIC Asia Bank Limited	2015/16 – 2022/23	8
13	Prime Commercial Bank Limited	2015/16 – 2022/23	8
14	Siddhartha Bank Limited	2015/16 – 2022/23	8
15	Nepal Investment Bank Limited	2015/16 – 2022/23	8
Total number of observations			120

Thus, the study is based on the 120 observations.

The model

The model used in this study assumes that bank's stock returns depends on credit risk management. The dependent variables selected for the study are earnings per share and market price per share. Similarly, the selected independent variables in this study are non-performing loans, capital adequacy ratio, cost efficiency ratio, liquidity ratio, bank size and cash reserve ratio. Therefore, the models take the following forms:

$$EPS_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 CER_{it} + \beta_4 LR_{it} + \beta_5 BS_{it} + \beta_6 CRR_{it} + e_{it}$$

$$MPPS_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 CER_{it} + \beta_4 LR_{it} + \beta_5 BS_{it} + \beta_6 CRR_{it} + e_{it}$$

Where,

EPS = Earnings per share as measured by the ratio of total net income divided to total number of outstanding shares, in Rs.

MPPS = Market price per share as measured by the average price of share in the market, in Rs.

NPL = Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage.

CAR = Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage.

CER = Cost efficiency ratio as measured by the ratio of operating expenses to operating income, in percentage.

LR = Liquidity ratio as measured by the ratio of total loan to total deposit, in percentage.

BS = Bank size as measured by total assets, Rs. in billions.

CRR= Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage.

The following section describes the independent variables used in this study along with hypothesis formulation.

Non-performing loan

Non-performing loan defines as the amount of borrowed money that the debtor has failed to pay the scheduled payments for about ninety days. Shittu and Abdulkadir (2023) used operating efficiency as a mediating variable to investigate the impact of non-performing loans on the profitability of state-owned commercial banks. The study showed that non-performing loan has a negative and significant impact on profitability in presence of the operating efficiency. Adebisi and Matthew (2015) reported negative impact of bad loans on bank performance and ROA. Uddin (2022) investigated how non-performing loans affect the gainfulness of state-owned commercialized banks, using performing efficiency as a mediating variable and found that NPL negatively and significantly impact profitability in presence of operating efficiency. Based on it, this study develops the following hypothesis:

H₁: There is a negative relationship between non-performing loan and stock returns.

Capital adequacy ratio

Capital adequacy ratio is used as a measure of financial health, performance and stability. Alshatti (2016) found that capital adequacy, capital levels, and leverage all positively affect bank profitability. Similarly, Nguyen (2020) discovered that bank capital sufficiency improves return on assets for small-sized banks but has no meaningful influence on profitability for large-sized banks in Vietnam. Elshaday (2018) identified positive and statistically significant impact of CAR and bank size on return on equity. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between capital adequacy ratio and stock returns of bank.

Cost efficiency ratio

Cost efficiency ratio measure the efficiency of banking operations is the ratio operational costs against total income. Anggraeni et al. (2022) revealed that operational expenses ratio (OER) has a significant negative impact on both profitability and capital. Das and Uppal (2021) argued that operating cost has negative and statistically significant impact on profitability. Similarly, Rekik and Kalai (2018) found that cost efficiency has little but negative impact on profitability and profit efficiency. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between cost efficiency ratio and bank stock returns.

Liquidity ratio

Liquidity risk is one sort of risk that banks face when they keep fewer liquid assets. Margolis (2003) examined that there is a positive and significant relationship between liquidity and bank profitability. Begum et al. (2022) revealed liquidity has a significantly positive effect on profitability. Al-Husainy and Jadah (2021) analyzed that liquidity risk has a positive significant association with bank profitability. Likewise, Wuave et al. (2020) discovered that the liquidity ratio (LQR) has a positive and significant impact on financial performance. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between liquidity and bank stock returns.

Bank size

Larger banks face more risks from information asymmetry. Similarly, Obim et al. (2020) revealed a significant relationship between bank size and bank profitability, explaining that with the larger pool of capital, banks can make better investment and avoid bankruptcy cost. Ahmed (2022) revealed that total assets and number of employees have a positive and significant relationship with return on assets. Irawati and Maksum (2018) observed a significant positive effect of firm size on ROA. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between bank size and stock returns of bank.

Cash reserve ratio

Cash reserve ratio is one of the monetary policy tools used by the central bank to control money supply in the economy. It is measured as the ratio of reserve required to bank deposits, in percentage. Wuave et al. (2020) revealed that cash reserve ratio is negatively associated with bank profitability in terms of ROA and ROE. This means the bank's profitability declined due to the increase in the cash reserve ratio. Osakwe and Nwakaego (2022) examined the effect of central bank of Nigeria regulation on the performance of deposit money banks and found that the cash reserve ratio has insignificant negative relationship with profitability of deposit money banks in Nigeria. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between cash reserve ratio and stock returns.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2015/16 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 15 Nepalese commercial banks for the study period of 2015/16 to 2022/23. The dependent variables are EPS (Earnings per share as measured by the ratio of net income to total number of outstanding shares, in rupee) and MPPS (Market price per share as measured by the multiplication of P/E ratio to earnings per share, in Rs.). The independent variables are NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CER (Cost efficiency ratio as measured by the ratio of tier 1 capital + tier 2 capital to weighted assets, in percentage), LR (Liquidity ratio measured as ratio of total loan to total deposit), BS (Bank size as measured by total assets, Rs. in billions) and CRR (Cash reserve ratio measured as ratio of reserve required to bank deposits, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
EPS	5.30	62.00	27.17	10.91
MPPS	0.00	3600.00	553.80	549.66
CAR	9.60	22.99	14.13	2.39
NPL	0.01	5.12	1.56	1.36
CER	20.35	71.57	43.09	9.63
LR	2.89	88.62	21.10	17.51
CRR	3.00	6.00	4.50	1.22
BSIZE	29.38	394.02	135.72	77.76

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 15 Nepalese commercial banks for the study period of 2015/16 to 2022/23. This table shows the descriptive statistics of dependent and independent variables of 15 Nepalese commercial banks for the study period of 2015/16 to 2022/23. The dependent variables are EPS (Earnings per share as measured by the ratio of net income to total number of outstanding shares, in Rs.) and MPPS (Market price per share as measured by the multiplication of P/E ratio to earnings per share, in Rs.). The independent variables are NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CER (Cost efficiency ratio as measured by the ratio of tier 1 capital + tier 2 capital to weighted assets, in percentage), LR (Liquidity ratio measured as ratio of total loan to total deposit), BS (Bank size as measured by total assets, Rs. in billions) and CRR (Cash reserve ratio measured as ratio of reserve required to bank deposits, in percentage).

Variables	EPS	MPPS	CAR	NPL	CER	LR	CRR	BSIZE
EPS	1							
MPPS	0.462**	1						
CAR	0.139	0.215*	1					
NPL	0.192*	-0.251**	-0.056	1				
CER	-0.364**	-0.414**	-0.149	0.181*	1			
LR	0.410**	0.190*	0.083	0.346**	-0.119	1		
CRR	0.343**	0.329**	0.023	-0.021	-0.404**	0.027	1	
BSIZE	0.452**	0.078	-0.026	0.172	-0.006	0.132	0.096	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that capital adequacy ratio has a positive relationship with earnings per share. It indicates that increase in capital adequacy ratio leads to increase in earnings per share. Similarly, there is a positive relationship between non-performing loan and earnings per share. It indicates that increase in non-performing loan leads to increase in earnings per share. Likewise, there is a negative relationship between cost efficiency ratio and earnings per share. It indicates that increase in cost efficiency ratio leads to decrease in earnings per share. In contrast, liquidity ratio has a positive relationship with earnings per share. It indicates that higher the liquidity ratio, higher would be the earnings per share. In addition, cash reserve ratio has a positive relationship with earnings per share. It indicates that increase in cash reserve ratio leads to increase in earnings per share. Moreover, bank size has a positive relationship with earnings per share. It indicates that larger the bank size, higher would be the earnings per share.

On the other hand, the result also shows that capital adequacy ratio has a positive relationship with market price per share. It indicates that increase in capital adequacy ratio leads to increase in market price per share. Similarly, there is a negative relationship between non-performing loan ratio and market price per share. It indicates that increase in non-performing loan ratio leads to decrease in market price per share. Likewise, there is a negative relationship between cost efficiency ratio and market price per share. It indicates that increase in cost efficiency ratio leads to decrease in market price per share. In contrast, liquidity ratio has a positive relationship with market price per share. It indicates that higher the liquidity ratio, higher would be the market price per share. In addition, cash reserve ratio has a positive relationship with market price per share. It indicates that increase in cash reserve ratio

leads to increase in market price per share. Moreover, bank size has a positive relationship with market price per share. It indicates that larger the bank size, higher would be the market price per share.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4 and 5. More specifically, Table 4 shows the regression results of long non-performing loan, capital adequacy ratio, cost efficiency ratio, liquidity ratio, bank size and cash reserve ratio with earnings per share of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, non-performing loan, cost efficiency ratio, liquidity ratio, cash reserve ratio and bank size on earnings per share

The results are based on panel data of 15 commercial banks with 120 observations for the period of 2015/16 to 2022/23 by using the linear regression model and the model is $EPS = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 CER_{it} + \beta_4 LR_{it} + \beta_5 BS_{it} + \beta_6 CRR_{it} + e_{it}$ where, the dependent variable is EPS (Earnings per share as measured by the ratio of net income to total number of outstanding shares, in Rs.). The independent variables are NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CER (Cost efficiency ratio as measured by the ratio of tier 1 capital + tier 2 capital to weighted assets, in percentage), LR (Liquidity ratio measured as ratio of total loan to total deposit), BS (Bank size as measured by total assets, Rs. in billions) and CRR (Cash reserve ratio measured as ratio of reserve required to bank deposits, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		NPL	CAR	CER	LR	BS	CRR			
1	24.780 (16.561)**	1.533 (2.122)*						0.029	10.755	4.503
2	18.244 (3.068)**		0.632 (1.523)					0.011	10.852	2.320
3	44.957 (10.493)**			-0.413 (4.252)**				0.126	10.204	18.079
4	21.784 (15.212)**				0.256 (4.885)**			0.161	9.994	23.863
5	18.567 (10.312)**					0.063 (5.505)**		0.198	9.775	30.302
6	13.497 (3.771)**						3.040 (3.961)**	0.110	10.295	15.691
7	13.497 (3.771)**	1.600 (2.229)*	0.683 (1.672)					0.043	10.674	3.683
8	37.194 (5.114)**	2.153 (3.209)**	0.431 (1.135)	-0.452 (4.711)**				0.190	9.821	10.298
9	33.467 (4.786)**	1.201 (1.741)	0.321 (0.884)	-0.390 (4.197)**	0.194 (3.636)**			0.267	9.342	11.842
10	25.769 (4.050)**	0.731 (1.181)	0.371 (1.152)	-0.377 (4.573)**	0.174 (3.661)**	0.056 (5.624)**		0.421	8.301	18.323
11	13.792 (1.791)	0.641 (1.060)	0.398 (1.267)	-0.283 (3.209)**	0.180 (3.888)**	0.054 (5.486)**	1.747 (2.627)*	0.450	8.094	17.210

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Earnings per share is the dependent variable.

Table 4 shows that the beta coefficients for non-performing loan are positive with earnings per share. It indicates that non-performing loan has a positive impact on earnings per share. This finding is similar to the findings of Shittu and Abdulkadir (2023). However, the beta coefficients for capital adequacy ratio are positive with earnings per share. It indicates that capital adequacy loan ratio has a positive impact on earnings per share. This finding is consistent with the findings of Alshatti (2016). Moreover, the beta coefficients for cost efficiency ratio are negative with earning per share. It indicates

that cost efficiency ratio has a negative impact on earnings per share. This finding is similar to the findings of Anggraeni et al. (2022). In addition, the beta coefficients for liquidity ratio are positive with earnings per share. It indicates that liquidity ratio has a positive impact on earnings per share. This finding supports the findings of Elshaday (2018). Further, the beta coefficients for bank size are positive with earnings per share. It indicates that bank size has a positive impact on earnings per share. This finding is similar to the findings of Maina and Kamau (2019). Moreover, the beta coefficients for cash reserve ratio are positive with earnings per share. It indicates that cash reserve ratio has a positive impact on earnings per share. This finding is consistent with the findings of Maccarthy (2016).

Table 5 shows the estimated regression results of non-performing loans, cost efficiency ratio, capital adequacy ratio, liquidity ratio, bank size and cash reserve ratio on market price per share.

Table 5

Estimated regression results of capital adequacy ratio, non-performing loan, cost efficiency ratio, liquidity ratio, cash reserve ratio and bank size on market price per share

The results are based on panel data of 15 commercial banks with 120 observations for the period of 2015/16 to 2022/23 by using the linear regression model and the model is $MPPS = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 CER_{it} + \beta_4 LR_{it} + \beta_5 BS_{it} + \beta_6 CRR_{it} + e_{it}$ where, the dependent variable is MPPS (Market price per share as measured by the multiplication of P/E ratio to earnings per share, in Rs.). The independent variables are NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CER (Cost efficiency ratio as measured by the ratio of tier 1 capital + tier 2 capital to weighted assets, in percentage), LR (Liquidity ratio measured as ratio of total loan to total deposit), BS (Bank size as measured by total assets, Rs. in billions) and CRR (Cash reserve ratio measured as ratio of reserve required to bank deposits, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		NPL	CAR	CER	LR	BS	CRR			
1	712.060 (9.581)** -143.470 (0.486)	-101.237 (2.822)**						0.055	534.254	7.962
2			49.339 (2.394)*					0.038	539.047	5.732
3	1571.339 (7.449)**			-23.613 (4.942)**				0.164	502.435	24.421
4	428.045 (5.513)**				5.960 (2.101)*			0.028	541.938	4.415
5	428.045 (5.513)**					0.551 (0.850)		0.002	550.303	0.722
6	-107.893 (0.595)						147.044 (3.785)**	0.101	521.252	14.324
7	51.387 (0.173)	-96.668 (2.739)*	46.244 (2.301)*					0.088	524.786	6.774
8	1056.722 (2.914)**	-71.589 (2.140)*	34.811 (1.838)	-20.490 (4.284)**				0.206	489.732	11.302
9	915.940 (2.565)*	-107.572 (3.053)**	30.636 (1.654)	-18.137 (3.825)**	7.329 (2.690)*			0.247	477.074	10.741
10	820.690 (2.249)*	-113.388 (3.196)**	31.263 (1.691)	-17.986 (3.800)**	7.082 (2.598)*	0.694 (1.213)		0.250	476.098	8.923
11	160.965 (0.364)	-118.359 (3.407)**	32.761 (1.812)	-12.777 (2.521)*	7.438 (2.787)**	0.557 (0.992)	96.212 (2.517)*	0.283	465.331	8.840

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Market price per share is the dependent variable.

Table 5 shows that the beta coefficients for non-performing loan are negative with market price per share. It indicates that non-performing loan has a negative impact on market price per share. This finding is similar to the findings of Adebisi and Matthew (2015). However, the beta coefficients for capital adequacy ratio are positive with market price per share. It indicates that capital adequacy

loan ratio has a positive impact on market price per share. This finding is consistent with the findings of Nguyen (2020). Moreover, the beta coefficients for cost efficiency ratio are negative with market price per share. It indicates that cost efficiency ratio has a negative impact on market price per share. This finding is similar to the findings of Das and Uppal (2021). In addition, the beta coefficients for liquidity ratio are positive with market price per share. It indicates that liquidity ratio has a positive impact on market price per share. This finding is consistent with the findings of Wuave et al. (2020). Further, the beta coefficients for bank size are positive with market price per share. It indicates that bank size has a positive impact on market price per share. This finding is similar to the findings of Ahmed (2022). Moreover, the beta coefficients for cash reserve ratio are positive with market price per share. It indicates that cash reserve ratio has a positive impact on market price per share. This finding contradicts with the findings of Osakwe and Nwakaego (2022).

4. Summary and conclusion

An effective credit risk management plays a pivotal role in increase bank's stock return in competitive markets, which is essential for growth and expansion of bank. With a balanced credit risk management, the bank can minimize different operational and non-operational risks. This allows the bank to increase earnings per share and market price per share.

This study attempts to analyze the impact of credit risk management on stock returns in the context of Nepalese commercial banks. The study is based on secondary data of 15 commercial banks with 120 observations for the study period from 2015/16 to 2022/23.

The major conclusion of this study is that higher non-performing loan, capital adequacy ratio, liquidity ratio, bank size and cash reserve ratio, higher would be the bank earnings per share. However, higher the cost efficiency ratio, lower would be the earnings per share. The study also concludes that earnings per share and market price per share are the major determinants of stock returns in Nepalese commercial banks. The result shows that higher non-performing loan and cost efficiency ratio, lower would be the market price per share. However, higher the capital adequacy ratio, liquidity ratio, bank size and cash reserve ratio, higher would be the market price per share in the context of Nepalese commercial banks.

References

- Abidi, F. S., and S. Lodhi, 2015. Impact of changes in reserve requirement on banks profitability: A case of commercial banks in Pakistan. *Impact Factor 3.582 Case Studies Journal* 4(11), 20- 28.
- Abor, J., 2005. The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. *The Journal of Risk Finance* 6(5), 438-447.
- Adebisi, J. F., and O. B. Matthew, 2015. Impact of non-performing loans on firm profitability: A Focus on the Nigerian banking industry. *American Research journal of Business and Management* 1(4), 1-7.
- Afolabi, M. A., S. S. Opeyemi, A. K. Kamar, and S. O. Emeje, 2021. Credit risk and bank performance in Nigeria: A panel analysis approach. *International Journal of Multidisciplinary Sciences and Advanced Technology* 2(1), 44–53.
- Ahmed, A. M., 2022. The relationship between firm size and profitability. Evidence from the commercial banks in Iraq. *The Scientific Journal of Cihan University Sulaimaniya* 6(1), 145-156.
- Al-Husainy, N. H. M., and H. M. Jadah, 2021. The effect of liquidity risk and credit risk on the bank performance: Empirical evidence from Iraq. *IRASD Journal of Economics* 3(1), 58-67.

- Alshatti, A. S., 2016. Determinants of banks' profitability: The case of Jordan. *Investment Management and Financial Innovations* 13(1), 84-91.
- Anggraeni A., B. Basuki, and R. Setiawan, 2022. Factors influencing on bank capital and profitability: Evidence of government banks in Indonesia. *The Journal of Asian Finance Economics and Business* 9(2), 185-191.
- Balango, T. K., and M. K. Rao 2017. Effect of NPL on profitability of banks with reference to commercial bank of Ethiopia. *Business and Management Research Journal* 7(1), 45-50.
- Begum, H., M. M. Rashid M. S. Haque and M. M. Uddin, 2022. Effect of liquidity on profitability of banks using revisited panel data analysis: Does Ownership structure matter? *International Journal of Asian Social Science* 12(6), 205-216.
- Bhattarai, Y. R., 2014. Effect of credit risk on the performance of Nepalese commercial banks. *Journal of Management and Finance* 1(1), 41-64.
- Brastama, R. F., and I. P. Yadnya, 2020. The effect of capital adequacy ratio and non-performing loan on banking stock prices with profitability as intervening variable. *American Journal of Humanities and Social Sciences Research (AJHSSR)* 4(12), 43-49.
- Bruni, M. E., P. Beraldi, and G. Iazzolino, 2014. Lending decisions under uncertainty: A DEA approach. *International Journal of Production Research* 52(3), 766-775.
- Buchory, H. A., 2021. Banking profitability: How does the credit risk and operational efficiency effect? Big data and artificial intelligence in the banking industry. In *Handbook of Financial Econometrics, Mathematics, Statistics, and Machine Learning* 1(1), 4025-4041.
- Chhetri, G. R., 2021. Effect of credit risk management on financial performance of Nepalese commercial banks. *Journal of Balkumari College* 10(1), 19-30.
- Das, S. K., and K. Uppal, 2021. NPAs and profitability in Indian banks: an empirical analysis. *Future Business Journal* 7(1), 1-9.
- Ekinci, R., and G. Poyraz, 2019. The effect of credit risk on financial performance of deposit banks in Turkey. *Procedia Computer Science* 158(1), 979-987.
- El-Nader, H. M., and A. D. Alraimony, 2012. The impact of macroeconomic factors on Amman stock market returns. *International Journal of Economics and Finance* 4(12), 202-213.
- Elshaday, T., D. Kenenisa, and S. Mohammed, 2018. Determinant of financial performance of commercial banks in Ethiopia: Special emphasis on private commercial banks. *African Journal of Business Management* 12(1), 1-10.
- Hallunovi, A., and M. Berdo, 2018. The relationship between credit risk management and profitability in commercial banks in Albania. *Asian Themes in Social Science Research* 1(2), 44-49.
- Irawati, N., and A. Maksum, 2018. The impact of risk management and bank size on profitability of commercial banking in Indonesia. *Economics and Business Journal* 46(1), 38-41.
- Kaaya, A., and D. Patory, 2013. Credit risk and commercial banks performance in Tanzania: A panel data analysis. *Research Journal of Finance and Accounting* 9(4), 16-23.
- Maccarthy, J., 2016. The effect of cash reserve ratio (CRR) on the financial performance of commercial bank and their engagement in CSR in Ghana. *Journal of Finance* 4(3), 1-12.
- Manandhar, A., 2015. Credit Risk Management in Indian Commercial Banks. *International Journal of Marketing, Financial Services and Management Research* 2(7), 47-51.

- Margolis, P., and R. Walsh, 2003. Foreign banks profit and commercial credit extension in the United States. *Journal of Financial Economics* 8(5), 533-539.
- Narula, S., and M. Singla, 2014. Empirical study on non-performing assets of bank. *International Journal of Advance Research in Computer Science and Management Studies* 2(1), 194-199.
- Nguyen, T. H., 2020. Impact of bank capital adequacy on bank profitability under Basel II Accord: Evidence from Vietnam. *Journal of Economic Development* 45(1), 31-46.
- Nuhiu, A., A. Hoti, and M. Bektashi, 2017. Determinants of commercial banks profitability through analysis of financial performance indicators: Evidence from Kosovo. *Business: Theory and Practice* 18(1), 160-170.
- Obim, E. N., S. M. Takon, and M. U. Mgbado, 2020. The impact of liquidity on banks profitability in Nigeria. *International Journal of Banking and Finance Research* 6(1), 1-8.
- Olagunju, A., A. O. David and O. O. Samuel, 2012. Liquidity management and commercial banks' profitability in Nigeria. *Research Journal of Finance and Accounting* 2(7-8), 24-38.
- Osakwe, C. I., and O. Nwakaego, 2022. The effect of central bank of Nigeria regulation on the performance of deposit money banks. *International Journal of Multidisciplinary and Current Educational Research* 4(1), 92-103.
- Parvin, S., A. M. Chowdhury, A. Siddiqua, and J. Ferdous, 2019. Effect of liquidity and bank size on the profitability of commercial banks in Bangladesh. *Asian Business Review* 9(1), 7-10.
- Qing, Y. K., and S. Kusairi, 2019. The Effect of money supply, exchange rate, and interest spread toward the performance of stock market in Malaysia. *Widyakala Journal* 6(2), 142-149.
- Rekik, M., and M. Kalai, 2018. Determinants of banks' profitability and efficiency: Empirical evidence from a sample of banking systems. *Journal of Banking and Financial Economics* 1(9), 5-23.
- Safitri, M., and V. Oktavia, 2022. The role of interest rates on the effect of non-performing loans and capital adequacy ratios on banking profitability (case study on conventional commercial banks listed on the Indonesia stock exchange 2016- 2020). *Jurnal Cakrawala Ilmiah* 1(7) 1785-1796.
- Shittu, I., and H. Abdulkadir, 2023. The Moderating effect of cost per loan asset ratio on the relationship between credit risk and financial performance of listed deposit money banks in Nigeria. *International Journal of Banking and Finance* 18(1), 95-115.
- Uddin, M. K., 2022. The effect of non-performing loan on state-owned commercial banks' profitability with operating efficiency as mediating variable. *European Journal of Business and Management Research* 7(3), 216-223.
- Wuave, T., H. Yua, and P. M. Yua, 2020. Effect of liquidity management on the financial performance of banks in Nigeria. *European Journal of Business and Innovation Research* 8(4), 30-44.
- Yusuf, M. O., C. I. Nwifo, and E. I. Chima, 2019. Optimum synergy between liquidity and profitability management of quoted banks: The Nigerian perspective. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 9(2), 138-148.

Chapter 17

Impact of interest rate changes on bank's stock return of Nepalese commercial banks

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Abstract

This study examines the impacts of interest rate changes on stock return of Nepalese commercial banks. Stock return and return on equity are the selected dependent variables. The selected independent variables are changes in interest rate, exchange rate, deposit interest rate, inflation rate, bank rate, and loan to deposit ratio. The study is based on secondary data of 12 commercial banks with 108 observations for the study period from 2014/15 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of interest rate changes on stock return of Nepalese commercial banks.

The study showed that interest rate has a negative impact on stock return and return on equity. It indicates that increase in interest rate leads to decrease in stock return and return on equity. Similarly, exchange rate has a negative impact on stock return and return on equity. It indicates that increase in exchange rate leads to decrease in stock return and return on equity. Likewise, deposit interest rate has a negative impact on stock return and return on equity. It indicates that increase in deposit interest rate leads to decrease in stock return and return on equity. Further, inflation rate has a negative impact on stock return and return on equity. It indicates that higher the inflation rate, lower would be the stock return and return on equity. In addition, bank rate has a negative impact on stock return and return on equity. It indicates that increase in bank rate leads to decrease in stock return and return on equity. However, loan to deposit ratio has a positive impact on stock return and return on equity. It indicates that higher the loan to deposit ratio, higher would be the stock return and return on equity.

Keywords: changes in interest rate, exchange rate, deposit interest rate, inflation rate, bank rate, loan to deposit ratio, stock return, return on equity

1. Introduction

Interest rate changes significantly impact a firm's worth by influencing its cost of capital, profitability, and valuation. When interest rates rise, borrowing becomes more expensive, increasing the cost of debt and reducing net income, which lowers profitability and the firm's valuation. Higher rates also increase the discount rate used in valuation models, reducing the present value of future cash flows. Conversely, falling interest rates lower borrowing costs, enhance profitability, and increase the present value of cash flows, boosting the firm's worth. Additionally, interest rate changes affect consumer and business spending, with higher rates discouraging spending and investment, potentially reducing revenues, while lower rates stimulate economic activity and growth (Francis et al., 2005). The stock market is a volatile environment with dramatic moves that give investors positive or negative signs about stock market returns. Both inflation rates and interest rates are two key macroeconomic variables that have great impacts on the economy in general and on the stock market in particular (Gebhardt et al., 2001). Alterations in interest rates substantially affect a company's value by impacting its capital costs, profitability, and overall valuation. Rising interest rates elevate borrowing costs, augmenting debt expenses and diminishing net income, hence decreasing profitability and the firm's valuation. Elevated rates can augment the discount rate included in valuation models, so diminishing the current value of future cash flows. Conversely, declining interest rates reduce borrowing expenses, augment profitability, and elevate the present value of cash flows, so enhancing the firm's value. Moreover, fluctuations in interest rates influence consumer and corporate expenditure, since elevated rates deter spending and investment, possibly diminishing revenues, whereas reduced rates foster economic

activity and expansion (Hribar and Jenkins, 2004).

Uwubanmwun and Omorokunwa (2015) investigated the impact of inflation on stock returns in Nigerian stock market. The study showed that inflation has a negative impact on stock return. Inflation can negatively impact stock returns because it erodes the purchasing power of money and increases costs for businesses, which can reduce profitability. Higher inflation often prompts central banks to raise interest rates, making borrowing more expensive and slowing economic growth, which can further hurt corporate earnings. Additionally, inflation reduces the real value of future cash flows, leading to lower valuations for stocks. These factors combined create an environment where investors may demand higher returns to compensate for increased risk and diminished purchasing power, often resulting in falling stock prices and reduced returns. Similarly, Alam and Uddin (2009) examined the relationship between stock prices and rate of interest in total 15 developing and developed countries. The study revealed that there is a negative and an insignificant relationship with stock prices. Likewise, Eita (2014) analyzed the informal relationship between stock return of market and interest rate in from the year 1996 to 2013 in Namibia, applying co-integrated vector auto-regression and granger causality test methods. The study found a negative relationship between stock returns of market and interest rates. The result indicates that there is bi-directional causality between stock market returns and interest rate. It suggested that there is reduction in monetary policy through interest rate increment lead to decrease in stock market returns in Namibia.

Flannery and Protopapadakis (2002) assessed an influences of macroeconomic factors on stock return. The study observed that money growth and inflation have significant impact on stock market returns. The study also stated that macroeconomic factors such as consumer price index, producers' price index, monetary aggregate, balance of trade and unemployment are the major determinants of stock returns. In addition, Kandir (2008) analyzed the role of macroeconomic variables in explaining stock return and performance using data of non-financial firms for the period 1997-2005. The study concluded that macroeconomic variables such as inflation, interest rate and exchange rates have explanatory power to explain stock return whereas money supply and oil prices have no significant impact on stock returns. Moreover, Etale and Eze (2019) examined the macroeconomic variables and stock market performance. The study indicated a significant positive impact of money supply and exchange rate on stock market performance whereas negative impact of interest rate and inflation ration on stock market performance. Similarly, John (2019) concluded that stock market performance is significantly influenced by macroeconomic variables such as money supply, interest rate, exchange rate and inflation. Stock market performance is significantly influenced by macroeconomic variables such as money supply, interest rates, exchange rates, and inflation, as they shape the overall economic environment in which businesses operate. An increase in money supply can boost liquidity, driving investment and stock prices upward, while tighter monetary policies may constrain market growth. Interest rates affect the cost of borrowing and the valuation of future cash flows, with higher rates typically leading to lower stock prices. Exchange rate fluctuations influence multinational corporations through their impact on trade balances and earnings from foreign operations. Inflation affects corporate profitability by increasing costs and reducing consumer purchasing power, often pressuring stock valuations. Together, these factors play a critical role in shaping investor sentiment and market dynamics.

Khalid and Khan (2017) examined the effects of macroeconomic variables on the stock market volatility in Pakistan. The study showed a positive impact real gross domestic product on inflation and stock market performance. Similarly, Mashayekh *et al.* (2011) analyzed the impact of macroeconomic variables on stock market in the case of Iran. The study stated that there exist a positive and significant relationship between stock trade and inflation volume quantity. The study also showed that there is a negative relationship between deposit interest rate and stock market index. Likewise, Sireesha (2013)

examined the effect of selected macro-economic variables on stock returns in India. The study stated that stock returns are positively influenced by inflation, GDP and exchange rate. Further, Wickremasinghe (2011) analyzed the causal relationships between stock prices and macroeconomic variables in Sri Lanka. The study indicated that there are both short and long-run causal relationships between stock prices and macroeconomic variable.

In the context of Nepal, interest rate movements or shifts happens due to the economic or financial market. The rise in interest rate generally tends to increase saving and decreases the discharge of loan from bank and vice versa. If the interest rate changes the investors begins to equate the stock market returns. Dangol (2008) examined the response of stock market of Nepal to declaration of unpredicted political events. The study concluded that good-news (bad news) political declaration derives positive (negative) unusual returns in the post event time. The study also indicated that there is a strong relation between political unpredictability and stock returns. Similarly, Devkota and Dhungana (2019) analyzed the impact of macroeconomic variables on the stock market in Nepal using an ARDL approach. The study showed that the sensitivity of Nepal's stock market to interest rate fluctuations, indicating the need for cautious consideration of monetary policy decisions when analyzing stock market trends. Likewise, Aryal (2020) analyzed the impact of macro-economic variables on stock market price in Nepal. The study revealed that there is an insignificant or negative relationship between exchange rate and interest rate and significant relationship between inflation and stock market performance measured by NEPSE index. Further, Karki (2018) investigated the stock market responses to macroeconomic dynamics: Testing for long-run equilibrium in Nepal. The study revealed that there exists a positive and significant relationship between stock market responses and macroeconomic dynamics. Furthermore, the results demonstrated that GDP, inflation and money supply have positive relationship with stock market prices and negative relationship with interest rate. Moreover, Gyawali (2022) examined the factors influencing the stock price of Nepalese commercial banks. The study demonstrated that integrating DPS, EPS and P/E ratios into investment strategies strengthens the predictive power of stock price analysis under varying economic conditions.

The above discussion shows that empirical evidences vary greatly across the studies on the impacts of interest rate changes on banks stock return of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impacts of interest rate changes on banks stock return of Nepalese commercial banks. Specifically, it examines the relationship of interest rate, exchange rate, deposit interest rate, inflation rate, bank rate, and loan to deposit ratio with stock return of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 12 Nepalese commercial banks from 2014/15 to 2022/23, leading to a total of 108 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with the study period and number of observations

S.N.	Name of the banks	Study period	Observations
Public bank			
1	Nepal Bank Limited	2014/15-2022/23	9
Joint venture banks			
3	Everest Bank Limited	2014/15-2022/23	9
4	NMB Bank Limited	2014/15-2022/23	9
5	Standard Chartered Bank Nepal Limited	2014/15-2022/23	9
6	Himalyan Bank Limited	2014/15-2022/23	9
7	Prabhu Bank Limited	2014/15-2022/23	9
Private banks			
7	Machhapuchchhre Bank Limited	2014/15-2022/23	9
8	Sanima Bank Limited	2014/15-2022/23	9
9	Siddhartha Bank Limited	2014/15-2022/23	9
10	Prime Commercial Bank Limited	2014/15-2022/23	9
11	Citizens Bank International Limited	2014/15-2022/23	9
12	Nepal SBI Bank Limited	2014/15-2022/23	9
Total number of observations			108

Thus, the study is based on the 108 observations.

The model

The model used in this study assumes that stock returns depends upon interest rate changes. The dependent variables selected for the study are stock return and return of equity. Similarly, the selected independent variables are interest rate, exchange rate, deposit interest rate, inflation rate, bank rate, and loan to deposit ratio. Therefore, the models take the following forms:

$$SR_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 EXR_{it} + \beta_3 DIR_{it} + \beta_4 INF_{it} + \beta_5 BR_{it} + \beta_6 LDR_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 EXR_{it} + \beta_3 DIR_{it} + \beta_4 INF_{it} + \beta_5 BR_{it} + \beta_6 LDR_{it} + e_{it}$$

Where,

SR = Stock return as measured by the capital gain yield, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

IR = General average interest rate for the fiscal year, in percentage.

EXR = Exchange rate, Rupees to US Dollar.

BR = Bank rate as measured by the cost of return as a percentage of the amount by bank, in percentage.

DIR = Deposit interest rate as measured by the rate paid by banks to the customers, in percentage.

INF = Inflation measured as measured by the change in consumer price index, in percentage.

LTDR = Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

The following section describes the independent variables used in this study along with the

hypothesis formulation:

Interest rate

Khan and Yousuf (2013) examined the interest rate and commercial banks' profitability. The study showed that there is negative relationship between deposit interest rate and banks' profitability. In a competitive banking market, banks may be unable to fully transfer the increased cost of deposits to borrowers through higher loan rates. This leads to lower profitability. Similarly, Martinez-Moya *et al.* (2013) investigated the relationship between interest rate changes and stock returns in Spain using a wavelet-based approach. The study found that increase in interest rate leads to lower the stock prices. Likewise, Huang *et al.* (2016) discovered an insignificant negative correlation between price of stock market and the actual rate of interest. Based on it, this study develops the following hypothesis:

H₁: There is a negative relationship between changes in interest rate and stock returns.

Exchange rate

A stronger domestic currency makes imports cheaper, benefiting industries reliant on imported raw materials, potentially boosting their profitability and stock returns. Chkili and Nguyen (2014) showed that exchange rates fluctuations do not influence stock market returns of BRCIS countries. A weaker domestic currency raises import costs, increasing input costs and reducing margins for these firms, leading to lower stock returns. Likewise, Khan (2019) showed that exchange rate has a significant but negative influences on stock returns. Further, Javangwe and Takawira (2022) discovered that exchange rate has a negative impact on stock return in long run. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between exchange rate and stock returns.

Deposit interest rate

Increase the cost of borrowing for businesses, reducing capital investment, slowing growth, and ultimately lowering expected future cash flows. This leads to a decline in stock valuations. Korkeamaki (2011) disclosed that stock prices are fundamentally the present value of expected future cash flows. When interest rates rise, the discount rate (often derived from interest rates) increases, reducing the present value of these cash flows and causing stock prices to fall. Similarly, Hutasoit *et al.* (2022) revealed that interest rates have not been able to regulate the impact of return on equity on stock prices of banks on ISE (Indonesia stock exchange). Likewise, Pervaiz *et al.* (2018) concluded that if there is an increment in interest rate convinces the equity holders to shift towards stocks or reserves policy which leads stock prices to decline. In contrast, Asravor and Fonu (2020) identified that interest rates have positive impact on stock exchange expansion. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between deposit interest rate and stock returns.

Inflation rate

Khan and Yousuf (2013) investigated the relationship of several macro-economic influences and stock prices of Dhaka Stock Exchange (DSE). The study stated that inflation does not revealed any positive impact on stock prices. Similarly, Dasgupta (2012) showed that inflation rate has a negative impact on stock returns. Likewise, Saleem *et al.* (2013) investigated the run relationship between inflation and stock return evidenced from Pakistan. The study stated that there is a negative relationship between KSE 100 index return and inflation rate. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between inflation rate and stock returns.

Bank rate

Bank rate is the capacity of a bank to execute business activities smoothly and skilled to meet responsibilities accordingly with relevant banking guidelines. Fatmasari *et al.* (2023) showed that bank rate has a positive influence on stock returns. Similarly, Ginting and Matondang (2022) discovered that bank rate has a negative but significant impacts on stock returns in mining industry of Indonesia Stock Exchange. Likewise, Utama and Puryandani (2020) indicated that bank rate has a negative influences on stock price index return. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between bank rate and stock returns.

Loan to deposit ratio

When there is an increase in loan to deposit ratio, more progressive the bank liquid assets leads to favorable the banking productivity which leads to instantly positively influence on stock return. Similarly, Elbadry (2018) showed that loan to deposit ratio has a positive outcomes on stock returns. Likewise, Niu (2016) found that loan to deposit ratio has an insignificant impact on stock return. Further, Iskandar (2020) demonstrated that there is a positive correlation between loan to deposit ratio and stock returns. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between loan to deposit ratio and stock returns.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2014/15 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are SR (Stock return as measured by the capital gain yield, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are IR (General average interest rate for the fiscal year, in percentage), EXR (Exchange rate, Rupees to US Dollar), BR (Bank rate as measured by the cost of return as a percentage of the amount by bank, in percentage), DIR (Deposit interest rate as measured by the rate paid by banks to the customers, in percentage), INF (Inflation measured as measured by the change in consumer price index, in percentage), and LTDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
SR	-66.33	146.80	0.012	42.83
ROE	3.78	42.94	19.76	5.46
IR	4.56	8.37	6.62	1.06
EXR	99.5	130.6	112.81	9.70
INF	3.6	9.7	6.02	2.00
DIR	1.02	23.21	4.99	2.45
BR	5	8.5	6.8	1.17
LDR	48.32	96.70	110.12	9.26

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are SR (Stock return as measured by the capital gain yield, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are IR (General average interest rate for the fiscal year, in percentage), EXR (Exchange rate, Rupees to US Dollar), BR (Bank rate as measured by the cost of return as a percentage of the amount by bank, in percentage), DIR (Deposit interest rate as measured by the rate paid by banks to the customers, in percentage), INF (Inflation measured as measured by the change in consumer price index, in percentage), and LTDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage).

Variables	SR	ROE	CIR	EXR	DIR	INF	BR	LDR
SR	1							
ROE	0.250**	1						
IR	-0.615*	-0.038	1					
EXR	-0.100	-0.360	0.227	1				
DIR	-0.197*	-0.239**	0.365	-0.327	1			
INF	-0.048	-0.660*	0.610*	0.059	0.253	1		
BR	-0.497	-0.146	0.868**	-0.048	0.440	0.488	1	
LDR	0.091	0.295**	-0.269	0.249	0.132	0.011	-0.318	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that interest rate has a negative relationship with stock returns. It indicates that increase in interest rate leads to decrease in stock returns. Similarly, there is a negative relationship between exchange rate and stock returns. It indicates that increase in exchange rate leads to decrease in stock returns. Likewise, there is a negative relationship between deposit interest rate and stock returns. It indicates that increase in deposit interest rate leads to decrease in stock returns. Further, inflation rate has a negative relationship with stock returns. It indicates that higher the inflation rate, lower would be the stock returns. In addition, bank rate has a negative relationship with stock returns. It indicates that increase in bank rate leads to decrease in stock returns. In contrast, loan to deposit ratio has a positive relationship with stock returns. It indicates that higher the loan to deposit ratio, higher would be the stock returns.

Similarly, the result also shows that interest rate has a negative relationship with return on equity. It indicates that increase in interest rate leads to decrease in return on equity. Similarly, there is a negative relationship between exchange rate and return on equity. It indicates that increase in exchange rate leads to decrease in return on equity. Likewise, there is a negative relationship between deposit interest rate and return on equity. It indicates that increase in deposit interest rate leads to decrease in return on equity. Further, inflation rate has a negative relationship with return on equity. It indicates that higher the inflation rate, lower would be the return on equity. In addition, bank rate has a negative relationship with return on equity. It indicates that increase in bank rate leads to decrease in return on equity. In contrast, loan to deposit ratio has a positive relationship with return on equity. It indicates that higher the loan to deposit ratio, higher would be the return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of change in interest rate, exchange rate, deposit interest rate, inflation rate, bank rate and loan to deposit ratio on stock return in the context of Nepalese commercial banks.

Table 4

Estimated regression results of change in interest rate, exchange rate, deposit interest rate, inflation rate, bank rate and loan to deposit ratio on stock return

The results are based on panel data of 12 commercial banks with 108 observations for the period from 2014/15 to 2022/23 by using the linear regression model and the model is $SR_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 EXR_{it} + \beta_3 DIR_{it} + \beta_4 INF_{it} + \beta_5 BR_{it} + \beta_6 LDR_{it} + e_{it}$ where the dependent variable is SR (Stock return as measured by the capital gain yield, in percentage). The independent variables are IR (General average interest rate for the fiscal year, in percentage), EXR (Exchange rate, Rupees to US Dollar), BR (Bank rate as measured by the cost of return as a percentage of the amount by bank, in percentage), DIR (Deposit interest rate as measured by the rate paid by banks to the customers, in percentage), INF (Inflation measured as measured by the change in consumer price index, in percentage), and LTDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		IR	EXR	DIR	INF	BR	LDR			
1	162.181 (2.061)*	-24.307 (2.068)*						0.291	35.320	4.277
2	-47.677 (0.259)		-0.434 (0.267)					0.131	44.600	0.071
3	17.471 (1.867)			-3.443 (2.070)*				0.030	42.190	4.286
4	7.428 (0.149)				-1.023 (0.129)			0.140	44.780	0.017
5	121.597 (1.514)					-17.753 (1.518)		0.140	38.890	2.304
6	35.006 (0.941)						0.424 (0.947)	0.001	42.850	0.896
7	53.664 (0.343)	-26.584 (2.147)*	-1.096 (0.809)					0.254	36.231	2.360
8	61.375 (0.344)	-25.461 (1.650)	-0.981 (0.590)	-0.384 (0.150)				0.109	39.597	1.325
9	59.497 (0.369)	-39.342 (2.332)**	-1.188 (0.788)	-0.366 (0.161)	-11.674 (1.457)			0.272	35.784	1.747
10	-34.68 (0.193)	-68.480 (2.168)*	-2.037 (1.221)	-0.480 (0.216)	-13.256 (1.663)	-27.266 (1.087)		0.304	34.996	1.698
11	-180.745 (0.618)	-63.793 (1.781)	-1.879 (1.013)	-0.847 (0.270)	-13.256 (1.663)	-25.494 (0.917)	1.911 (0.681)	0.152	38.620	1.239

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Stock return is the dependent variable.

Table 4 shows that the beta coefficients for change in interest rate are negative with stock return. It indicates that change in interest rate has a negative impact on stock return. This finding is similar to the findings of Martinez-Moya *et al.* (2013). Similarly, the beta coefficients for exchange rate are negative with stock return. It indicates that exchange rate has a negative impact on stock return. This finding is consistent with the findings of Chkili *et al.* (2014). Likewise, the beta coefficients for deposit interest rate are negative with stock return. It indicates that deposit interest rate has a negative impact on stock return. This finding is similar to the findings of Hutasoit *et al.* (2022). In addition, the beta coefficients for inflation rate are negative with stock return. It indicates that inflation rate has a negative impact on stock return. This finding is consistent with the findings of Khan and Yousuf (2013). Further, the beta coefficients for bank rate are negative with stock return. It indicates that bank rate has a negative impact on stock return. This finding is similar to the findings of Utama and

Puryandani (2020). However, the beta coefficients for loan to deposit ratio are positive with stock return. It indicates that loan to deposit ratio has a positive impact on stock return. This finding is similar to the findings of Elbadry (2018).

Table 5 shows the regression results of change in interest rate, exchange rate, deposit interest rate, inflation rate, bank rate and loan to deposit ratio on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of change in interest rate, exchange rate, deposit interest rate, inflation rate, bank rate and loan to deposit ratio on return on equity

The results are based on panel data of 12 commercial banks with 108 observations for the period from 2014/15 to 2022/23 by using the linear regression model and the model is $ROE_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 EXR_{it} + \beta_3 DIR_{it} + \beta_4 INF_{it} + \beta_5 BR_{it} + \beta_6 LDR_{it} + e_{it}$ where the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are IR (General average interest rate for the fiscal year, in percentage), EXR (Exchange rate, Rupees to US Dollar), BR (Bank rate as measured by the cost of return as a percentage of the amount by bank, in percentage), DIR (Deposit interest rate as measured by the rate paid by banks to the customers, in percentage), INF (Inflation measured as measured by the change in consumer price index, in percentage), and LTDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		IR	EXR	DIR	INF	BR	LDR			
1	11.199 (0.425)	-0.402 (0.102)						0.141	11.827	0.010
2	60.23 (1.324)		-0.411 (1.023)					0.006	11.040	1.046
3	17.88 (15.141)**			-0.534 (2.543)**				0.006	11.040	1.046
4	-8.119 (0.819)				-3.650 (2.325)*			0.355	8.891	5.400
5	4.517 (0.187)					-1.378 (0.391)		0.118	11.700	0.153
6	29.58 (6.505)**						0.174 (3.186)**	0.079	5.240	10.150
7	55.183 (1.080)	-1.325 (0.328)	-0.444 (1.005)					0.140	11.819	0.510
8	70.862 (1.341)	-3.600 (0.790)	-0.677 (1.377)	-0.780 (1.047)				0.122	11.720	0.711
9	69.99 (2.932)**	-2.779 (1.113)	-0.582 (2.607)**	-0.772 (2.293)*	-5.371 (4.258)**			0.771	5.300	7.737
10	54.35 (2.150)*	-7.679 (1.720)	-0.441 (1.880)	-0.791 (2.530)**	5.634 (5.030)**	4.520 (1.280)		0.803	4.900	7.537
11	28.710 (0.750)	-6.790 (1.450)	-0.469 (1.930)	-0.558 (1.360)	5.232 (4.240)**	4.210 (1.160)	0.335 (0.914)	0.792	5.050	6.074

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Return on equity is the dependent variable.

Table 5 shows that the beta coefficients for change in interest rate are negative with return on equity. It indicates that change in interest rate has a negative impact on return on equity. This finding is similar to the findings of Khan *et al.* (2013). Similarly, the beta coefficients for exchange rate are negative with return on equity. It indicates that exchange rate has a negative impact on return on equity. This finding is consistent with the findings of Javangwe and Takawira (2022). Likewise, the beta coefficients for deposit interest rate are negative with return on equity. It indicates that deposit interest rate has a negative impact on return on equity. This finding is consistent with the findings of Pervaiz *et al.* (2018). In addition, the beta coefficients for inflation rate are negative with return on equity. It indicates that inflation rate has a negative impact on stock return. This finding is similar to the findings

of Dasgupta (2012). Further, the beta coefficients for bank rate are negative with return on equity. It indicates that bank rate has a negative impact on return on equity. This finding is similar to the findings of Ginting and Matondang (2022). However, the beta coefficients for loan to deposit ratio are positive with return on equity. It indicates that loan to deposit ratio has a positive impact on return on equity. This finding is consistent with the findings of Iskandar (2020).

4. Summary and conclusion

Fluctuations in interest rates substantially influence a company's value by modifying its cost of capital, profitability, and valuation. Elevated interest rates augment the expense of debt, rendering borrowing costlier, and elevate the discount rate, therefore diminishing the current value of future cash flows and total valuation. Moreover, heightened interest expenditures diminish profitability, especially for companies with significant debt, while demand for products and services may wane in rate-sensitive industries, further impacting sales and earnings. Conversely, companies possessing excess cash may gain from increased interest revenue. These dynamics demonstrate the impact of interest rates on operational success and investor perceptions of a company's worth.

This study attempts to analyze the impacts of interest rate changes on stock return of Nepalese commercial banks. The study is based on secondary data of 12 commercial banks with 108 observations for the period from 2014/15 to 2022/23.

The major conclusion of this study is that interest rate, exchange rate, deposit interest rate, inflation rate, and bank rate have negative impact on stock return and return on equity. It indicates that increase in interest rate, exchange rate, deposit interest rate, inflation rate, and bank rate leads to decrease in stock return and return on equity. However, loan to deposit ratio has a positive impact on stock return and return on equity. It indicates that increase in loan to deposit ratio leads to increase in stock return and return on equity. Likewise, the study also concluded that deposit interest rate followed by interest rate is the most influencing factor that explains the changes in the stock return in the context of Nepalese commercial banks. Similarly, the study also concluded that loan to deposit ratio followed by deposit interest rate is the most influencing factor that explains the changes in return on equity in the context of Nepalese commercial banks.

References

- Alam, M. M., and G. Uddin, 2009. Relationship between interest rate and stock price: empirical evidence from developed and developing countries. *International Journal of Business and Management* 4(3), 43-51.
- Aryal, P., 2020. Impact of macroeconomic variables on stock market price in Nepal. *Journal of Economics and Finance* 11(5), 56-61.
- Asravor, R. K., and P. D. D. Fonu, 2021. Dynamic relation between macroeconomic variable, stock market returns and stock market development in Ghana. *International Journal of Finance and Economics* 26(2), 2637-2646.
- Chkili, W., and D. K. Nguyen, 2014. Exchange rate movements and stock market returns in a regime-switching environment: Evidence for BRICS countries. *Research in International Business and Finance* 31(18), 46-56.
- Dangol, J., 2008. Unanticipated political events and stock returns: An event study. *NRB Economic Review* 20(2), 86-110.
- Dasgupta, R., 2012. Long-run and short-run relationships between BSE Sensex and macroeconomic variables. *International Research Journal of Finance and Economics* 95(5), 135-150.
- Devkota, T., and A. Dhungana, 2019. Impact of macroeconomic variables on the stock market in Nepal: An ARDL approach. *The Journal of Economic Concern* 10(1), 47-64.

- Eita, J. H., 2014. Interest rate and stock market returns in Namibia. *The International Business and Economics Research Journal* 13(4), 689-694.
- Elbadry, A., 2018. Bank's financial stability and risk management. *Journal of Islamic Accounting and Business Research* 9(2), 1799-1817.
- Etale, L. M., and G. P. Eze, 2019. Analyzing stock market reaction to macroeconomic variables: Evidence from Nigerian Stock Exchange (NSE). *Global Journal of Arts, Humanities and Social Sciences* 7(3), 14-28.
- Fatmasari, D., N. Wahyuningsih, L. Tamara, N. Kurnia, and S. A. Habibah, 2023. Analysis of exchange rate, inflation and bi rate on return of Syari'ah share. *Journal of Economics* 16(1), 517-530.
- Flannery, M. J., and A. A. Protopapadakis, 2002. Macroeconomic factors do influence aggregate stock return. *The Review of Financial Studies* 15(3), 751-782.
- Francis, J. R., I. K. Khurana, and R. Pereira, 2005. Disclosure incentives and effects on cost of capital around the world. *The Accounting Review* 80(4), 1125-1162.
- Gebhardt, W. R., C. M. Lee, and B. Swaminathan, 2001. Toward an implied cost of capital. *Journal of Accounting Research* 39(1), 135-176.
- Ginting, E. D. B., and S. Matondang, 2022. Effect of macroeconomic factors (exchange, inflation, SBI interest rate, world oil price) on stock returns with profitability as intervening variables in mining sector companies in the Indonesia stock exchange 2015-2019. *International Journal of Educational Research and Social Sciences* 3(4), 1577-1586.
- Gyawali, B., 2022. Factors influencing the stock price of Nepalese commercial banks. *Patan Prospective Journal* 2(1), 18-26.
- Hribar, P., and N. T. Jenkins, 2004. The effect of accounting restatements on earnings revisions and the estimated cost of capital. *Review of Accounting Studies*, 9(1), 337-356.
- Huang, W., A. V. Mollick, and K. H. Nguyen, 2016. US stock markets and the role of real interest rates. *The Quarterly Review of Economics and Finance* 59(2), 231-242.
- Hutasoit, D. T. M., N. Toni, and Y. Ariesa, 2022. Effect of loan to deposit ratio, capital adequacy ratio, return on equity, and dividend payout ratio on stock prices with Bank Indonesia interest rates as moderating variables in banking companies on the Indonesia Stock Exchange. *International Journal of Social and Management Studies* 3(3), 137-149.
- Iskandar, Y., 2020. The influence of capital adequacy ratio, loan-to-deposit ratio, and net interest margin on stock return at commercial banks in Indonesia. *Jurnal Aplikasi Manajemen* 18(3), 533-538.
- Javangwe, K. Z., and O. Takawira, 2022. Exchange rate movement and stock market performance: An application of the ARDL model. *Cogent Economics and Finance* 10(1), 207-215.
- John, E. I., 2019. Effect of macroeconomic variables on stock market performance in Nigeria. *Journal of Economics, Management and Trade* 22(6), 1-14.
- Kandir, S., 2008. Macroeconomic variables, firm characteristics and stock returns: Evidence from Turkey. *International Research Journal of Finance and Economics* 16(3), 35-44.
- Karki, D. E., 2018. Stock market responses to macroeconomic dynamics: Testing for long-run equilibrium in Nepal. *Pravaha* 24(1), 64-82.
- Khalid, W., and S. Khan, 2017. Effects of macroeconomic variables on the stock market volatility: the Pakistan experience. *International Journal of Econometrics and Financial Management* 5(2), 42-59.
- Khan, M. K., 2019. Impact of exchange rate on stock returns in Shenzhen stock exchange: Analysis through ARDL approach. *International Journal of Economics and Management* 1(2), 15-26.
- Khan, M. M., and A. S. Yousuf, 2013. Macroeconomic forces and stock prices: Evidence from the Bangladesh

- stock market. *ZBW-Leibniz Information Centre for Economics* 12(2), 1-54.
- Korkeamaki, T., 2011. Interest rate sensitivity of the European stock markets before and after the euro introduction. *Journal of International Financial Markets, Institutions and Money* 21(5), 811-831.
- Martinez-Moya, P., R. Ferrer-Lapena, and F. Escribano-Sotos, 2013. Relationship between interest rate changes and stock returns in Spain: a wavelet-based approach. *Journal of Economics and Finance* 4(6), 1-24.
- Mashayekh, S., H. H. Moradkhani, and M. Jafari, 2011. Impact of macroeconomic variables on stock market: The case of Iran. *Journal of Business and Economic Research Proceeding* 14(5), 350-360
- Niu, J., 2016. Loan growth and bank valuations. *Journal the Quarterly Review of Economics and Finance* 61(2), 185-191.
- Pervaiz, J., J. Masih, and T. J. Zhou, 2018. Impact of macroeconomic variables on Karachi Stock Market Returns. *International Journal of Economics and Finance* 10(2), 27-34.
- Saleem, F., L. Zafar, and B. Rafique, 2013. Long run relationship between inflation and stock return: evidence from Pakistan. *Academic Research International* 4(2), 407-418.
- Sireesha, P., 2013. Effect of select macro-economic variables on stock returns in India. *International Journal of Marketing, Financial Services and Management Research* 6(2), 197-209.
- Utama, O. Y., and S. Puryandani, (2020). The effect of bi rate, USD to IDR exchange rates, and gold price on stock returns listed in the SRI KEHATI index. *JDM (Jurnal Dinamika Manajemen)* 11(1), 39-47.
- Uwubanmwun, A. E., and O. G. Omorokunwa, 2015. Oil price volatility and stock price volatility: Evidence from Nigeria. *Academic Journal of Interdisciplinary Studies* 4(1), 253-268.
- Wickremasinghe, G., 2011. The Sri Lankan stock market and the macro economy: An empirical investigation. *Studies in Economics and Finance* 28(3), 179-195.

Chapter 18

Bank efficiency and stock return: A case of Nepalese commercial banks

- Rasish Kilambu*

Abstract

This study examines the impact of bank efficiency on stock return of Nepalese commercial banks. Stock return and earnings per share are the selected dependent variables. The selected independent variables are operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, and return on equity. The study is based on secondary data of 10 commercial banks with 100 observations for the study period from 2013/14 to 2022/23. The secondary data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, and return on equity on the stock return of Nepalese commercial banks.

The study showed operational efficiency has positive impact on stock return. It indicates that higher the operational efficiency, higher would be the stock return. However operational efficiency has negative impact on earnings per share. It indicates that higher the operational efficiency, lower would be the earnings per share. Similarly, net interest margin has negative impact on stock return. It means that higher the net interest margin, lower would be the stock return. However, net interest margin has positive impact on earnings per share. It means higher the net interest margin, higher would be the earning per share. Moreover, price earnings ratio has a positive impact on stock return and earnings per share. It indicates that higher the price earnings ratio, higher would be the stock return and earnings per share. Likewise, loan to deposit ratio has a negative impact on stock return and earnings per share. It indicates that decrease in loan to deposit ratio leads to increase in stock return and earnings per share. Furthermore, return on assets has a negative impact on stock return implying that higher the return on assets, lower would be the stock return. Similarly, return on equity has positive impact on stock return and earnings per share. It means higher the return on equity, higher would be the stock return and earnings per share.

Keywords: stock return, earnings per share, operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, return on equity

1. Introduction

The bank is a business entity that collects funds from the public in the form of deposits and distributes funds to the public in the form of credit and or other forms. Profit is one of the main goals of the banking industry. The financial performance is the company's ability to earn profits or a measure of the effectiveness of company management. A high level of the financial performance can indicate that the bank is working efficiently. Commercial banks play a significant and energetic role for developing an economy of a country. When the banking sector in a country is functioning in an efficient, effective, and disciplined way, it leads to bring a rapid growth in the various sectors in the country. Many factors may impact on the financial performance of commercial banks. Basically, it can be categorized as bank internal factors and bank external factors. Bank internal or specific factors are capital adequacy, liquidity, operating expenses, assets quality, managerial efficiency, bank size and etc. Bank performance greatly affects the level of public trust, so it is important for banks to maintain good performance. Poor bank performance will lead to failure and lead to financial crises that will have negative consequences for economic development (Nuhui et al., 2017). A high level of the financial performance can also illustrate that the productivity of the bank is getting better, and can show the development of the bank itself. Therefore, the financial performance is very important both for the bank itself and for the customers and prospective customers of the bank. This increasing phenomenon of globalization has made the concept of efficiency more important both for the non-financial and financial institutions and banks

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are the part of them. Banks largely depends on competitive marketing strategy that determines their success and growth. The modalities of the banking business have changed a lot in the new millennium compared to the way they used to be in the years bygone (Bhatti and Hussain, 2010).

According to Adam et al. (2016), stock market is a major component of the securities market which directly mobilizes funds to finance productive projects by issuing shares in the market. Stock market is a very important economic institution that plays a crucial role in the economy by channeling investment where it is needed and can be put to the best use. The major internal factors that affect share prices are company performance, governance, liquidity position, dividends and earnings. The external factors include governmental regulations, business cycle, investor's attitude, market conditions, natural calamities and political uncertainties like strikes, blockades etc. (Alam et al., 2016). Specially, investors should consider the internal factors and external factors of a firm, when they invest in shares of a firm in order to maximize their earnings through stock market investment (Kengatharan, 2018). Al-Lozi and Obeidat (2016) examined the relationship between the stock return and financial indicators. The study revealed that financial ratios have significant relationship with stock return for more profits and less debts. Holthausen and Larcker (1992) employed a large number of financial ratios in testing predictability of stock returns. The study found that financial ratio analysis is useful in predicting stock returns. Martinez (1999) analyzed the association between financial ratios and stock returns for fifty industrial firms traded in the French stock market. The study confirmed that financial statement information helps in predicting stock returns. Furthermore, Lewellen (2004) also reported evidence that financial ratios have strong forecasting power on stock returns.

The stock market is all about dynamics and that is why investors and fund managers have been time and again confronted with the problem of accurately predicting the stock prices so as to earn decent returns (Tandon and Malhotra, 2013). Stocks in the banking industry are one of the stocks that are highly sought after by investors. Banks that have good health will attract many investors (Perdana and Adriana, 2018). For potential investors who are going to invest in stocks, they should first conduct an assessment of the health of the bank concerned so that investment risk can be minimized (Widagdo et al., 2020). There are two broad types of investors, relatively sophisticated or ordinary investors (e.g., individual investors or noise traders), whose time-varying demands for risky assets are not based on optimal forecasts of expected returns and relatively more sophisticated or smart investors (e.g., institutional investors or arbitrageurs), who respond to optimal forecasts of expected returns. Schmidt and Spreng (1996) revealed that better educated investors have a more extensive knowledge structure and are more capable of identifying, locating, and assimilating relevant information.

Yuhasril and Wahyono (2019) determined how much influence the loan to deposit ratio, capital adequacy ratio, and return on equity have on stock returns of conventional government-owned banks (SOEs) listed on the Indonesia Stock Exchange (BEI) for the period 2010-2017. The simultaneous test results (f test) of this study indicate that the ratio of loan to deposit ratio, capital adequacy ratio, and return on equity have a significant effect on stock returns in conventional domestic banking companies. Similarly, the results of the partial test (t test) showed that the loan to deposit ratio has a significant negative effect on stock returns, CAR has a significant positive effect on stock returns, whereas ROE does not have a significant effect on stock returns. Iskandar (2020) explained the influence of capital adequacy ratio, loan to deposit ratio and net interest margin on stock return at commercial banks in Indonesia. The results showed that the capital adequacy ratio, loan-to-deposit ratio, and net interest margin significantly influence the stock return of banking companies. Har and Ghafar (2015) explored the impact of accounting earnings on stock returns of Malaysia's plantation industry. The study revealed that ROE had the highest explanatory power in explaining the variation in stock returns. ROA and ROCE were discovered to have a negative and insignificant relationship to stock returns only during the economic period prior to a recession.

In the context of Nepal, Subedi and Pradhan (2022) showed that earnings per share, price earnings ratio, dividend per share, inflation and return on assets have positive impact on market stock price movement. However, lending rate has negative impact on market stock price movement. The study concluded that dividend per share followed by earnings per share and price earnings ratio is the most influencing factor that explain the changes in the market price per share of Nepalese commercial banks. The study also concluded that inflation followed by price earnings ratio and earnings per share is the most influencing factor that explain the changes in fluctuation in the market price per share in Nepalese commercial banks. Amatya (2016) determined the impact of firm specific and macroeconomic variables on market price of share and firm performance of Nepalese commercial banks consisting both bank specific and macro-economic factors. The study found that there is positive relationship of market price per share with return on assets, dividend per share, earning per share, price earnings ratio and gross domestic product. According to Shrestha and Subedi (2014), the performance of the Nepalese stock market was significantly influenced by a combination of factors, most notably the availability of liquidity and low interest rates, which created a conducive environment for investment and trading activities. These economic conditions encouraged investors to pour more funds into the stock market, driving up stock prices and overall market performance. Furthermore, the political environment in Nepal, characterized by stability or volatility, along with the government's policies, also played crucial roles in shaping investor confidence and market trends. Political stability often led to positive investor sentiment and market growth, while political unrest or unfavorable policies could deter investment and lead to market downturns. Thus, the interplay between economic factors such as liquidity and interest rates, and political determinants and policy decisions, collectively shaped the trajectory of the Nepalese stock market. Wagle (2021) assessed the determinants of the stock market price in commercial banks. The study found that firm's market to book, price earnings and earnings yield proportion have significant positive association with the stock market price.

The above discussion shows that empirical evidences vary greatly across the studies on the relationship between bank efficiency and stock return of commercial banks are of greater significance. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the relationship between bank efficiency and stock return of Nepalese commercial banks. Specifically, it examines the relationship of operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, and return on equity with stock return and earnings per share of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 10 Nepalese commercial banks for the study period from 2013/14 to 2022/23, leading to a total of 100 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with the study period and number of observations

S.N.	Name of the commercial banks	Study period	Observations
1	Everest Bank Limited	2013/14 - 2022/23	10
2	Himalayan Bank Limited	2013/14 - 2022/23	10
3	Machhapuchchhre Bank Limited	2013/14 - 2022/23	10
4	Nepal Bank Limited	2013/14 - 2022/23	10
5	NMB Bank Limited	2013/14 - 2022/23	10
6	Nepal SBI Bank Limited	2013/14 - 2022/23	10
7	Prime Commercial Bank Limited	2013/14 - 2022/23	10
8	Sanima Bank Limited	2013/14 - 2022/23	10
9	Siddhartha Bank Limited	2013/14 - 2022/23	10
10	Standard Chartered Bank Nepal Limited	2013/14 - 2022/23	10
Total number of observations			100

Thus, the study is based on the 100 observations.

The model

The model used in this study assumes that stock return of banks depends upon bank efficiency. The dependent variables selected for the study are stock return and earnings per share. Similarly, the selected independent variables in this study are operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, and return on equity. Therefore, the models take the following forms:

$$SR_{it} = \beta_0 + \beta_1 OE + \beta_2 NIM + \beta_3 PER + \beta_4 LTD + \beta_5 ROA + \beta_6 ROE + e_{it}$$

$$EPS_{it} = \beta_0 + \beta_1 OE + \beta_2 NIM + \beta_3 PER + \beta_4 LTD + \beta_5 ROA + \beta_6 ROE + e_{it}$$

Where,

SR = Stock returns as measured by change in price plus dividend by previous year's price, in percentage.

EPS = Earnings per share as measured by the ratio of company's total earnings to the total number of shares outstanding, in Rs.

OE = Operational efficiency as measured by the ratio of operational expenses to operational income, in percentage.

NIM = Net interest margin as measured by the ratio of net interest income to total assets, in percentage.

PER = Price earnings ratio is measured by the ratio of market value per share to earnings per share, in times.

LTD = Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to shareholder's equity, in percentage.

The following section describes the independent variables used in this study along with hypothesis formulation.

Operational efficiency

Operational efficiency in the context of banking refers to the ability of a bank or financial institution to effectively manage its resources, processes, and systems to achieve optimal performance

and maximize productivity while minimizing costs and risks. Dhillon and Vachhrajani (2012) revealed the insignificant positive correlation between operational efficiency and overall profitability. Datta and Al Mahmud (2018) revealed that explanatory variables like capital adequacy, operating efficiency and loan structure are positively related to profitability of a bank along with stock return. Uddin (2022) examined that there is positive and significant impact of operational efficiency and stock return. Musah et al. (2019) explored the positive association of operational efficiency and stock return. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between operational efficiency and stock return.

Net interest margin

Hardiyanti *et al.* (2016) found that net interest margin has a positive and significant effect on stock return. Higher profitability often translates to better financial health and stability, which can boost investor confidence and drive up the stock price. Puspitasari *et al.* (2021) also showed a positive effect of net interest margin on return on assets and stock return. Increased profitability might also lead to higher dividends, which can attract investors and positively impact stock returns. Similarly, Lartey *et al.* (2013) revealed that high net interest margin ratios tend to indicate high profit growth as well. Likewise, Budhathoki *et al.* (2020) found there is a positive relationship between net interest margin and profitability measured by return on assets and return on equity. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between net interest margin and stock return.

Price earnings ratio

The P/E ratio measures a company's current share price relative to its per-share earnings, and a high P/E ratio can indicate that a stock is overvalued or that investors expect high growth rates in the future. Conversely, a low P/E ratio might suggest that a stock is undervalued or that the company is experiencing difficulties. Hatta and Dwiyanto (2012) found that earnings per share and price earnings ratio have positive and significant effects on stock prices. Motamedi (2013) found a significant positive relationship between return of banks and systematic risk (Beta), size, volume of trade and P/E ratio. Golubeva et al. (2019) concluded that price earnings ratio, demand for the share, changes in government policies, economic conditions are the most influential factors of stock price. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between price earnings ratio and stock return.

Loan to deposit ratio

Purbaningsih and Fatimah (2014) revealed that credit to deposit ratio is negatively related to return on assets. High LDR indicates that a bank is lending a large portion of its deposits, which can signal higher risk and lower liquidity. If a bank is overly aggressive in its lending practices, it may face increased risk of loan defaults, especially during economic downturns. This higher risk can lead to concerns about the bank's financial stability and profitability, reducing investor confidence. Consequently, the stock price may decline, resulting in lower stock returns. Therefore, banks with higher LDRs often experience lower stock returns due to the increased risk and potential liquidity issues associated with high lending relative to deposits. Chowdhury and Zaman (2018) found that credit to deposit ratio has a negative relationship with return on assets and return on equity. Likewise, Golubeva et al. (2019) showed that credit to deposit ratio has a negative relationship with return on equity. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between loan to deposit ratio and stock return.

Return on assets

ROA measures a company's efficiency in generating profit from its total assets. Kabajeh *et al.* (2012) found that there is a positive relationship with return on assets and share return. Higher ROA indicates that the company is effectively utilizing its assets to produce earnings, signaling strong operational performance and profitability. This efficiency and profitability tend to boost investor confidence, increasing the demand for the company's stock and driving up its price. As a result, companies with higher ROA typically see better stock returns, reflecting their ability to convert assets into profitable outcomes. Jabbari and Fathi (2014) found that return on assets has a positive and significant impact on returns for Tehran based companies. Murniati (2016) indicated that there is a positive relationship with return on assets and stock price. Har and Ghafar (2015) concluded that return on assets has a positive and significant relationship with stock returns. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between return on assets and stock return.

Return on equity

ROE measures a company's profitability by showing how effectively it generates profit from shareholders' equity. Higher ROE indicates more efficient use of equity capital, suggesting strong financial health and management effectiveness, which typically attracts investors. This increased investor confidence often leads to higher demand for the company's stock, driving up its price and resulting in better stock returns. Therefore, companies with higher ROE generally experience higher stock returns, reflecting their superior ability to generate profits for shareholders. Hertina and Saudi (2019) concluded that there is a significant relationship between return on assets and price to book value and there is negative and insignificant effect of return on equity on price to book value ratio. Fauzi and Nizwan (2021) concluded that profitability measured using return on assets and return on equity have positive but insignificant effect on stock returns of telecommunications companies. Moreover, Badruzaman (2020) revealed that return on equity has a positive effect on stock prices. Al-Qudah (2016) concluded that there is a positive impact of return on equity on stock return in the Abu Dhabi Securities Exchange (ADX). Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between return on equity and stock return.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 10 Nepalese commercial banks for the study period from 2013/14 to 2022/23. The dependent variables are SR (Stock returns as measured by change in price plus dividend by previous year's price, in percentage) and EPS (Earnings per share as measured by the ratio of company's total earnings to the total number of shares outstanding, in Rs). The independent variables are OE (Operational efficiency as measured by the ratio of operational expenses to operational income, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), PER (Price earnings ratio is measured by the ratio of market value per share to earnings per share, in times), LTD (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), and ROE (Return on equity as measured by the ratio of net income to shareholder's equity, in percentage).

Variables	Minimum	Maximum	Mean	S. D.
SR	-65.58	188.78	9.15	51.70
EPS	9.18	86.04	27.59	12.69
OE	20.35	78.25	39.90	9.71
NIM	.09	4.79	2.97	.844
PER	7.03	78.33	22.51	11.13
LTD	48.92	96.08	82.00	9.47
ROA	.04	2.61	1.50	.5
ROE	1.06	35.59	14.46	5.79

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the Pearson's correlation coefficients of dependent and independent variables of 10 Nepalese commercial banks for the study period from 2013/14 to 2012/23. The dependent variables are SR (Stock returns as measured by change in price plus dividend by previous year's price, in percentage) and EPS (Earnings per share as measured by the ratio of company's total earnings to the total number of shares outstanding, in Rs). The independent variables are OE (Operational efficiency as measured by the ratio of operational expenses to operational income, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), PER (Price earnings ratio is measured by the ratio of market value per share to earnings per share, in times), LTD (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), and ROE (Return on equity as measured by the ratio of net income to shareholder's equity, in percentage).

Variables	SR	EPS	OE	NIM	PER	LTD	ROA	ROE
SR	1							
EPS	0.148	1						
OE	0.024	-0.264**	1					
NIM	-0.007	0.265**	-0.035	1				
PER	0.297**	0.343**	-0.026	-0.171	1			
LTD	-0.231*	-0.520**	-0.040	-0.160	-0.507**	1		
ROA	-0.074	0.502**	-0.520**	0.404**	-0.048	-0.270**	1	
ROE	0.081	0.423**	-0.385**	0.009	0.171	-0.136	0.382**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that there is a positive relationship between operational efficiency and stock return. It indicates that higher the operational efficiency, higher would be the stock return. Similarly, there is a negative relationship between net interest margin and stock return. It means that decrease in net interest margin leads to increase in stock return. However, price earnings ratio has a positive relationship with stock return. It means that increase in price earnings ratio leads to increase in stock return. Furthermore, there is a negative relationship between loan to debt ratio and stock return. It indicates that increase in loan to debt ratio leads to decrease in stock return. Similarly, there is a negative relationship between return on assets and stock return. It indicates that increase in return on assets leads to decrease in stock return. In contrast, return on equity has a positive relationship with stock return. It means that increase in return on equity leads to increase in stock return.

Similarly, the result also shows that there is a negative relationship between operational

efficiency and earnings per share. It indicates that higher the operational efficiency, lower would be the earnings per share. Similarly, there is a positive relationship between net interest margin and earnings per share. It means that increase in net interest margin leads to increase in earnings per share. In addition, price earnings ratio has a positive relationship with earnings per share. It means that increase in price earnings ratio leads to increase in earnings per share. Furthermore, there is a negative relationship between loan to debt ratio and earnings per share. It indicates that increase in loan to debt ratio leads to decrease in earnings per share. Similarly, there is a positive relationship between return on assets and earnings per share. It indicates that increase in return on assets leads to increase in earnings per share. In addition, return on equity has a positive relationship with earnings per share. It means that increase in return on equity leads to increase in earnings per share.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and the results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, and return on equity on stock return of Nepalese commercial banks.

Table 4

Estimated regression results of operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, and return on equity on stock return of Nepalese commercial banks

The results are based on panel data of 10 commercial banks with 100 observations for the period of 2013/14-2022/23 by using the linear regression model and the model is $SR_i = \beta_0 + \beta_1 OE + \beta_2 NIM + \beta_3 PER + \beta_4 LTD + \beta_5 ROA + \beta_6 ROE + e_i$ where, the dependent variable is SR (Stock returns as measured by change in price plus dividend by previous year's price, in percentage). The independent variables are OE (Operational efficiency as measured by the ratio of operational expenses to operational income, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), PER (Price earnings ratio is measured by the ratio of market value per share to earnings per share, in times), LTD (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), and ROE (Return on equity as measured by the ratio of net income to shareholder's equity, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		OE	NIM	PER	LTD	ROA	ROE			
1	3.967 (0.180)	0.130 (0.242)						0.010	51.950	0.058
2	10.470 (0.548)		-0.444 (0.072)					0.010	51.964	0.005
3	-21.920 (1.950)			1.380 (3.081)**				0.079	49.618	9.493
4	-21.920 (1.950)				-1.260 (2.348)			0.044	50.563	5.511
5	20.673 (1.251)					-7.682 (0.740)		0.005	51.823	0.540
6	-1.257 (-0.090)						0.720 (0.800)	0.004	51.797	0.641
7	5.181 (0.176)	0.129 (0.238)	-0.393 (0.063)					0.020	52.216	0.031
8	-38.476 (-1.222)	0.181 (0.349)	-0.393 (0.063)	1.421 (3.097)**				0.063	50.047	3.220
9	-38.476 (-1.222)	0.148 (0.284)	-1.277 (0.201)	1.167 (2.118)	-0.540 (0.835)			0.060	50.126	2.581
10	79.765 (0.882)	0.219 (0.332)	-4.299 (0.631)	1.031 (1.837)	-0.838 (1.211)	-16.981 (1.196)		0.064	50.013	2.361
11	70.225 (0.767)	0.219 (0.332)	-4.774 (0.696)	0.968 (1.700)	-0.843 (1.216)	-19.630 (1.335)	0.720 (0.800)	0.059	50.142	2.043

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Stock return is the dependent variable.

Table 4 shows that the beta coefficients for operational efficiency are positive with stock return. It indicates that operational efficiency has a positive impact on stock return. This finding is similar to the findings of Ndinda and Mwai (2023). Similarly, the beta coefficients for net interest margin are negative with stock return. It indicates that net interest margin has a negative impact on stock return. This finding is consistent with the findings of Hongkong (2017). Likewise, the beta coefficients for price earnings ratio are positive with return on equity. It indicates that price earnings ratio has a positive impact on stock return. This finding is similar to the findings of Rahmadi (2020). Similarly, the beta coefficients for loan to deposit ratio are negative with stock return. It indicates that loan to deposit ratio has a negative impact on stock return. This finding is consistent with the findings of Yuhasril and Wahyono (2019). Similarly, the beta coefficients for return on assets are negative with stock return. It indicates that return on assets has a negative impact on stock return. This finding is similar to the findings of Har and Ghafar (2015).

Table 5 shows the estimated regression results of operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, and return on equity on earnings per share of Nepalese commercial banks.

Table 5

Estimated regression results of operational efficiency, net interest margin, price earnings ratio, loan to deposit ratio, return on assets, and return on equity on earnings per share of Nepalese commercial banks

The results are based on panel data of 10 commercial banks with 100 observations for the period of 2013/14-2022/23 by using the linear regression model and the model is $EPS_{it} = \beta_0 + \beta_1 OE + \beta_2 NIM + \beta_3 PER + \beta_4 LTD + \beta_5 ROA + \beta_6 ROE + e_{it}$ where, the dependent variable is EPS (Earnings per share as measured by the ratio of company's total earnings to the total number of shares outstanding, in Rs). The independent variables are OE (Operational efficiency as measured by the ratio of operational expenses to operational income, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), PER (Price earnings ratio is measured by the ratio of market value per share to earnings per share, in times), LTD (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), and ROE (Return on equity as measured by the ratio of net income to shareholder's equity, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		OE	NIM	PER	LTD	ROA	ROE			
1	41.377 (7.916)**	-0.345 (2.713)						0.060	12.303	7.361
2	15.760 (3.485)**		3.984 (2.720)*					0.061	12.300	7.397
3	18.802 (6.926)**			0.391 (3.610)**				0.108	11.984	13.029
4	84.805 (8.886)**				-0.698 (-6.034)			0.263	10.892	36.412
5	8.388 (2.386)*					12.804 (5.753)**		0.245	11.029	33.100
6	14.189 (4.542)**						0.927 (4.619)**	0.170	11.560	21.334
7	5.181 (0.176)	-0.129 (0.238)	-0.393 (-0.063)					0.020	52.216	0.031
8	-38.476 (1.222)	-0.181 (0.349)	2.832 (0.468)	1.421 (3.097)**				0.063	50.047	3.220
9	17.455 (0.236)	-0.148 (0.284)	1.277 (0.201)	1.167 (2.118)	-0.540 (0.835)			0.060	50.126	2.581
10	79.765 (0.882)	-0.311 (0.482)	4.299 (0.631)	1.031 (1.837)	-0.838 (1.211)	16.981 (1.196)		0.064	50.013	2.361
11	70.225 (0.767)	-0.219 (0.332)	4.774 (0.696)	0.968 (1.700)	-0.843 (1.216)	19.630 (1.335)	0.712 (0.717)	0.059	50.142	2.043

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Earnings per share is the dependent variable.

Table 5 shows that the beta coefficients for operational efficiency are negative with earnings per share. It indicates that operational efficiency has a negative impact on earnings per share. This finding is similar to the findings of Buchory (2015). Similarly, the beta coefficients for net interest margin are positive with earnings per share. It indicates that net interest margin has a positive impact on earnings per share. This finding is consistent with the findings of Hidayat *et al.* (2021). Similarly, the beta coefficients for price earnings ratio are positive with earnings per share. It indicates that price earnings ratio has a positive impact on earnings per share. This finding is similar to the findings of Amiputra *et al.* (2021). Similarly, the beta coefficients for loan to deposit ratio are negative with earnings per share. It indicates that the loan to deposit ratio has a negative impact on earnings per share. This finding is consistent with the findings of Susantih and Ompusunggu (2022). Similarly, the beta coefficients for return on assets are positive with earnings per share. It indicates that the return on assets has positive impact on earnings per share. This finding is consistent with the findings of Hayati *et al.* (2020). Likewise, the beta coefficients for return on equity are positive with earnings per share. It indicates that the return on equity has positive impact on earnings per share. This finding is consistent with the findings of Mudzakar (2021).

4. Summary and conclusion

Stock market has become an essential market playing a vital role in economic prosperity that fostering capital formation and sustainable economic growth. Stock markets operate as a facilitator between savers and users of capital by means of pooling of funds, sharing risk, and transferring wealth. Stock markets are essential for economic growth as they ensure the flow of resources to the most productive investment opportunities. Share price is a major determinant for the investment decision of investors in the share market because investors mainly focus on price of shares when they decide to invest in shares. However, share prices are fluctuating every day, which is dependent on various internal factors like dividend pay-out, dividend yield, dividend per share, sales growth, leverage, earnings volatility and firm size as well as external factors like exchange rate, inflation and GDP. Therefore, investors need to have knowledge and awareness about the factors which determine share price in order to make an optimum investment decision.

This study attempts to analyze the relationship between bank efficiency and stock return of Nepalese commercial banks. The study is based on secondary data of 10 commercial banks with 100 observations for the study period from 2013/14 to 2022/23.

The major conclusion of the study that operational efficiency, price earnings ratio and return on equity have positive effect on stock return of Nepalese commercial banks. Moreover, net interest margin, loan to deposit ratio and return on assets have negative effect on stock return of Nepalese commercial banks. However, operational efficiency and loan to deposit ratio have negative impact on return on equity. The study concluded that price earnings ratio is the most influencing factor that explains the changes in the stock return. Likewise, the study also concluded that the most dominant factor that determines the earnings per share is return on assets followed by return on equity, price earnings ratio and net interest margin in the context of Nepalese commercial banks.

References

- Adam, M., R. Safitri, and T. Wahyudi, 2018. Effect of company size, liquidity and operational efficiency on bank profitability with problem credit risk as a moderating variable at commercial banks that are listed on the Indonesia Stock Exchange. *Jurnal Perspektif Pembiayaan Dan Pembangunan Daerah* 6(3), 331-344.
- Alam, S., M. R. Miah, and M. A. Karim, 2016. Analysis on factors that affect stock prices: A study on listed cement companies at Dhaka stock exchange. *Research Journal of Finance and Accounting* 7(18), 93-113.
- Al-Lozi, N. M., and G. S. Obeidat, 2016. The relationship between the stock return and financial indicators

- (profitability, leverage): An empirical study on manufacturing companies listed in Amman Stock Exchange. *Journal of Social Sciences* 5(3), 408-424.
- Al-Qudah, A. A., 2016. The relationship between each of (return on equity and return on asset) and annual return in the Abu Dhabi Securities Exchange (ADX): Evidence from United Arab Emirates. *Research Journal of Finance and Accounting* 7(24), 100-109.
- Amatya, S., 2016. Effect of firm specific and macroeconomic variables on market price of shares and financial performance in commercial banks of Nepal. *Nepalese Journal of Business* 1(3), 102-115.
- Badruzaman, J., 2020. The impact of earnings per share and return on equity on stock price. *Systematic Reviews in Pharmacy* 11(6), 1285-1289.
- Bhatti, G. A., and H. Hussain, 2010. Evidence on structure conduct performance hypothesis in Pakistani commercial banks. *International Journal of Business and Management* 5(9), 174-187.
- Chowdhury, M. M., and S. Zaman, 2018. Effect of liquidity risk on performance of Islamic banks in Bangladesh. *IOSR Journal of Economics and Finance* 9(4), 1-9.
- Datta, C. K., and A. Al Mahmud, 2018. Impact of capital adequacy on profitability under Basel II accord: Evidence from commercial banks of Bangladesh. *European Journal of Business and Management* 10(8), 48-58.
- Dhillon, A. S., and H. Vachhrajani, 2012. Impact of operational efficiency on overall profitability-A case study of GIPCL. *Working Paper No. 136/2012*
- Fauzi, R. R., and D. Nizwan, 2021. The effect of financial ratios on stock returns in telecommunications companies. *Jurnal Riset Bisnis dan Manajemen* 14(2), 64-70.
- Golubeva, O., M. Duljic, and R. Keminen, 2019. The impact of liquidity risk on bank profitability: some empirical evidence from the European banks following the introduction of Basel III regulations. *Journal of Accounting and Management Information Systems* 18(4), 455-485.
- Har, W. P., and M. A. A. Ghafar, 2015. The impact of accounting earnings on stock returns: the case of Malaysia's plantation industry. *International Journal of Business and Management* 10(4), 155-162.
- Hardiyanti, W., B. Febriatmoko, and S. Wulandari, 2016. Effect of LDR and BOPO on ROA with NIM as the intervening variable: Studies on commercial banks in Indonesia for the period 2011-2013. *Dinamika Akuntansi, Keuangan dan Perbankan* 5(2), 155-166.
- Hatta, A. J., and B. S. Dwiyanto, 2012. The company fundamental factors and systematic risk in increasing stock price. *Journal of Economics, Business, and Accountancy Ventura* 15(2), 245-256.
- Hertina, D., and M. H. M. Saudi, 2019. Stock return: Impact of return on asset, return on equity, debt to equity ratio and earning per share. *International Journal of Innovation, Creativity and Change* 6(12), 93-104.
- Holthausen, R. W., and D. F. Larcker, 1992. The prediction of stock returns using financial statement information. *Journal of Accounting and Economics* 15(2-3), 373-411.
- Iskandar, Y., 2020. The influence of capital adequacy ratio, loan-to-deposit ratio, and net interest margin on stock return at commercial banks in Indonesia. *Jurnal Aplikasi Manajemen* 18(3), 533-538.
- Jabbari, E., and Z. Fathi, 2014. Prediction of stock returns using financial ratios based on historical cost, compared with adjusted prices (accounting for inflation) with neural network approach. *Indian Journal of Fundamental and Applied Life Sciences* 4(4), 1064-1078.
- Kabajeh, M. A. M., S. M. A. Al Nu'aimat, and F. N. Dahmash, 2012. The relationship between the ROA, ROE and ROI ratios with Jordanian insurance public companies market share prices. *International Journal of Humanities and Social Science* 2(11), 115-120.
- Kengatharan, L. 2018. Factors influencing share price of listed commercial banks in Sri Lanka. *Management Today* 8(1), 61-64.

- Lartey, V. C., S. Antwi, and E. K. Boadi, 2013. The relationship between net interest margin and return on assets of listed banks in Ghana. *Research Journal of Finance and Accounting* 4(16), 73-78.
- Lewellen, J., 2004. Predicting returns with financial ratios. *Journal of Financial Economics* 74(2), 209-235.
- Martinez, I., 1999. Fundamental and macroeconomic information for the security prices valuation: the French case. *Managerial Finance* 25(12), 17-30.
- Motamedi, P., 2013. Investigating different factors influencing on return of private banks. *Management Science Letters* 3(9), 2467-2472.
- Murniati, S., 2016. Effect of capital structure, company size and profitability on the stock price of food and beverage companies listed on the Indonesia Stock Exchange. *Information Management and Business Review* 8(1), 23-29.
- Musah, M., Y. Kong, and I. A. Mensah, 2019. Exploring the link between operational efficiency and firms' financial performance: Empirical evidence from the Ghana Stock Exchange (GSE). *International Journal of Trend in Scientific Research and Development* 3(4), 1-7.
- Nuhiu, A., A. Hoti, and M. Bektashi, 2017. Determinants of commercial banks profitability through analysis of financial performance indicators: evidence from Kosovo. *Business: Theory and Practice* 18(1), 160-170.
- Perdana, M. K., and C. H. Adriana, 2018. Factors influencing the stock price of banking companies in the Indonesia stock exchange. *Journal of Accounting and Strategic Finance* 1(1), 57-68.
- Purbaningsih, R. Y. P., and N. Fatimah, 2014. The effect of liquidity risk and non performing financing (NPF) ratio to commercial Sharia bank profitability in Indonesia. *International Journal of Business, Economics and Law* 16(1), 59-63.
- Puspitasari, E., B. Sudiyatno, N. Aini, and G. Anindiansyah, 2021. The relationship between net interest margin and return on asset: Empirical study of conventional banking in Indonesia. *Academic Journal of Interdisciplinary Studies* 10(3), 362-374.
- Schmidt, J. B., and R. A. Spreng, 1996. A proposed model of external consumer information search. *Journal of the Academy of Marketing Science* 24(1), 246-256.
- Shrestha, P. K., and B. R. Subedi, 2014. Determinants of stock market performance in Nepal. *NRB Economic Review* 26(2), 25-40.
- Subedi, A., and R. S. Pradhan, 2022. Determinants of market stock price movements in Nepalese Commercial Banks. *Management in New Millennium: A Perspective from an Emerging Economy of Nepal* 1(1), 3-18.
- Tandon, K., and N. Malhotra, 2013. Determinants of stock prices: Empirical evidence from NSE 100 companies. *International Journal of Research in Management and Technology* 3(3), 2249-9563.
- Uddin, M. K. 2022. Effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. *European Journal of Business and Management Research* 7(3), 289-295.
- Wagle, S., 2021. Determinant of stock market prices in Nepal: A case of Nepalese commercial banks. *SDMIMD Journal of Management* 12(2), 1-9.
- Widagdo, B., M. Jihadi, Y. Bachitar, O. E. Safitri, and S. K. Singh, 2020. Financial ratio, macro economy, and investment risk on Sharia stock return. *The Journal of Asian Finance, Economics, and Business* 7(12), 919-926.
- Yuhasril, Y., and T. Wahyono, 2019. The influence of loan to deposit ratio, capital adequacy ratio, and return on equity toward stock return in government-owned conventional banking company (BUMN) that registered in Indonesia Stock Exchange Period of 2010-2017. *The International Journal of Business and Management* 1(2), 715-726.

Chapter 19

Impact of fundamental factors on stock price of Nepalese commercial banks

- Ram Sagar Yadav*

Abstract

This study examines the impact of fundamental factors on stock price of Nepalese commercial banks. Market price of stock and stock return rate are selected as the dependent variables. The selected independent variables are price earnings ratio, return on equity, firm size, dividend per share, earning per share, and return on assets. The study is based on secondary data of 12 commercial banks listed in Nepal Stock Exchange with 108 observations for the study period from 2014/15 to 2022/23. The data were collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB), Nepal Stock Exchange, and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of fundamental factors on stock price of Nepalese commercial banks.

The study showed that price earnings ratio has a positive impact on market price of stock and stock return. It indicates that increase in price earnings ratio leads to increase in market price of stock and stock return. Similarly, return on equity has a positive impact on market price of stock and stock return. It indicates that increase in return on equity leads to increase in market price of stock and stock return. Likewise, firm size has a positive impact on market price of stock. It indicates that higher the firm size, higher would be the market price of stock. In contrast, firm size has a negative impact on stock return. It indicates that higher the firm size, lower would be the stock return. However, dividend per share has a positive impact on market price of stock and stock return. It indicates that increase in dividend per share leads to increase in market price of stock and stock return. Further, earning per share has a positive impact on market price of stock and stock return. It indicates that higher the earning per share, higher would be the market price of stock and stock return. In addition, return on assets has a positive impact on market price of stock and stock price. It indicates that increase in return on assets lead to increase in market price of stock and stock return.

Keywords: price earnings ratio, return on equity, firm size, dividend per share, earning per share, return on assets, market price of stock and stock return

1. Introduction

The dynamic and often unpredictable nature of stock prices has long intrigued scholars, investors, and market analysts alike. Understanding the factors that influence stock price movements is essential for making informed investment decisions, developing sound financial strategies, and crafting effective regulatory policies. Among the various fundamental factors of stock prices, such as price earnings ratio, return on equity, firm size, dividend per share earnings per share and return on equity play a pivotal role. These factors reflect the underlying financial health and performance of a company, providing crucial insights into its valuation and potential for growth. The banking sector, in particular, offers a compelling context for examining the impact of fundamental factors on stock prices (Allen *et al.*, 2008). Ambrosio (2007) explained that knowledge of such factors and their possible impact on share prices is highly appreciable as it would help investors make wise investment decisions and enable firms to enhance their market value. Banks are integral to the financial system, serving as intermediaries in the flow of capital, providers of credit, and facilitators of economic growth. The financial performance of banks is closely tied to macroeconomic conditions, regulatory environments, and market dynamics. Consequently, analyzing how fundamental factors influence bank stock prices can yield valuable insights into broader market trends and economic stability. The term “stock market” can also refer to the “stock exchange.” A stock exchange is a marketplace for various securities, such as shares, bonds, and stocks, as well as payment documents. Regarding randomness, the nature of the financial market, and particularly the stock exchange, means that prices are influenced by numerous

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outside factors that are impossible to fully control or predict (Mishura, 2016).

Fundamental analysis is a method used by investors and analysts to evaluate a stock's intrinsic value. It involves examining a company's financial statements, such as income statements, balance sheets, and cash flow statements, along with broader economic indicators like interest rates and inflation. The underlying assumption is that a company's true value will eventually be reflected in its stock price, even if market prices fluctuate in the short term due to other factors like market sentiment and speculative trading (Damodaran, 2012). The market's stock price fluctuates daily rather than remaining constant. According to Gompers *et al.* (2003), in the securities market, whether the primary or the secondary, stock price can be significantly influenced by a number of micro environmental factors including dividend per share, book value (asset value) of the firm, earnings per share, price earnings ratio and dividend cover etc. The key function of the stock market is to provide an exchange in which buyers and sellers interact for the purpose of trading shares and other securities issued by publicly traded companies (Monther & Kaothar, 2010). The micro economic factor also known as company fundamental factor such as company performance, top management changes, and creating new assets, dividends, earnings, etc. are also responsible for change in price of the stock. Similarly, Nasser (2007) stated that investors think about the company's past performance and prospects. The study stated the market ratio is a set of ratios that relate stock prices to earnings and book value per share.

Eprima Dewi *et al.* (2015) explained that earning per share is the first essential component that must be considered in the company's analysis. Financial statement data can be used to get a company's EPS number. Earnings per share is a ratio that shows how much profit (return) investors get per share. The greater the profit per share for the owner, as indicated by EPS. Pankaj (2017) examined the effect of price earnings ratio and earnings per share on the market price of the company's shares. The result of the study found that earning per share has found to be a very strong forecaster of market price of share, while price-earnings ratio has a major influence on forecasting the market price of shares of specific car industry corporations as a whole. Similarly, Hanifah (2019) examined the effect of earning per share, price earnings ratio and price book value on stock prices in Telecommunications sector companies included in the Indonesian Syariah Stock Index (ISSI) for the period 2013 to 2017. The study showed that price earnings ratio has no impact on stock price. Likewise, Mudzakar (2021) analyzed the impact of price earnings ratio, earnings per share, return on equity, and return on asset on stock return. The result revealed that partial return on asset and earnings per share have no impact on stock returns, whereas return on equity and price earnings ratios have a significant impact on stock returns, simultaneously return on asset, return on equity, earnings per share, and price earnings ratio have positive impact on stock returns.

Ratnasari and Ramdhani (2022) examined the effect of return on equity (ROE) and debt to equity ratio (DER) on stock prices on insurance sub sector companies listed on the Indonesia stock exchange (IDX). The study showed that there is a positive relationship between return on equity and stock price. Similarly, Lumapow and Tumiwa (2017) analyzed the determinants of dividend policy, firm size, and productivity on firm value. The study found that firm size has a positive and significant impact on stock price. Likewise, Arsal (2021) assessed the impact of earnings per share (EPS) and dividends per share (DPS) on the value of the company on the Indonesian stock exchange for the period 2014 to 2017. The findings of the study concluded that firm value has affected by dividend per share. Further, Koleosho *et al.* (2022) examined the effect of dividend policy on share price volatility of some selected companies on the Nigerian Exchange. The study revealed a noteworthy correlation between the dividend policy and the volatility of share prices (SPV). In addition, Martina *et al.* (2019) analyzed the effect of quick ratio, debt to equity ratio, earning per share, price to book value ratio and return on equity on stock returns with money supply as a moderation variable. The study revealed that return on equity has a positive impact on stock price. Moreover, Monica and Hasanuh (2020) investigated the

effect of return on assets, return on equity, and earning per share on stock price. The results showed that there is a positive impact of return on equity on stock price. Similarly, Yanto *et al.* (2021) examined the impact of return on asset, return on equity, net profit margin, debt equity ratio and current ratio toward stock price. The study concluded that return on equity has a positive influence toward stock price. Likewise, Saputra (2022) assessed the effect of return on assets, return on equity, and price earnings ratio on the stock prices of coal companies listed on the Indonesia Stock Exchange (IDX). The result of the study showed that return on assets, return on equity, and price earnings ratio have significant impact on Stock prices.

In the context of Nepal, Bhattarai (2018) assessed the impact of macroeconomic and firm-specific factors on the share prices of insurance and commercial banks in Nepal. The study revealed that return on assets affecting the share prices of banks and insurances companies in Nepalese context. Similarly, Amatya (2016) examined the effect of firm specific and macroeconomic variables on market price of shares and financial performance in commercial banks of Nepal. The study found that direct correlation between the market price per share and dividend per share, return on assets, price-earnings ratio, gross domestic product and earnings per share. Likewise, Lama (2016) investigated the effect of firm specific and macroeconomic variables on stock price of Nepalese commercial banks. The study showed that there is a positive association between market price per share and many factors such as size, profits per share, dividends per share, return on assets, money supply, inflation, and gross domestic product. Further, Gautam (2017) examined the impact of firm specific variables on stock price volatility and stock return in context of Nepalese commercial banks over the period of 2008/09 to 2015/16. The study revealed that price earnings ratio has a negative impact on stock price volatility. In addition, Karki (2018) analyzed the fundamentals of common stock pricing: Evidence from commercial banks of Nepal. The study stated that earnings per share and stock dividend per share are the more significant determinants of stock prices of commercial banks in Nepal. Moreover, Goet and Kharel (2022) examined the impact of variables such as dividends per share, earnings per share, price-earnings ratio, and net worth per share on the market price per share of Nepalese commercial banks. The study showed that there is a significant and positive relationship between dividend per share and market price per share.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of fundamental factors on stock price of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of fundamental factors on stock price of Nepalese commercial banks. Specifically, it examines the relationship of price earnings ratio, return on equity, firm size, dividend per share, earning per share, and return on assets with stock price of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 12 Nepalese commercial banks from 2014/15 to 2022/23, leading to a total of 108 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB), Nepal Stock Exchange, and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1

shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	Observations
1	Agriculture Development Bank Limited	2014/15-2022/23	9
2	Everest Bank Limited	2014/15-2022/23	9
3	Himalayan Bank Limited	2014/15-2022/23	9
4	Machhapuchhre Bank Limited	2014/15-2022/23	9
5	Nepal Bank Limited	2014/15-2022/23	9
6	NMB Bank Limited	2014/15-2022/23	9
7	Prime Commercial Bank Limited	2014/15-2022/23	9
8	Sanima Bank Limited	2014/15-2022/23	9
9	SBI Bank Limited	2014/15-2022/23	9
10	Siddhartha Bank Limited	2014/15-2022/23	9
11	Standard Chartered Bank Limited	2014/15-2022/23	9
12	Citizens Bank International Limited	2014/15-2022/23	9
Total number of observations			108

Source: Annual Reports of the Banks

Thus, the study is based on the 108 observations.

The model

The model used in this study assumes that stock price depends upon fundamental factors of stock market. The dependent variables selected for the study are market price of stock and stock return. Similarly, the selected independent variables are price earnings ratio, return on equity, firm size, dividend per share, earning per share, and return on assets. Therefore, the models take the following forms:

$$MPS_{it} = \beta_0 + \beta_1 PE_{it} + \beta_2 ROE_{it} + \beta_3 FS_{it} + \beta_4 DPS_{it} + \beta_5 EPS_{it} + \beta_6 ROA_{it} + e_{it}$$

$$SR_{it} = \beta_0 + \beta_1 PE_{it} + \beta_2 ROE_{it} + \beta_3 FS_{it} + \beta_4 DPS_{it} + \beta_5 EPS_{it} + \beta_6 ROA_{it} + e_{it}$$

Where,

MPS = Market price of stock measured by the year end price of the stock, in Rs.

SR = Stock return is measured by differences of current year price and last year price divided by last year price, in percentage.

PE = Price earnings ratio as measured by the year end price divided by earning per share, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

FS = Firm size as measured by the total asset of the firm, Rs. in billions.

DPS = Dividend per share as measured by the ratio of total dividend distributed to shareholder's divided by number of share outstanding, in Rs.

EPS = Earnings per share as measured by the net income divided by number of share outstanding, in

Rs.

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

The following section describes the independent variables used in this study along with hypothesis formulation.

Price earnings ratio

According to Tryfino (2009), the earning price ratio is a ratio that showed the comparison between share price and net income for each outstanding share. Furthermore, the price-earnings ratio (PER) is used to determine a stock's ability to turn a profit as well as the rate of return on money invested in it. Safitri and Wiyono (2021) found that price earnings ratio has a positive and significant impact on stock prices. Likewise, Ramadhani (2012) concluded that price earnings ratio significantly affecting the stock prices. Further, Riadi (2011) showed that increase in price earnings ratio leads to increase in stock prices. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between price earnings ratio and stock price.

Return on equity

Return on equity is a measure of a company's financial performance. It is computed by dividing net income by equity held by shareholders. Similarly, Talamati *et al.* (2015) showed that return on equity has a significant and positive impact on stock price. Likewise, Lusiana (2015) revealed that return on equity has a positive and significant impact on stock prices. Further, Ratnasari and Ramdhani (2022). Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between return on equity and stock price.

Firm size

Widjaja (2009) stated that firm size (the size of the company) as measured by total assets positive and significant impact on the prospects of the company's shares. Similarly, Wiliandri (2011) concluded that greater the size of a company which can be seen from the total assets of a company, the company's stock price higher. Conversely, the share price will be much lower if the smaller companies are larger. Likewise, Sukesti *et al.* (2021) stated that firm size, as measured by market value of equity, has a negative but significant impact on stock returns. Further, Ernayani and Robiyanto (2016) found that firm size has a positive impact on price of the stock. In addition, Sudarsono and Sudiyatno (2016) showed that firm size has a positive impact on stock return. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between firm size and stock price.

Dividend per share

Stock dividend per share of a firm may be defined as total stock dividends divided by the number of outstanding shares. Chijoke-Mgbame (2011) found that there is a significant impact of dividend policy on stock prices. Similarly, Gordon (1962) found that even in cases where the necessary rate of return and the internal rate of return are equal, there is a clear correlation between the dividend policy and market value of the share. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between dividend per share and stock price.

Earnings per share

Profitability reflects the company's net profit. For investors the profitability of the company is usually expressed as earnings per share. Kumar (2017) found that earnings per share has a positive

impact on market price of share. Similarly, Malakar and Gupta (2002) showed that earnings per share has a significant impact on stock price. Likewise, Bhatt and Sumangala (2012) discovered that earning per share has a significant impact on market value of an equity share. Further, Basu (1977) found that even after controlling for risk, portfolios of low-price earnings ratio companies typically yield larger returns than portfolios of higher-price earnings ratio equities. Based on it, this study develops the following hypothesis:

H₅: Earning per share has a positive relationship with stock price.

Return on assets

Diaz and Jufrizen (2014) concluded that return on assets affects stock prices. Similarly, Purnamasari (2015) examined the effect of changes in return on assets, return on equity, and economic value added to the stock price changes and its impact on earnings per share. The study showed that return on assets has a positive and significant impact on stock price. Likewise, Saputra (2022) revealed that there is a positive and significant relationship between return on assets and stock price. Further, Choiriyah *et al.* (2020) assessed the effect of return on assets, return on equity, net profit margin, earning per share, and operating profit margin on stock prices of banking companies in Indonesia Stock Exchange. The study concluded that return on assets has a positive and significant impact on stock price. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between return on assets and stock price.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2014/15 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are MPS (Market price of stock measured by the year end price of the stock, in Rs.) and SR (Stock return is measured by differences of current year price and last year price divided by last year price, in percentage). The independent variables are PE (Price earnings ratio as measured by the year end price divided by earning per share, in percentage), ROE (Return on equity as measured by the ratio of net income to total equity, in percentage), FS (Firm size as measured by the total asset of the firm, Rs. in billions), DPS (Dividend per share as measured by the ratio of total dividend distributed to shareholder's divided by number of share outstanding, in Rs.), EPS (Earnings per share as measured by the net income divided by number of share outstanding, in Rs.), and ROA (Return on assets as measured by the ratio of net income to total assets, in percentage).

Variables	Minimum	Maximum	Mean	Std. Dev
MPS	173.1	3600	568.13	546.61
SR	-0.67	1.11	-0.05	0.37
PE	3.87	83.94	21.05	12.28
ROE	0.04	0.43	0.14	0.0527
FS	40.3	332.39	139.94	66.34
DPS	0	78.04	5.19	8.75
EPS	5.3	111.77	26.46	13.56
ROA	0.47	3.57	1.59	0.53

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed

and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are MPS (Market price of stock measured by the year end price of the stock, in Rs.) and SR (Stock return is measured by differences of current year price and last year price divided by last year price, in percentage). The independent variables are PE (Price earnings ratio as measured by the year end price divided by earning per share, in percentage), ROE (Return on equity as measured by the ratio of net income to total equity, in percentage), FS (Firm size as measured by the total asset of the firm, Rs. in billions), DPS (Dividend per share as measured by the ratio of total dividend distributed to shareholder's divided by number of share outstanding, in Rs.), EPS (Earnings per share as measured by the net income divided by number of share outstanding, in Rs.), and ROA (Return on assets as measured by the ratio of net income to total assets, in percentage).

Variables	MPS	SR	PE	ROE	FS	DPS	EPS	ROA
MPS	1							
SR	0.299**	1						
PE	0.832**	0.260**	1					
ROE	0.342**	0.198*	0.004	1				
FS	0.333**	-0.022	-0.201*	-0.530**	1			
DPS	0.302**	0.013	0.070	0.072	0.039	1		
EPS	0.472**	0.115	0.047	0.604**	-0.342**	-0.408**	1	
ROA	0.210*	0.053	-0.168	0.673**	-0.481**	-0.083	0.724**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 3 shows that there is a positive relationship between price earnings ratio and market price of stock. It indicates that increase in price earnings ratio leads to increase in market price of stock. Similarly, there is a positive relationship between return on equity and market price of stock. It indicates that higher the return on equity, higher would be the market price of stock. Likewise, firm size has a positive relationship with market price of stock. It indicates that increase in firm size leads to increase in market price of stock. In addition, there is a positive relationship between dividend per share and market price of stock. It indicates that increase in dividend per share leads to increase in market price of stock. Further, earning per share has a positive relationship with market price of stock. It indicates that that higher the earning per share, higher would be the market price of stock. Moreover, there is a positive relationship between return on asset and market price of stock. It indicates that higher the return on assets, higher would be the market price of stock.

Similarly, the result also shows that there is a positive relationship between price earnings ratio and stock return. It indicates that increase in price earnings ratio leads to increase in stock return. Similarly, there is a positive relationship between return on equity and stock return. It indicates that higher the return on equity, higher would be the stock return. However, firm size has a negative relationship with stock return. It indicates that increase in firm size leads to decrease in stock return. In contrast, there is a positive relationship between dividend per share and stock return. It indicates that increase in dividend per share leads to increase in stock return. Further, earning per share has a positive relationship with stock return. It indicates that that higher the earning per share, higher would be the stock return. Moreover, there is a positive relationship between return on asset and stock return. It indicates that higher the return on assets, higher would be the stock return.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been

carried out and results are presented in Table 4. More specifically, it shows the regression results of price earnings ratio, return on equity, firm size, dividend per share, earning per share, and return on assets with market price of stock of Nepalese commercial banks.

Table 4

Estimated regression results of price earnings ratio, return on equity, firm size, dividend per share, earning per share, and return on assets with market price of stock

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15 to 2022/23 by using linear regression model. The model is $MPS_{it} = \beta_0 + \beta_1 PE_{it} + \beta_2 ROE_{it} + \beta_3 FS_{it} + \beta_4 DPS_{it} + \beta_5 EPS_{it} + \beta_6 ROA_{it} + e_{it}$ where, the dependent variable is SR (Stock return is measured by differences of current year price and last year price divided by last year price, in percentage). The independent variables are PE (Price earnings ratio as measured by the year end price divided by earning per share, in percentage), ROE (Return on equity as measured by the ratio of net income to total equity, in percentage), FS (Firm size as measured by the total asset of the firm, Rs. in billions), DPS (Dividend per share as measured by the ratio of total dividend distributed to shareholder's divided by number of share outstanding, in Rs.), EPS (Earnings per share as measured by the net income divided by number of share outstanding, in Rs.), and ROA (Return on assets as measured by the ratio of net income to total assets, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		PE	ROE	FS	DPS	EPS	ROA			
1	-211.349 (3.62)**	37.026 (15.439)**						0.689	304.69	238.355
2	65.37 (0.457)		3548.922 (0.342)					0.109	516.02	14.062
3	951.971 (8.153)**			2.743 (0.635)				0.102	517.86	13.210
4	470.205 (8.015)**				18.854 (3.259)**			0.082	523.58	10.690
5	64.45 (0.628)					11.952 (6.660)**		0.215	484.15	30.390
6	228.398 (1.408)						212.99 (2.210)*	0.035	536.96	4.880
7	-708.01 (9.063)**	36.97 (19.370)**	3514.76 (7.910)**					0.803	242.38	219.600
8	-749.82 (5.360)**	37.14 (15.850)**	3623.103 (6.830)**	0.163 (0.379)				0.802	243.37	145.250
9	-721.096 (6.110)**	36.18 (21.016)**	3295.590 (7.093)**	0.082 (0.219)	13.884 (5.870)**			0.85	211.7	152.580
10	-788.14 (7.920)**	36.117 (25.001)**	1632.201 (3.530)**	0.086 (0.271)	7.005 (3.130)**	11.952 (6.660)**		0.894	177.62	182.261
11	-870.904 (7.304)**	36.84 (23.740)**	1469.23 (3.064)**	0.204 (0.620)	7.683 (3.340)**	10.234 (4.540)**	72.68 (1.25)	0.895	177.13	152.990

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Market price of stock is the dependent variable.

Table 4 shows that the beta coefficients for price earnings ratio are positive with market price of stock. It indicates that price earnings ratio has a positive impact on market price of stock. This finding is similar to the findings of Safitri and Wiyono (2021). Similarly, the beta coefficients for return on equity are positive with market price of stock. It indicates that return on equity has a positive impact on market price of stock. This finding is consistent with the findings of Talamati *et al.* (2015). Likewise, the beta coefficients for firm size are positive with market price of stock. It indicates that firm size has a positive impact on market price of stock. This finding is similar to the findings of Ernayani and Robiyanto (2016). Further, the beta coefficients for dividend per share are positive with market price of stock. It indicates that dividend per share has a positive impact on market price of stock. This finding is consistent with the findings of Chijoke-Mgbame (2011). In addition, the beta coefficients for earning per share are positive with market price of stock. It indicates that earning per share has a positive impact on market price of stock. This finding is similar to the findings of Kumar (2017). Moreover,

the beta coefficients for return on assets are positive with market price of stock. It indicates that return on assets has a positive impact on market price of stock. This finding is similar to the findings of Purnamasari (2015).

Table 5 shows the regression results of price earnings ratio, return on equity, firm size, dividend per share, earning per share, and return on assets with stock return of Nepalese commercial banks.

Table 5

Estimated regression results of price earnings ratio, return on equity, firm size, dividend per share, earning per share, and return on assets with stock return

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15 to 2022/23 by using linear regression model. The model is $SR_{it} = \beta_0 + \beta_1 PE_{it} + \beta_2 ROE_{it} + \beta_3 FS_{it} + \beta_4 DPS_{it} + \beta_5 EPS_{it} + \beta_6 ROA_{it} + e_{it}$ where, the dependent variable is MPS (Market price of stock measured by the year end price of the stock, in Rs.). The independent variables are PE (Price earnings ratio as measured by the year end price divided by earning per share, in percentage), ROE (Return on equity as measured by the ratio of net income to total equity, in percentage), FS (Firm size as measured by the total asset of the firm, Rs. in billions), DPS (Dividend per share as measured by the ratio of total dividend distributed to shareholder's divided by number of share outstanding, in Rs.), EPS (Earnings per share as measured by the net income divided by number of share outstanding, in Rs.), and ROA (Return on assets as measured by the ratio of net income to total assets, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		PE	ROE	FS	DPS	EPS	ROA			
1	-0.224 (3.180)**	0.008 (2.780)**						0.059	0.367	7.650
2	-0.256 (2.480)*		1.420 (2.070)*					0.03	0.373	4.310
3	-0.038 (0.438)			-0.020 (0.225)				0.009	0.380	0.051
4	-0.058 (1.360)				0.001 (0.137)			0.009	0.380	0.019
5	-0.14 (1.750)					0.003 (1.190)		0.009	0.380	0.019
6	-0.114 (0.993)						0.037 (0.542)	0.007	0.380	0.293
7	-0.423 (3.630)**	0.008 (2.810)**	1.413 (2.130)*					0.089	0.360	6.225
8	-0.713 (3.580)**	0.009 (3.172)**	2.163 (2.773)**	-0.001 (1.782)				0.107	0.358	5.290
9	0.716 (3.560)**	0.009 (3.184)**	2.202 (2.791)**	-0.001 (1.809)	0.002 (0.407)			0.100	0.359	3.981
10	-0.716 (3.540)**	0.009 (3.170)**	2.201 (2.338)*	-0.001 (1.790)	0.002 (0.360)	0.011 (0.001)		0.091	0.360	3.150
11	-0.709 (2.904)**	0.009 (2.908)**	2.214 (2.253)*	-0.001 (1.690)	0.002 (0.361)	0.006 (0.031)	0.037 (0.542)	0.082	0.363	2.600

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Stock return is the dependent variable.

Table 5 shows that the beta coefficients for price earnings ratio are positive with stock return. It indicates that price earnings ratio has a positive impact on stock return. This finding is similar to the findings of Ramadhani (2012). Similarly, the beta coefficients for return on equity are positive with stock return. It indicates that return on equity has a positive impact on stock return. This finding is consistent with the findings of Lusiana (2015). However, the beta coefficients for firm size are negative with stock return. It indicates that firm size has a negative impact on stock return. This finding is not similar to the findings of Sudarsono and Sudiyatno (2016). In contrast, the beta coefficients for dividend per share are positive with stock return. It indicates that dividend per share has a positive impact on stock return. This finding is consistent with the findings of Gordon (1962). In addition, the beta coefficients for earning per share are positive with stock return. It indicates that earning per share

has a positive impact on stock return. This finding is similar to the findings of Basu (1977). Moreover, the beta coefficients for return on assets are positive with stock return. It indicates that return on assets has a positive impact on stock return. This finding is similar to the findings of Saputra (2022).

4. Summary and conclusion

The dynamic and often unpredictable nature of stock prices has long intrigued scholars, investors, and market analysts alike. Understanding the factors that influence stock price movements is essential for making informed investment decisions, developing sound financial strategies, and crafting effective regulatory policies. Among the various fundamental factors of stock prices, such as price earnings ratio, return on equity, firm size, dividend per share earnings per share and return on equity play a pivotal role. These factors reflect the underlying financial health and performance of a company, providing crucial insights into its valuation and potential for growth. The banking sector, in particular, offers a compelling context for examining the impact of fundamental factors on stock prices.

This study attempts to examine the impact of fundamental factors on stock price of Nepalese commercial banks. The study is based on secondary data of 12 Nepalese commercial banks with 108 observations for the period from 2014/15 to 2022/23.

The major conclusion of this study is that market price of stock and stock return for Nepalese commercial banks are positively impacted by a number of basic factors. The price-earnings ratio, return on equity, firm size, dividend per share, earnings per share, and return on assets have positive impact on market price of stock. It indicates that these indicators of a firms are critical indicator for stock price. Similarly, price-earnings ratio, return on equity, dividend per share, earnings per share, and return on assets have positive impact on stock return. However, firm size has a negative impact on stock return. The study also concluded that price earning ratio followed by earnings per share is the most influencing factor that explain the changes in the market price of stock in the context of Nepalese commercial banks. Similarly, the study also concluded that price earnings ratio followed by return on equity is the most influencing factor that explain the changes in the stock return in the context of Nepalese commercial banks

References

- Allen, F., E. Carletti, R. Cull, J. Q. Qian, L. Senbet, and P. Valenzuela, 2008. Improving access to banking: Evidence from Kenya. *Review of Finance* 25(2), 403-447.
- Amatya, S., 2016. Effect of firm specific and macroeconomic variables on market price of shares and financial performance in commercial banks of Nepal. *Nepalese Journal of Business* 1(3), 102-115.
- Ambrosio, F. J., 2007. *An evaluation of risk metrics*. Vanguard, Investment Counseling.
- Arsal, M., 2021. Impact of earnings per share and dividend per share on firm value. *Jurnal Ilmiah Akuntansi* 4(1), 11-18.
- Basu, S., 1977. Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis. *Journal of Finance* 3(2), 663-682.
- Bhatt, P., and J. K. Sumangala, 2012. Impact of earnings per share on market value of an equity share: An Empirical study in Indian capital market, *Journal of Finance, Accounting and Management* 3(2), 1-14.
- Bhattarai, Y. R., 2014. Determinants of share price of Nepalese commercial banks. *Economic Journal of Development* 17(1), 1-12.
- Chijoke-Mgbame, A. M., 2011. Dividend policy and share price volatility: UK Evidence. *Journal of Risk Finance* 12(1), 57-68.
- Choiriyah, C., F. Fatimah, S. Agustina, & U. Ulfa, 2020. The effect of return on assets, return on equity, net profit margin, earning per share, and operating profit margin on stock prices of banking companies in

- Indonesia Stock Exchange. *International Journal of Finance Research* 1(2), 103-123.
- Damodaran, A., 2012. Investment valuation: Tools and techniques for determining the value of any asset. *John Wiley and Sons* 6(1), 150-954.
- Diaz, R., & J. Jufrizen, 2014. Pengaruh Return on Assets (ROA) Dan Return on Equity (Roe) Terhadap Earning per Share (EPS) pada Perusahaan Asuransi yang Terdaftar di Bursa Efek Indonesia. *Jurnal Manajemen Dan Bisnis* 14(02), 127-134.
- Eprima Dewi, L., N. S. Herawati, and L. S. Sulindawati, 2015. Analisis pengaruh NIM, BOPO, LDR, DAN NPL terhadap profitabilitas (studi kasus pada bank umum swasta nasional yang terdaftar pada bursa efek Indonesia period 2009-2013). *E-Jurnal SI Ak* 3(1), 1-11.
- Ernayani, R., and R. Robiyanto, 2015. The effect of the cash flows, gross profit and company size on Indonesian stock returns (A study on the chemical and basic industry companies during the periods of 2009-2014). *IJABER* 14(1), 339-351.
- Gautam, R., 2017. Impact of firm specific variables on stock price volatility and stock returns of Nepalese commercial banks. *SAARJ Journal on Banking & Insurance Research* 6(6), 10-27.
- Goet, J., & K. Kharel, 2022. Factors influencing stock price variability of commercial banks in Nepal. *The Journal of Economic Concerns* 13(1), 82-92.
- Gompers, P. A., L. I. Joy, and M. Andrew, 2003. Corporate governance and equity prices. *Quarterly Journal of Economics* 118(1), 107-155.
- Gordon, M. J., 1962. The investment, financing, and valuation of the corporation. Illinois: *Irwin Publishers* 4(1), 63-71.
- Hanifah, A., 2019. The effect of earning per share (EPS), price earnings ratio (PER) and price book value (PBV) against the stock price of telecommunications sector company included in the Indonesian Islamic Stock Index (ISSI). *KnE Social Sciences* 3(2), 711-726.
- Karki, D., 2018. Fundamentals of common stock pricing: Evidence from commercial banks of Nepal. *SAARJ Journal on Banking & Insurance Research* 7(1), 4-32.
- Koleosho, A. O., I. R. Akintoye, and A. T. Ajibade, 2022. The effect of dividend policy on share price volatility of some selected companies on the Nigerian exchange. *Journal of Accounting, Business and Finance Research* 15(1), 10-20.
- Kumar, P., 2017. Impact of earning per share and price earnings ratio on market price of share: a study on auto sector in India. *International Journal of Research* 5(2), 113-118.
- Lama, M., 2016. The effect of firm specific and macroeconomic variables on stock price of Nepalese commercial banks. *Nepalese Journal of Business* 3(4), 83-98.
- Lumapow, L. S., and R. A. F. Tumiwa, 2017. The effect of dividend policy, firm size, and productivity to the firm value. *Research Journal of Finance and Accounting* 8(22), 20-24.
- Lusiana, H., 2020. The effect of return on equity (ROE) and earning per share (EPS) on Stock prices in Indonesia stock exchange 2015-2018. *Ilomata International Journal of Tax and Accounting* 1(3), 132-138
- Malakar, B., and R. Gupta, 2002. Determinants of share price-A system approach: The modified model. *Finance India* 16(4), 1409-1418.
- Martina, S., I. Sadalia, and R. Bukit, 2019. The effect of quick ratio, debt to equity ratio, earning per share, price to book value and return on equity on stock return with money supply as moderated variables (Study of Banking Companies Listed on Indonesia Stock Exchange Period 2008-2017). *International Journal of Public Budgeting, Accounting and Finance* 2(3), 1-10.
- Mishura, Y., 2016. Finance mathematics. *Elsevier* 4(1), 171-175.
- Monica, N. C., and N. Hasanuh, 2020. The Effect of Return on Assets, Return on Equity and Earning Per Share on Stock Price. *Jurnal Ilmiah Manajemen, Ekonomi, & Akuntansi (MEA)* 4(3), 1506-1515.

- Monther, C., and G. Kaothar, 2010. Macroeconomic and institutional determinants of stock market development. *The International Journal of Banking and Finance* 7(1), 139-141.
- Mudzakar, M. K., 2021. The effect of return on asset, return on equity, earning per share, and price earnings ratio toward stock return (Empirical study of transportation). *Turkish Journal of Computer and Mathematics Education* 12(8), 387-392.
- Nasser, E. M., 2007. Perbandingan kinerja bank pemerintah dan bank swasta dengan rasio CAMEL serta pengaruhnya terhadap harga saham. *Media Riset Akuntansi, Auditing & Informasi* 3(3), 217-236.
- Pankaj, K. P., 2017. Impact of earning per share and price earnings ratio on market price of share: a study on auto sector in India. *International Journal of Research* 5(2), 113-118.
- Purnamasari, D., 2015. The effect of changes in return on assets, return on equity, and economic value added to the stock price changes and its impact on earnings per share. *Research Journal of Finance and Accounting* 6(6), 80-90.
- Ramadhani, G., 2012. Analisis faktor-faktor yang mempengaruhi price earnings ratio pada perusahaan manufaktur yang terdaftar di Bursa efek Indonesia. *IJEBA* 5(2), 2007-2011.
- Ratnasari, I., and I. Ramadhani, 2022. The effect of return on assets (ROA) and debt to equity ratio (DER) on stock prices on insurance sub sector companies listed on the Indonesia stock exchange (IDX) period 2014-2018. *Management Research and Behavior Journal* 2(1), 37-43.
- Riadi, E. D., 2011. Pengaruh faktor debt to equity ratio, return on equity dan total assets terhadap price earnings ratio (PER) pada perusahaan otomotif dan komponen yang terdaftar di bursa efek Indonesia (BEI). *Jurnal Manajemen* 2(01), 54-88.
- Safitri, N. I., and G. Wiyono, 2021. Factors affecting price earnings ratio as one of the decision criteria for manufacturing company shares investment in Indonesia Stock exchange (2013-2018 Period). *International Journal of Economics, Business and Accounting Research (IJEBA)* 5(1), 515-524.
- Saputra, F., 2022. Analysis effect Return on Assets (ROA), Return on Equity (ROE) and Price Earnings Ratio (PER) on stock prices of coal companies in the Indonesia Stock Exchange (IDX) Period 2018-2021. *Dinasti International Journal of Economics, Finance & Accounting* 3(1), 82-94.
- Saputra, F., 2022. Analysis effect return on assets (ROA), return on equity (ROE) and price earnings ratio (PER) on stock prices of coal companies in the Indonesia Stock Exchange (IDX) Period 2018-2021. *Dinasti International Journal of Economics, Finance & Accounting* 3(1), 82-94.
- Sudarsono, B., and B. Sudiyatno, 2016. FaktorFaktor yang mempengaruhi return saham pada perusahaan property dan real estate yang terdaftar pada bursa efek Indonesia tahun 2009 S/D 2014. *Jurnal Bisnis dan Ekonomi* 23(1), 30-51.
- Sukesti, F., I. Ghazali, F. U. A. D. Fuad, A. Kharis Almasyhari, and N. Nurcahyono, 2021. Factors affecting the stock price: The role of firm performance. *The Journal of Asian Finance, Economics and Business* 8(2), 165-173.
- Talamati, M., R. Sifrid, and S. Pangemanan, 2015. The effect of earning per share (EPS) & return on equity (ROE) on stock price of banking company listed in Indonesia stock exchange (IDX) 2010-2014. *Jurnal EMBA* 3(2), 1068-1094.
- Tryfino, T., 2009. Analisis investasi. Jakarta: *PT Elex Media Komputindo* 2(2), 93-108.
- Widjaja, I., 2009. Effect of firm size and structure of prospect capital stock Company. *Journal of Organization and Management* 2(1), 21-30.
- Wiliandri, R., 2011. Effect of block holder ownership and firm size of corporate debt policy. *Journal of Business Economics* 16(2), 95-102.
- Yanto, E., I. Christy, and P. A. Cakranegara, 2021. The influences of return on asset, return on equity, net profit margin, debt equity ratio and current ratio toward stock price. *International Journal of Science, Technology & Management* 2(1), 300-312.

Part VI:

Risk Management

Chapter 20

Impact of credit risk, interest rates and monetary policy on profitability of Nepalese commercial banks

- Astika Mahato and Nar Bahadur Bista, Ph.D.*

Abstract

This study examines the impact of credit risk, interest rates and monetary policy on the financial performance of Nepalese commercial banks. Return on assets and return on equity are the selected dependent variables. The selected independent variables are non-performing loan, loan loss provision, interest rate spread, loan to deposit ratio, cash reserve ratio and statutory liquidity ratio. The study is based on secondary data of 12 commercial banks with 108 observations for the study period from 2014/15 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of credit risk, interest rates and monetary policy on the financial performance Nepalese commercial banks.

The study reveals that interest rate spread has a positive effect on return on assets and return on equity. It indicates that increase in interest rate spread lead to increase in return on assets and return on equity. Likewise, statutory liquidity ratio has a positive effect on return on assets and return on equity. It indicates that higher the statutory liquidity ratio, higher would be the return on assets and return on equity. In addition, cash reserve ratio has a positive effect on return on assets and return on equity. It indicates that higher the cash reserve ratio, higher would be the return on assets and return on equity. However, loan to deposit ratio has a negative effect on return on assets. It indicates that higher the loan to deposit ratio, lower would be the return on assets. Moreover, loan loss provision has a negative effect on return on assets. It indicates that increase in loan loss provision to total loan leads to decrease in return on assets. In addition, non-performing loan has a negative effect on return on assets. It indicates that increase in non-performing loan leads to decrease in return on assets.

Keywords: non-performing loans, loan loss provision, interest rate spread, loan-to-deposit ratio, cash reserve ratio, statutory liquidity ratio, return on assets, return on equity

1. Introduction

The banking sector is treated as the leading driving force of an economy. The success and failure of a bank are measured by profitability performance. Poor bank performance will lead to failure and lead to financial crises that will have negative consequences for economic development. Profit is one of the main goals of the banking industry. By evaluating profitability performance, it is merely easy to measure the efficiency and effectiveness of a bank's resource utilization during a specific period of time (Simatele et al., 2018). The strong profitability of a bank shows a higher capacity to earn profit and a bigger contribution to the economic growth of a country (Ani et al., 2012). Banks are essential to the financial sector, providing a wide range of services to individuals, businesses, and governments. They are pivotal in enabling transactions, mitigating risks, and channeling savings. Beyond accepting deposits, extending loans, issuing credit and debit cards, and offering various investment products, banks also deliver numerous additional services (Albertazzi and Gambacorta, 2019). Acting as intermediaries between the central bank and other financial institutions, they play a significant role in shaping the monetary policy of many countries. The financial strength and stability of a bank are closely tied to its profitability. By managing the flow of money, setting interest rates, and adjusting lending conditions, they help regulate the money supply, control inflation, and influence economic activity. Through their interactions with the central bank, they can impact the overall stability of the financial system, ensure liquidity, and facilitate credit allocation within the economy. The financial strength and stability of a

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bank are intrinsically linked to its profitability, as it determines the institution's ability to absorb shocks, meet regulatory capital requirements, and maintain investor and customer confidence. Profitable banks are better positioned to support economic growth by providing loans, enhancing their capital reserves, and managing risks effectively. Therefore, the performance of banks plays a vital role in not only their own sustainability but also in the broader effectiveness of monetary policy in stabilizing the economy (Menicucci and Paolucci, 2016).

Uddin (2022) conducted a study to examine how leverage, operating efficiency, non-performing loans (NPLs), and the capital adequacy ratio (CAR) affect the profitability of commercial banks in Bangladesh. The study revealed the effect of non-performing loans (NPLs) on ROA was found to be negative and insignificant. Similarly, cost efficiency ratios, which measure how effectively a bank manages its expenses relative to its income, play a pivotal role in its performance. Banks with high cost efficiency can maximize their profitability by controlling operating costs while maintaining strong revenue generation. Efficient management of expenses, including labor and operational costs, contributes to higher return on assets (ROA) and return on equity (ROE), enhancing overall financial performance. In a similar study by Chimkono *et al.* (2016), the effects of non-performing loans (NPL), cost efficiency ratios, and average lending interest rates on the financial performance of commercial banks in Malawi were investigated. The findings revealed that the NPL ratio, cost efficiency ratios, and lending interest rates all had a significant effect on the performance of Malawian banks. The study also found that the cash reserve ratio (CRR) was positively related to bank performance, but this relationship was not statistically significant. The study reveals that key factors such as the non-performing loan (NPL) ratio, cost efficiency ratios, and lending interest rates significantly impact bank performance. A high NPL ratio, indicating that a larger proportion of loans are defaulted or not being repaid, negatively affects a bank's profitability and overall performance. It increases the cost of loan provisioning, reduces the available capital for further lending, and can signal poor credit risk management, all of which can diminish investor confidence and the bank's long-term sustainability. Lending interest rates also significantly affect bank performance, as they determine the revenue generated from loans. Setting appropriate lending rates that align with market conditions, regulatory requirements, and risk factors is crucial. High lending rates can lead to higher income from loans, but they may also discourage borrowers, reduce loan demand, or increase the risk of defaults. Conversely, low rates can attract more borrowers but may not generate sufficient returns to cover costs or contribute to profitability (Siddique *et al.*, 2022).

Mia *et al.* (2023) found a negative relationship between CRR and profitability in Bangladesh. Conversely, the negative impact of non-performing loans underscores the detrimental effect of poor credit quality on bank profitability. High NPLs reduce interest income, increase loan provisioning costs, and signal inefficiencies in credit risk management, all of which erode bank profitability. The loan-to-deposit ratio, when excessively high, can negatively impact ROA, as it may indicate aggressive lending practices without sufficient deposits to maintain liquidity, potentially increasing default risks. Similarly, higher loan loss provisions, which are funds set aside to cover potential loan defaults, negatively affect ROA by reducing the net income available to shareholders. Olagunju *et al.* (2021) observed a long-term negative impact of CRR on profitability in Nigeria. Uremadu (2012) identified a positive relationship between CRR and profitability in Nigeria, emphasizing the importance of liquidity management. Jui *et al.* (2020) found that interest rate spreads positively influenced profitability in Bangladeshi banks, while Khan (2014) observed similar trends in Pakistan, with private banks being more sensitive to rate changes. Nath *et al.* (2024) indicated that while higher SLR may reduce profitability, efficient liquidity management boosts it in Bangladesh. In Bangladesh, the relationship between statutory liquidity ratio (SLR) and bank profitability reflects a delicate balance. While a higher SLR, which mandates banks to hold a certain percentage of their deposits in liquid assets like government bonds, can reduce profitability

by tying up capital that could otherwise be used for lending or higher-yield investments, it also ensures financial stability by providing a safety cushion against liquidity crises. This regulatory requirement, while limiting short-term profitability, helps mitigate risks during economic or market downturns. On the other hand, efficient liquidity management is a crucial factor that can enhance profitability. Banks that effectively manage their liquidity, ensuring they have enough cash or easily sellable assets to meet their obligations without holding excessive reserves, can optimize their balance sheets and improve returns. By carefully managing liquidity to maintain adequate SLR levels without excessively impacting their lending and investment capabilities, banks in Bangladesh can strike a balance between regulatory compliance and maximizing profitability. Banks that implement sophisticated liquidity management strategies, such as optimizing cash flow forecasting, diversifying asset portfolios, and leveraging short-term funding options, can ensure stable growth and enhanced financial performance while maintaining regulatory adherence. Thus, while a high SLR may limit profitability, the ability to manage liquidity efficiently can counteract this limitation and drive improved financial outcomes. Maigua and Mouni (2016) linked inflation, discount, and exchange rates to higher bank performance in Kenya, whereas Were and Wambua (2014) emphasized bank-specific factors like size and credit risk on interest rate spreads. Maccarthy (2016) identified a positive relationship between the cash reserve ratio (CRR) and the financial performance of commercial banks, as measured by return on investment, indicating that higher CRR can enhance profitability. Similarly, Oganda et al. (2018) found that the cash reserve ratio positively affects the profitability of commercial banks in Kenya. Their study highlighted that adjustments to the CRR, along with changes in the discount rate and open market operations, play a significant role in influencing banks' ability to extend credit, thereby impacting their overall financial performance.

In Nepal, Shrestha and Khadka (2024) found a negative relationship between nonperforming loans (NPLs) and profitability, suggesting that reducing NPLs can improve bank performance. A positive relationship between interest rate spread and profitability suggests that banks benefit from a wider gap between lending rates and deposit rates, as it directly increases their net interest income. This spread allows banks to cover operational costs, absorb risks, and generate profits, thereby enhancing their financial performance (Bhattarai, 2018). Given its significance, it is advisable for banks to optimize their interest rate strategies by carefully adjusting lending and deposit rates in response to market conditions and central bank policies. However, banks must also consider competitive factors, regulatory constraints, and the potential impact on customer behavior when setting their rates. By striking the right balance between attracting depositors and borrowers, banks can maximize their profitability while maintaining stability and compliance with financial regulations (Singh et al., 2021).

The above discussion shows that empirical evidences vary greatly across the studies on the effect of credit risk, interest rates and monetary policy on the financial performance are of greater significance. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the effect of credit risk, interest rates and monetary policy on the financial performance of Nepalese commercial banks. More specifically, the study analyze the relationship of non-performing loans, loan loss provisions, interest rate spread, loan-to-deposit ratio, cash reserve ratio, and statutory liquidity ratio with the profitability (ROA and ROE) of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 12 Nepalese commercial banks from 2014/15 to 2022/23, leading to a total of 108 observations. The study employed stratified sampling method. Strata was formed on the basis of ownership structure. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	Observation
1	Prime Commercial Bank Limited	2014/15-2022/23	9
2	Siddhartha Bank Limited	2014/15-2022/23	9
3	Nepal SBI Bank Limited	2014/15-2022/23	9
4	Agricultural Development Bank Limited	2014/15-2022/23	9
5	Everest Bank Limited	2014/15-2022/23	9
6	Nepal Bank Limited	2014/15-2022/23	9
7	Standard Chartered Bank Nepal Limited	2014/15-2022/23	9
8	Himalayan Bank Limited	2014/15-2022/23	9
9	Citizens Bank International Limited	2014/15-2022/23	9
10	NMB Bank Limited	2014/15-2022/23	9
11	Machhapuchchhre Bank Limited	2014/15-2022/23	9
12	Sanima Bank Limited	2014/15-2022/23	9
Total number of observations			108

Thus, the study is based on the 108 observations.

The model

The model used in this study assumes that financial performance depends upon credit risk, interest rates and monetary policy. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are non-performing loan to total loan, loan loss provision to total loan, interest rate spread, loan to deposit ratio, cash reserve ratio and statutory liquidity ratio. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 NPL + \beta_2 LLP + \beta_3 IRS + \beta_4 LDR + \beta_5 CRR + \beta_6 SLR + e_{it}$$

$$ROE = \beta_0 + \beta_1 NPL + \beta_2 LLP + \beta_3 IRS + \beta_4 LDR + \beta_5 CRR + \beta_6 SLR + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

NPL = Non-performing loans as measured by the ratio of non-performing loans to total loans, in

percentage.

LLP = Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage.

IRS = Interest rate spread as measured by difference between interest rate charged by banks on loans and interest rate paid by commercial banks for deposits, in percentage.

LDR = Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

CRR = Cash reserve ratio as measured by the ratio of their total deposits that must be kept as reserves with the Nepal Rastra Bank, in percentage.

SLR = Statutory liquidity ratio as measured by the percentage of a bank's net demand and time liabilities, in percentage.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Non-performing loan

Non-performing loan is measured as the percentage of non-performing loans to total loans. Similarly, non-performing loan is a loan where the borrower has stopped paying the installments on the principal (original amount) and interest (Singh *et al.*, 2021). Kwashie (2022) showed that the non-performing loans have a negative impact on the measures of financial performance. Likewise, Akter and Roy (2017) found that NPL has a negative and significant effect on ROA. Similarly, Roy and Jouini (2013) showed that nonperforming loans have negative and significant association with return on assets. Kingu *et al.* (2018) highlights the connection between macroeconomic factors and the NPL ratio, noting that economic downturns can cause a spike in non-performing loans. This increase puts pressure on banks' profitability, as higher NPLs lead to reduced interest income and increased provisioning costs. The study emphasized that maintaining a low NPL ratio is key to ensuring stable bank profitability, particularly during economic instability. Based on it, this study develops the following hypothesis:

H₁: There is a negative relationship between non-performing loan and profitability of banks.

Loan loss provision to total loan

Loan loss provision measures the proportion of total loans that a bank sets aside as provisions to cover potential loan losses. It directly impacts both the bank's profitability and its ability to manage credit risk. A higher LLP ratio signals greater loan defaults, reducing profitability due to increased provisions (Gurung *et al.*, 2023). Uremadu (2012) found that loan loss provisions negatively affected the profitability of commercial banks in Nigeria. Islam *et al.* (2018) found that loan loss provisions (LLPs) negatively affected the profitability of commercial banks, with higher LLP levels leading to a decline in profitability. Teshome *et al.* (2018) found that non-performing loans (NPLs) and loan loss provisions negatively affected the financial performance of private commercial banks in Ethiopia, measured by Return on Assets (ROA) and Return on Equity (ROE). Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between loan loss provision to total loan and profitability of banks.

Interest rate spread

The interest rate spread is the difference between the interest rate a bank charges on loans and

the rate it pays on deposits which directly impacts bank profitability. Uremadu (2012) explored how interest rate spread influences profitability in emerging markets. The study found that banks with higher interest rate spreads generally experience improved profitability, but competitive pressures and regulatory constraints can reduce the impact of this spread. Jui *et al.* (2020) found that changes in interest rates significantly affect the profitability of commercial banks in Bangladesh, with a positive relationship between the interest rate spread and key profitability metrics such as Return on Equity (ROE), Return on Assets (ROA), and Net Interest Margin (NIM). Khan (2014) found a strong positive correlation between interest rate changes and the profitability of commercial banks in Pakistan, with an increase in the interest rate leading to higher bank profitability. Based on it, this study develops the following hypothesis:

H3: There is a positive relationship between interest rate spread and profitability of banks.

Loan to deposit ratio

Loan to deposit ratio (LDR) is a key financial metric used to assess the liquidity and profitability of banks. Elbadry (2018) found that a moderate increase in LDR is positively correlated with profitability, particularly in markets with stable deposit growth. Bandara *et al.* (2021) found that there is a statistically significant and positive relationship between loans to deposits ratio and bank profitability. Sihotang *et al.* (2022) found a positive and significant relationship between the loan-to-deposit ratio (LDR) and profitability (measured by Return on Assets, ROA) in Islamic commercial banks in Indonesia, indicating that a higher LDR contributes to improved profitability for these banks. Nugroho *et al.* (2021) found that there is a positive and significant relationship between the credit-to-deposit ratio and return on assets (ROA). The study showed that credit to deposit ratio is positively related to return on assets and return on equity. Based on it, this study develops the following hypothesis.

H₄: There is a positive relationship between loan-to-deposit ratio and profitability of banks.

Cash reserve ratio

CRR is the minimum proportion of all customer deposits that commercial banks must hold as reserves with the central bank. By changing the CRR, the central bank may control the amount of liquidity. Olagunju and Isiaka (2021) found a significant relationship between the cash reserve ratio (CRR) and bank profitability, as measured by return on assets and return on equity, indicating that increases in CRR adversely affect profitability by influencing banks' intermediary operations. Maccarthy (2016) found a positive relationship between the cash reserve ratio (CRR) and the financial performance of commercial banks, as indicated by return on investment, suggesting that higher CRR improves profitability. Oganda *et al.* (2018) found that the cash reserve ratio positively influences the profitability of commercial banks in Kenya, as adjustments to this rate, along with changes in the discount rate and open market operations, significantly impact the banks' ability to extend credit and, in turn, their financial performance. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between cash reserve ratio and profitability of banks.

Statutory liquidity ratio

Statutory Liquidity Ratio (SLR) is a minimum percentage of a bank's total deposits that must be kept in the form of liquid assets such as cash, gold, or government securities. Mashamba (2018) found that the Statutory Liquidity Ratio (SLR) has a positive correlation with the profitability of public sector banks, as increases in SLR enhance Return on Assets (ROA) and Return on Equity (ROE). Uremadu (2012) found that both Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR) have a positive relationship with bank profitability in Nigeria, indicating that higher levels of these reserves

positively impact banking profits. Alali (2019) found that Statutory Liquidity Ratio (SLR) significantly affects bank profitability in Uganda Based on it, this study develops the following hypothesis:

H_6 : There is a positive relationship between statutory liquidity ratio and profitability of banks.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2014/15 to 2022/23.

Table 2

Descriptive statistics

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 12 Nepalese commercial banks for the study period of 2014/15 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are LLP (Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), IRS (Interest rate spread as measured by difference between interest rate charged by banks on loans and interest rate paid by commercial banks for deposits, in percentage), CRR (Cash reserve ratio as measured by the ratio of their total deposits that must be kept as reserves with the Nepal Rastra Bank, in percentage) and SLR (Statutory liquidity ratio as measured by the percentage of a bank's net demand and time liabilities, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.56	1.59	0.53
ROE	1.82	91.51	16.56	10.97
NPL	0.01	4.93	1.33	1.17
LLP	13.36	858.52	210.74	163.07
IRS	0.03	7.15	4.15	0.86
LDR	0.09	7.98	1.12	1.22
CRR	0.06	36.21	15.12	9.70
SLR	10.00	12.00	11.11	0.99

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 12 Nepalese commercial banks for the study period of 2014/15 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are LLP (Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), IRS (Interest rate spread as measured by difference between interest rate charged by banks on loans and interest rate paid by commercial banks for deposits, in percentage), CRR (Cash reserve ratio as measured by the ratio of their total deposits that must be kept as reserves with the Nepal Rastra Bank, in percentage) and SLR (Statutory liquidity ratio as measured by the percentage

of a bank's net demand and time liabilities, in percentage).

Variables	ROA	ROE	NPL	LLP	IRS	LDR	CRR	SLR
ROA	1							
ROE	0.634**	1						
NPL	-0.039	0.216*	1					
LLP	-0.376**	0.024	0.701**	1				
IRS	0.372**	0.496**	0.257**	0.095	1			
LDR	-0.033	0.029	-0.176	-0.012	-0.040	1		
CRR	0.128	0.317**	0.198*	0.102	0.316**	0.269**	1	
SLR	0.236*	0.191*	0.180	-0.085	0.314	-0.092	-0.058	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that loan loss provision to total loan has a negative relationship with return on assets. It indicates that increase in loan loss provision to total loan leads to decrease in return on assets. In addition, there is a negative relationship between non-performing loan and return on assets. It indicates that increase in non-performing loan leads to decrease in return on assets. However, there is a positive relationship between interest rate spread and return on assets. It indicates that increase in interest rate spread lead to increase in return on assets. Likewise, statutory liquidity ratio has a positive relationship with return on assets. It indicates that higher the statutory liquidity ratio, higher would be the return on assets. In addition, cash reserve ratio has a positive relationship with return on assets. It indicates that higher the cash reserve ratio, higher would be the return on assets. However, loan to deposit ratio has a negative relationship with return on assets. It indicates that higher the loan to deposit ratio, lower would be the return on assets.

Similarly, the result also shows that loan loss provision to total loan has a positive relationship with return on equity. It indicates that increase in loan loss provision to total loan leads to increase in return on equity. In addition, there is a positive relationship between non-performing loan and return on equity. It indicates that increase in non-performing loan leads to increase in return on equity. However, there is a positive relationship between interest rate spread and return on equity. It indicates that increase in interest rate spread lead to increase in return on equity. Likewise, statutory liquidity ratio has a positive relationship with return on equity. It indicates that higher the statutory liquidity ratio, higher would be the return on equity. In addition, cash reserve ratio has a positive relationship with return on equity. It indicates that higher the cash reserve ratio, higher would be the return on equity. However, loan to deposit ratio has a positive relationship with return on equity. It indicates that higher the loan to deposit ratio, higher would be the return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of non-performing loan to total loan, loan loss provision to total loan, interest rate spread, loan to deposit ratio, cash reserve ratio and statutory liquidity ratio with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of non-performing loan to total loan, loan loss provision to total loan, interest rate spread, loan to deposit ratio, cash reserve ratio and statutory liquidity ratio on return on assets

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 NPL + \beta_2 LLP + \beta_3 IRS + \beta_4 LDR + \beta_5 CRR + \beta_6 SLR + e_{it}$ where the dependent variable is ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage). The independent variables are LLP (Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), IRS (Interest rate spread as measured by difference between interest rate charged by banks on loans and interest rate paid by commercial banks for deposits, in percentage), CRR (Cash reserve ratio as measured by the ratio of their total deposits that must be kept as reserves with the Nepal Rastra Bank, in percentage) and SLR (Statutory liquidity ratio as measured by the percentage of a bank's net demand and time liabilities, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		NPL	LLP	IRS	LDR	CRR	SLR			
1	1.617 (20.649)*	-0.018 (0.406)**						0.008	0.535	0.164
2	1.852 (23.644)**		-0.001 (4.173)					0.133	0.496	17.411
3	0.635 (2.667)			0.230 (4.128)				0.130	0.497	17.036
4	1.609 (22.927)				0.014 (0.342)			0.008	0.535	0.117
5	1.486 (15.652)					0.007 (1.328)		0.007	0.531	1.764
6	1.190 (0.338)						1.126 (2.504)	0.047	0.520	6.272
7	1.797 (23.806)	-0.200 (3.695)	-0.002 (5.739)					0.225	0.469	16.573
8	0.652 (2.692)	-0.069 (1.613)		0.254 (4.403)	0.019 (0.478)			1.136	0.495	6.595
9	0.362 (0.668)	-0.123 (2.108)	-0.002 (4.947)	0.210 (3.899)	0.010 (0.258)	0.002 (0.302)	0.051 (1.119)	0.325	0.438	9.589

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Return on assets is the dependent variable.

Table 4 shows that beta coefficients for non-performing loans are negative with return on assets. It indicates that non-performing loans has a negative impact on return on assets. This finding is similar to the findings of Akter and Roy (2017). Similarly, the beta coefficients for loan loss provision are negative with return on assets. It indicates that loan loss provision has a negative impact on return on assets. The findings is consistent with the findings of Uremadu (2012). Likewise, the beta coefficients for interest rate spread are positive with return on assets. It indicates that interest rate spread has a positive impact on return on assets. This finding is consistent with the findings of Jui *et al.* (2020). Further, the beta coefficients for loan-to-deposit ratio are negative with return on assets. It indicates that loan-to-deposit ratio has a negative impact on return on assets. This finding is not similar with the findings of Nugroho *et al.* (2021). Moreover, the beta coefficients for cash reserve ratio are positive with return on assets. It indicates that cash reserve ratio has a positive impact on return on assets. This finding is similar to the findings of Oganda *et al.* (2018). Furthermore, the beta coefficients for statutory liquidity are positive with return on assets. It indicates that statutory liquidity ratio has a positive impact on return on assets. The findings is consistent with the findings of Alali (2019).

Table 5 shows the regression results of non-performing loan to total loan, loan loss provision to total loan, interest rate spread, loan to deposit ratio, cash reserve ratio and statutory liquidity ratio with return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of non-performing loan to total loan, loan loss provision to total loan, interest

rate spread, loan to deposit ratio, cash reserve ratio and statutory liquidity ratio on return on equity

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15 to 2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 NPL + \beta_2 LLP + \beta_3 IRS + \beta_4 LDR + \beta_5 CRR + \beta_6 SLR + e_{it}$ where the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are LLP (Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), IRS (Interest rate spread as measured by difference between interest rate charged by banks on loans and interest rate paid by commercial banks for deposits, in percentage), CRR (Cash reserve ratio as measured by the ratio of their total deposits that must be kept as reserves with the Nepal Rastra Bank, in percentage) and SLR (Statutory liquidity ratio as measured by the percentage of a bank's net demand and time liabilities, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		NPL	LLP	IRS	LDR	CRR	SLR			
1	13.865 (8.810)	2.020 (2.281)						0.038	10.76	5.201
2	16.234 (9.342)		0.002 (0.242)					0.009	11.02	0.059
3	-9.714 (-2.130)			6.318 (5.883)				0.239	9.57	34.61
4	16.279 (11.27)				0.256 (0.294)			0.009	11.02	0.087
5	11.144 (5.965)					0.359 (3.446)		0.092	10.45	11.87
6	-6.796 (-0.582)						2.103 (2.007)	0.028	10.82	4.029
7	15.231 (8.911)	3.674 (2.993)	0.017 (1.920)					0.062	10.63	4.51
8	-10.404 (-2.22)	0.998 (1.204)		6.002 (5.396)	0.594 (0.772)			0.237	9.58	12.11
9	-21.468 (-1.845)	1.506 (1.207)	0.009 (1.084)	5.102 (4.423)	0.323 (0.398)	0.191 (1.793)	1.221 (1.232)	0.265	9.405	7.433

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on equity is the dependent variable.

Table 5 shows that beta coefficients for non-performing loans are positive with return on equity. It indicates that non-performing loans has a positive impact on return on equity. This finding is similar to the findings of Kwashie (2022). Similarly, the beta coefficients for loan loss provision are positive with return on equity. It indicates that loan loss provision has a positive impact on return on equity. The findings is consistent with the findings of Islam *et al.* (2018). Likewise, the beta coefficients for interest rate spread are positive with return on equity. It indicates that interest rate spread has a positive impact on return on equity. This finding is consistent with the findings of Khan (2014). Further, the beta coefficients for loan-to-deposit ratio are positive with return on equity. It indicates that loan-to-deposit ratio has a positive impact on return on equity. This finding is not similar with the findings of Elbadry (2018). Moreover, the beta coefficients for cash reserve ratio are positive with return on equity. It indicates that cash reserve ratio has a positive impact on return on equity. This finding is similar to the findings of Maccarthy (2016). Furthermore, the beta coefficients for statutory liquidity are positive with return on equity. It indicates that statutory liquidity ratio has a positive impact on return on equity. The findings is consistent with the findings of Mashamba (2018).

4. Summary and conclusion

Commercial banks play a critical role in the financial system by facilitating economic activity through services like deposits, loans, and financial products. Their profitability is crucial for maintaining

financial stability, contributing to economic growth, and managing risks. Various factors, both macro (external) and micro (internal), influence bank profitability, including credit risk management, interest rates, and monetary policy. Sound performance of commercial banks is what a country needs for healthy economic growth. Globally, the banking sector has undergone significant transformations for the past decades with banks activities and performance being influenced by both internal and external factors. Banks generally contribute to economic growth through their intermediation functions and the financing of economic activities. The high level of profitability describes the good performance of a company, which means that the bank has been operating effectively and efficiently

This study attempts to analyze the effect of credit risk, interest rates and monetary policy on the financial performance of Nepalese commercial banks. The study is based on secondary data of 12 commercial banks with 108 observations for the period from 2014/15 to 2022/23.

The major conclusion of this study is that interest rate spread, cash reserve ratio and statutory liquidity ratio have positive effect on return on assets of Nepalese commercial banks. However, non-performing loans, loan-to-deposit ratio and loan loss provision negatively affects return on assets. In contrast, non-performing loans, loan loss provision, interest rate spread, loan-to-deposit ratio, cash reserve ratio, and statutory liquidity all have positive effect on return on equity. The study also concluded that a wider interest rate spread, reflecting the gap between lending and deposit rates, contributes positively to bank profitability by increasing net interest income, which is a critical source of revenue for banks. Similarly, the cash reserve ratio and statutory liquidity ratio, despite their regulatory nature, positively influence ROA as they ensure liquidity stability and provide opportunities for income generation.

References

- Akter, R., and J. K. Roy, 2017. The impacts of non-performing loan on profitability: An empirical study on banking sector of Dhaka stock exchange. *International Journal of Economics and Finance*, 9(3), 126-132.
- Alali, S. M., 2019. The impact of bank liquidity on the profitability of commercial banks: An applied study on Jordanian commercial banks for the period (2013/2017). *International Journal of Economics and Financial Issues* 9(5), 24-28.
- Albertazzi, U., and L. Gambacorta, 2009. Bank profitability and the business cycle. *Journal of Financial Stability* 5(4), 393-409.
- Ani, W. U., D. O. Ugwunta, I. J. Ezeudu, and G. O. Ugwuanyi, 2012. An empirical assessment of the determinants of bank profitability in Nigeria: Bank characteristics panel evidence. *Journal of Accounting and Taxation* 4(3), 38-43.
- Bandara, H. M. K. S., A. L. Jameel, and H. Athambawa, 2021. Credit risk and profitability of banking sector in Sri Lanka. *Journal of Economics, Finance and Accounting Studies* 3(1), 65-71.
- Bhattacharai, B. P. 2018. Assessing banks internal and macroeconomic factors as determinants of non-performing loans: Evidence from Nepalese commercial banks. *International Journal of Accounting and Finance Review* 3(1), 13-32.
- Chimkono, E. E., W. Muturi, and A. Njeru, 2016. Effect of non-performing loans and other factors on performance of commercial banks in Malawi. *International Journal of Economics, Commerce and Management* 4(2), 549-563.
- Elbadry, A., 2018. Bank's financial stability and risk management. *Journal of Islamic Accounting and Business Research* 9(2), 119-137.

- Gurung, R., B. Ghimire, and P. Dahal, 2023. Exploring the impact of loan loss provision on profitability: An analysis of commercial banks in Nepal. *The Journal of Business and Management* 8(2), 61-75.
- Islam, F. T., 2018. Evaluating loan loss provisioning for non-performing loans and its impact on the profitability of commercial banks in Bangladesh. *Asian Finance and Banking Review* 2(2), 33-41.
- Jui, S. N., R. H. Sakib, and M. A. Rafsan, 2020. Association between interest rate changes and profitability of commercial banks of Bangladesh. *International Journal of Science and Business* 4(9), 17-37.
- Khan, W. A., 2014. Impact of interest rate changes on the profitability of four major commercial banks in Pakistan. *International Journal of Accounting and Financial Reporting*, 4(1), 142-154.
- Kingu, P. S., S. Macha, and R. Gwahula, 2018. Impact of non-performing loans on bank's profitability: Empirical evidence from commercial banks in Tanzania. *International Journal of Scientific Research and Management* 6(1), 71-79.
- Maccarthy, J., 2016. The effect of Cash Reserve Ratio (CRR) on the financial performance of commercial banks and their engagement in CRS in Ghana. *Journal of Finance* 4(1), 1-12.
- Maigua, C., and G. Mouni, 2016. Influence of interest rates determinants on the performance of commercial banks in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 6(2), 121-133.
- Mashamba, T., 2018. The effects of Basel III liquidity regulations on banks' profitability. *Journal of Governance and Regulation* 7(2), 34-48.
- Menicucci, E., and G. Paolucci, 2016. The determinants of bank profitability: empirical evidence from European banking sector. *Journal of Financial Reporting and Accounting* 14(1), 86-115.
- Messai, A. S., and F. Jouini, 2013. Micro and macro determinants of non-performing loans. *International Journal of Economics and Financial Issues* 3(4), 852-860.
- Mia, M. F., M. A. Nodi, A. Mia, and S. Alam, 2023. Impact of cash reserve ratio on banks profitability: A study on conventional commercial banks in Bangladesh. *Journal of Asian Business Strategy* 13(1), 24-32.
- Nath, S. D., M. R. Biswas, M. A. Maleque, and M. M. Islam, 2024. Effect of Basel III Liquidity Ratio LCR and NSFR on the Profitability of Commercial Banks in Bangladesh. *International Journal of Economics and Business Administration* 12(3), 12-28.
- Nugroho, L., A. Badawi, E. Nugraha, and Y. M. Putra, 2021. What determines Islamic performance ratio of islamic banking in indonesia? An analysis using financing to deposit ratio as moderator. *Share: Jurnal Ekonomi dan Keuangan Islam* 10(1), 104-123.
- Oganda, A. J., V. A. Mogwambo, and S. Otieno, 2018. Effect of cash reserves on performance of commercial banks in Kenya: A comparative study between national bank and equity bank Kenya limited. *International Journal of Academic Research in Business and Social Sciences* 8(9), 685-704.
- Olagunju, I. L., and N. A. Isiaka, (2021). The economic implication of cash reserve requirement on the profitability of deposit money banks in Nigeria. *Cross-Cultural Communication*, 17(1), 38-47.
- Olagunju, I. L., and N. A. Isiaka, 2021. The economic implication of cash reserve requirement on the profitability of deposit money banks in Nigeria. *Cross-Cultural Communication* 17(1), 38-47.
- Shrestha, P. M., and K. K. Khadka, 2024. Impact of non-performing loan on profitability of Nepalese commercial banks. *Researcher CAB: A Journal for Research and Development* 3(1), 62-75.
- Siddique, A., M. A. Khan, and Z. Khan, 2022. The effect of credit risk management and bank-specific factors on the financial performance of the South Asian commercial banks. *Asian Journal of Accounting*

Research 7(2), 182-194.

- Sihotang, M. K., U. Hasanah, and I. Hayati, 2022. Model of Sharia bank financial performance determination factors by measuring internal and external variables. *Indonesian Interdisciplinary Journal of Sharia Economics* 5(1), 235-251.
- Simatele, M., S. Mishi, and N. Ngonyama, 2018. Structure and profitability in the banking sector. *Banks and Bank Systems* 13(1), 49-59.
- Singh, S. K., B. Basuki, and R. Setiawan, 2021. The effect of non-performing loan on profitability: Empirical evidence from Nepalese commercial banks. *The Journal of Asian Finance, Economics and Business* 8(4), 709-716.
- Singh, S. K., B. Basuki, and R. Setiawan, 2021. The effect of non-performing loan on profitability: Empirical evidence from Nepalese commercial banks. *The Journal of Asian Finance, Economics and Business* 8(4), 709-716.
- Teshome, E., K. Debela, and M. Sultan, 2018. Determinants of financial performance of commercial banks in Ethiopia: Special emphasis on private commercial banks. *African Journal of Business Management* 12(1), 1-10.
- Uddin, M. K., 2022. Effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. *European Journal of Business and Management Research* 7(3), 289-295.
- Were, M., and J. Wambua, 2014. What factors drive interest rate spread of commercial banks? Empirical evidence from Kenya. *Review of Development Finance* 4(2), 73-82.

Chapter 21

Effects of interest rate, inflation, and bank specific risk factors on the performance of Nepalese commercial banks

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Abstract

This study examines the effects of interest rate, inflation, and bank specific risk factors on the performance of Nepalese commercial banks. Return on asset and return on equity are selected as the dependent variables. The selected independent variables are interest rate spread, inflation, credit risk, capital adequacy ratio, liquidity risk, and operational risk. The study is based on secondary data of 13 commercial banks with 117 observations for the study period from 2014/15 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB), annual reports of the selected commercial banks, World Bank and OECD Inflation CPI indicator. The correlation coefficients and regression models are estimated to test the significance and importance of interest rate, inflation, and bank specific risk factors on the performance of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive impact on return on assets and return on equity. It indicates that higher the capital adequacy ratio, higher would be the return on assets and return on equity. Similarly, interest rate spread has a positive impact on return on assets and return on equity. It indicates that higher the interest rate spread, higher would be the return on assets and return on equity. However, non-performing loans has a negative impact on return on assets and return on equity. It indicates that higher the non-performing loan, lower would be the return on assets and return on equity. Similarly, credit risk has a negative impact on return on assets and return on equity. It indicates that higher the credit risk, lower would be the return on assets and return on equity. Likewise, operational risk has a negative impact on return on assets and return on equity. It indicates that increase in operational risk leads to decrease in return on assets and return on equity. Further, inflation has a negative impact on return on assets and return on equity. It indicates that higher inflation, lower would be the return on assets and return on equity.

Keywords: return on asset, return on equity, interest rate spread, inflation, credit risk, capital adequacy ratio, liquidity risk, operational risk

1. Introduction

A bank is a financial institution that provides various services related to money management, including accepting deposits, providing loans, and offering investment products. Banks play a crucial role in the economy by facilitating financial transactions, offering credit, and ensuring the flow of money. Banks also offer a range of additional services like wealth management, foreign exchange, and safe deposit boxes. Athanasoglou *et al.* (2006) stated that the banking sector acts as the life blood of modern trade and commerce to provide them with a major source of finance. This increasing phenomenon of globalization has made the concept of efficiency more important both for the non-financial and financial institutions and banks are the part of them. Similarly, Ahmad and Ahmad (2017) argued that capital adequacy is one of the vital indicators of the financial solvency of the banking industry. Capital adequacy is considered as a safety valve to protect the depositors to promote stability and efficiency in the whole financial system of a country. The operational activities of the banking industry generate operational costs, generate operational income and involve assets in the process (Adam *et al.*, 2018).

Saleh and Abu (2020) investigated the effect of credit risk, liquidity risk and bank capital on bank profitability over a nine-year period (2010-2018) by examining empirical evidence from an emerging market. The study found that credit risk, liquidity risk, and bank capital have negative impact on banks' profitability. Similarly, Maigua *et al.* (2016) assessed the influence of interest rates

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on the performance of commercial banks. The study found that there is a negative relationship between interest spread rate and profitability of commercial banks. Likewise, Sunaryo (2020) analyzed the effect of capital adequacy ratio, net interest margin, non-performing loan, and loan to deposit ratio on return on asset. The study revealed that capital adequacy ratio and net interest margin have positive and significant impact on return on asset. Further, Tassew (2019) investigated the effect of risk management on financial performance of commercial banks in Ethiopia. The study found that credit risk, liquidity risk, operating risk and market risks have significant but negative impact on financial performance of commercial banks in Ethiopia. Patwary and Tasneem (2019) examined the impact of non-performing loan on profitability of banks in Bangladesh. The study revealed that there is a negative relationship between non-performing loan and banks' profitability measured by return on assets. Similarly, Angsoyiri (2021) analyzed the impact of non-performing loans on bank profitability: An empirical evidence from commercial banks in Ghana. The study showed that non-performing loan has a negative impact on profitability of banks. However, operating efficiency has a positive and statistically significant relationship with profitability as proxies by return on equity. Likewise, Akter and Roy (2017) investigated the impacts of non-performing loan on profitability empirical study on banking sector of Dhaka stock exchange. The study concluded that net profit margin has a positive and significant impact on profitability of banks measured by return on assets.

Hadian (2021) examined the effect of non-performing loans and loan to deposit ratio on return on assets in the banking industry. The study revealed that non-performing loan has a negative impact on return on assets. Similarly, loan to deposit ratio has a positive and significant impact on return on assets. Similarly, Lawati (2021) examined the effect of loan to deposit ratio and debt to equity ratio on return on equity. The results showed that loan to deposit ratio has a positive and significant impact on return on equity. In addition, Brastama and Yadnya (2020) analyzed the effect of capital adequacy ratio and non-performing loan on banking stock prices with performance as intervening variable. The results stated that capital adequacy ratio has a positive impact on return on assets. Similarly, the non-performing loan has a negative impact on return on assets. Moreover, Sukmadewi (2020) examined the effect of capital adequacy ratio, loan to deposit ratio, operating-income ratio, non-performing loans, and net interest margin on banking financial performance. The results revealed that capital adequacy ratio, non-performing loan, and loan to deposit ratio have positive and significant impact on return on assets. Similarly, Solihati (2020) analyzed the factors affecting banking performance. The results revealed that non-performing loan and capital adequacy ratio have significant impact on return on assets (ROA). Meanwhile, non-performing loan has a significant and negative impact on return on assets (ROA) and capital adequacy ratio is not significantly affected by return on assets (ROA). Moreover, Utu (2019) examined non-performing loan, net interest margin, and loan to deposit ratio as well as their effects on return on asset in bank Sultra. The results revealed that non-performing loan (NPL) and loan to deposit ratio (LDR) have positive and significant impact on return on assets (ROA).

Dao (2020) investigated bank capital adequacy ratio and bank performance in Vietnam. The study concluded that capital adequacy ratio has a statistically significant relationship with bank performance. Likewise, the results stated that expenses ratio and the non-performing loan play crucial role in explaining the performance of rural banks in Indonesia. The study also indicated that efficiency and prudence in management policies for banking industry in Indonesia becomes more important. Similarly, Chou and Buchdadi (2016) examined the bank performance and its underlying factors in rural banks in Indonesia. The study stated that expenses ratio and non-performing loan play crucial role in explaining the performance of bank. Moreover, Samad (2015) explored the determinants of financial performance of Bangladesh's commercial banks. The study empirically concluded that bank specific factors such as loan to deposit ratio, loan loss provision to total assets, equity capital to total assets, and operating expenses to total assets are significant factors. The study also concluded that bank size and

macroeconomic variables have no impacts on bank profit. Likewise, Rahman *et al.* (2015) examined the determinants of financial performance of Bangladesh's banks. The results found that bank size has a positive and significant impact on return on assets (ROA) and inflation has a negative and significant impact on return on assets (ROA) and return on equity (ROE).

Francis (2007) found that capital adequacy and credit risk have positive effect on bank profitability. Similarly, Zribi and Younes (2011) revealed that credit risk in emerging economy than that in developed economies and that risk is formed by a larger number of bank-specific factors in emerging economies compared to their counterparts in developed economies. Likewise, Ruziqa (2013) examined the impact of credit risk and liquidity risk on the financial performance of conventional banks. The results illustrated that credit risk is negatively related to profitability while liquidity risk demonstrated a positive effect. Further, Al-Tamimi and Obeidat (2013) found most important variable which affect the capital adequacy of commercial banks of Jordan in Amman Stock Exchange. The study revealed that there is a statistically significant positive correlation between the degree of capital adequacy in commercial banks and the factors of liquidity risk and there is an inverse relationship between the degree of capital adequacy in commercial banks and factors of the capital risk and credit risk.

In the context of Nepal, Pradhan and Parajuli (2017) investigated the effect of capital adequacy and cost income ratio on the performance of Nepalese commercial banks. The study found that there is a positive relationship of capital adequacy and cost income ratio with return on assets. Similarly, Chalise (2019) examined the impact of capital adequacy ratio and cost income ratio on the performance of Nepalese commercial banks. The study revealed that capital adequacy ratio has a negative and an insignificant impact on banks' performance measured by return on assets. Likewise, Poudel (2018) assessed the credit risk in Nepali commercial banks. The study revealed that liquidity has a significant and positive impact on credit risk. Further, Adhikari (2021) examined the efficiency, profitability and stability of the Nepalese commercial banks. The study revealed a positive and significant impact of bank efficiency on banks' stability. In addition, Chhetri (2023) revealed that capital adequacy ratio has a positive and statistically significant impact on return on equity whereas investment ratio has a negative and statistically significant impact on return on equity.

The above discussion shows that empirical evidences vary greatly across the studies on the effects of interest rate, inflation, and bank specific risk factors on the performance of commercial banks. Though there is above-mentioned empirical evidence in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the effects of interest rate, inflation, and bank specific risk factors on the performance of Nepalese commercial banks. Specifically, it examines the relationship of interest rate spread, inflation, credit risk, capital adequacy ratio, liquidity risk, and operational risk with performance of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 13 Nepalese commercial banks from 2014/15 to 2022/23, leading to a total of 117 observations. The study employed convenience sampling method. The main sources of data collected from Bank Supervision Report published by Nepal Rastra Bank (NRB), annual reports of the selected commercial banks, World Bank and OECD Inflation CPI indicator. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period

and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	Observations
1	Agricultural Development Bank Limited	2014/15-2022/23	9
2	Citizens Bank International Limited	2014/15-2022/23	9
3	Everest Bank Limited	2014/15-2022/23	9
4	Himalayan Bank Limited	2014/15-2022/23	9
5	Machhapuchchhre Bank Limited	2014/15-2022/23	9
6	Nepal Bank Limited	2014/15-2022/23	9
7	NMB Bank Limited	2014/15-2022/23	9
8	Prabhu Bank Limited	2014/15-2022/23	9
9	Prime Commercial Bank Limited	2014/15-2022/23	9
10	Rastriya Banijya Bank Limited	2014/15-2022/23	9
11	Sanima Bank Limited	2014/15-2022/23	9
12	Siddhartha Bank Limited	2014/15-2022/23	9
13	Standard Chartered Bank Nepal Limited	2014/15-2022/23	9
Total number of observations			117

Source: Annual Reports

Thus, the study is based on the 117 observations.

The model

The model used in this study assumes that performance of commercial banks depends upon interest rate, inflation, and bank specific risk factors. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are interest rate spread, inflation, credit risk, capital adequacy ratio, liquidity risk, and operational risk. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 CAR + \beta_2 NPL + \beta_3 CR + \beta_4 BOPO + \beta_5 INF + \beta_6 IRS + e_{it}$$

$$ROE = \beta_0 + \beta_1 CAR + \beta_2 NPL + \beta_3 CR + \beta_4 BOPO + \beta_5 INF + \beta_6 IRS + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

CAR = Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage.

NPL = Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage.

CR = Credit risk as measured by the ratio of liquid assets to total assets, in percentage.

BOPO = Operational risk as measured by the ratio of operating expenses to operating income, in percentage.

IRS = Interest rate spread as measured by the weighted average interest rate spread, in percentage.

INF = Inflation rate as measured by rate of inflation in a particular year, in percentage.

The following section describes the independent variables used in this study along with hypothesis formulation.

Interest rate spread

Interest rate spread is the difference between two interest rates. It's commonly used in the context of banking and finance to measure the gap between the interest rate a financial institution pays to depositors (savings or deposit rate) and the rate it charges borrowers (loan rate). Khan (2014) examined the impact of interest rate changes on profitability. The study showed that interest rate spread has a positive impact on both return on assets and return on equity. Similarly, Maigua *et al.* (2016) investigated the influence of interest rates on the performance of commercial banks. The study found that there is a direct relationship between interest rate and banks' profitability. Likewise, Noreen *et al.* (2018) analyzed the impact of interest rate changes on profitability. The study showed that there is an optimistic and direct relationship between interest rates spread and banks' profitability. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between interest rate spread and performance of commercial banks.

Inflation

Inflation is the persistent rise in the general price level over a certain period. Inflation has a positive impact on the interest rate (Melaku, 2020). Dang and Bao (2020) analyzed the monetary policy, bank leverage and liquidity. The study found that inflation has a negative impact on bank leverage. Similarly, Khan *et al.* (2021) found that inflation has a negative impact on bank leverage. Likewise, Hoque and Pour (2018) revealed that inflation has a negative impact on performance of banks. Further, Yuksel *et al.* (2018) showed that inflation has a negative relationship with the performance of banks. In addition, Abdul-Rahman *et al.* (2018) concluded that inflation has a negative relationship with return on assets. Moreover, Anarfo (2015) showed that inflation has a negative impact on return on equity. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between inflation and performance of commercial banks.

Non-performing loan

Safitri (2022) examined the role of interest rates on the effect of non-performing loans and capital adequacy ratios on banking profitability. The study found that *non-performing loan has a negative impact on return on assets*. Similarly, Bandara *et al.* (2021) showed that non-performing loans have negative but significant association with return on assets. Likewise, Do *et al.* (2020) revealed that non-performing loans have negative impact on bank's profitability. Further, Pattiruhu (2022) showed that non-performing loan, and loan to deposit ratio have negative impact on profitability of banks. In addition, Azeem and Amara (2014) investigated the effect of non-performing loans on profitability in Bank of Panjab. The study found that there is a negative impact of non-performing loans on profitability of banks. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between non-performing loan and performance of commercial banks.

Credit risk

Hongli *et al.* (2019) revealed that liquidity measured by current assets to current liabilities has a negative but significant impact on return on equity. Similarly, Awulo *et al.* (2019) found that

credit risk significantly and negatively affects the return on asset. Likewise, Lartey *et al.* (2013) found a negative relationship between liquidity and profitability of listed banks in Ghana. Further, Mahdi and Abbes (2018) showed that profitability of the bank measured by return on assets is negatively related to capital and bank liquidity. In addition, Lukorito *et al.* (2014) concluded that liquidity has a statistically significant and negative relationship with banks' profitability. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between credit risk and performance of commercial banks.

Operational risk

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people, systems, or external events. Kusumastuti (2019) found that there is a negative but significant relationship between cost-to-income ratio (BOPO) and return on assets. Similarly, Said & Ali (2016) analyzed the determinants of Profitability in Sharia Public Financing Banks in Indonesia. The study found that BOPO has a negative impact on return on assets. Likewise, Uddin (2022) investigated the effect of non-performing loans on profitability with operating efficiency as an intervening variable. The result revealed that operating efficiency has a negative and insignificant impact on profitability of banks. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between operational risk and performance of commercial banks.

Capital adequacy ratio

Capital adequacy ratio defined as bank capital divided by total risk weight. Surtikanti *et al.* (2022) found that capital adequacy ratio has a positive impact on profitability of banks. Similarly, Nguyen (2020) examined the effect of capital adequacy on bank profitability in the context of Vietnam. The study found that capital adequacy ratio has a positive impact on return on assets. Likewise, Kumar *et al.* (2020) investigated the relationship between monetary policy and financial performance in New Zealand. The study revealed that capital adequacy ratio is positively related to return on assets. Further, Almumani (2013) showed a positive relationship between capital adequacy ratio and performance of Jordanian banks. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between capital adequacy ratio and performance of commercial banks.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2014/15 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 13 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CR (Credit risk as measured by the ratio of liquid assets to total assets, in percentage), BOPO, (Operational risk as measured by the ratio of operating expenses to operating income, in percentage), IRS (Interest rate spread as measured by the weighted average interest rate spread, in percentage), and INF (Inflation rate as measured by rate of inflation in a particular year, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.08	3.22	1.57	0.54
ROE	0.89	42.94	15.06	5.92
CAR	7.49	22.99	13.74	2.54
NPL	0.01	8.33	1.90	1.64
CR	3.23	56.98	19.04	11.46
BOPO	15.03	77.86	41.07	9.94
IRS	3.15	7.04	5.87	3.35
INF	4.15	8.36	6.31	1.42

Sources: SPSS Software

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 13 Nepalese commercial banks for the study period of 2014/15 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CR (Credit risk as measured by the ratio of liquid assets to total assets, in percentage), BOPO, (Operational risk as measured by the ratio of operating expenses to operating income, in percentage), IRS (Interest rate spread as measured by the weighted average interest rate spread, in percentage), and INF (Inflation rate as measured by rate of inflation in a particular year, in percentage).

Variables	ROA	ROE	CAR	NPL	CR	BOPO	IRS	INF
ROA	1							
ROE	0.734**	1						
CAR	0.274**	0.079	1					
NPL	-0.066	-0.066	-0.211*	1				
CR	-0.227**	-0.103	0.526**	-0.256**	1			
BOPO	-0.318**	-0.122	-0.242**	0.609**	-0.063	1		
IRS	0.019	0.015	-0.050	-0.046	0.005	-0.069	1	
INF	-0.187*	-0.003	-0.277**	0.181*	0.023	0.309**	-0.132	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 3 shows that capital adequacy ratio has a positive relationship with return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. However, non-performing loan has a negative relationship with return on assets. It indicates that increase in non-performing loan leads to decrease in return on assets. Similarly, credit risk has a negative relationship with return on assets. It indicates that increase in credit risk leads to decrease in return on assets. Likewise, operational risk has a negative relationship with return on assets. It indicates that increase in operating cost ratio leads to decrease in return on assets. In contrast, interest rate spread has a positive relationship with return on assets. It indicates that increase in interest rate spread leads to increase in return on assets. However, inflation has a negative relationship return on assets. It indicates that higher the inflation, lower would be the return on assets.

Similarly, the result also shows that capital adequacy ratio has a positive relationship with return on equity. It indicates that increase in capital adequacy ratio leads to increase in return on equity. However, non-performing loan has a negative relationship with return on equity. It indicates that increase in non-performing loan leads to decrease in return on equity. Similarly, credit risk has a negative relationship with return on equity. It indicates that increase in credit risk leads to decrease in return on equity. Likewise, operational risk has a negative relationship with return on equity. It indicates that increase in operating cost ratio leads to decrease in return on equity. In contrast, interest rate spread has a positive relationship with return on equity. It indicates that increase in interest rate spread leads to increase in return on equity. However, inflation has a negative relationship return on equity. It indicates that higher the inflation, lower would be the return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of interest rate spread, inflation, credit risk, capital adequacy ratio, liquidity risk, and operational risk with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of interest rate spread, inflation, credit risk, capital adequacy ratio, liquidity risk, and operational risk on return on assets

The results are based on panel data of 13 Nepalese commercial banks with 117 observations for the study period from 2014/15 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 CAR + \beta_2 NPL + \beta_3 CR + \beta_4 BOPO + \beta_5 INF + \beta_6 IRS + e_{it}$ where the dependent variables is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CR (Credit risk as measured by the ratio of liquid assets to total assets, in percentage), BOPO, (Operational risk as measured by the ratio of operating expenses to operating income, in percentage), IRS (Interest rate spread as measured by the weighted average interest rate spread, in percentage), and INF (Inflation rate as measured by rate of inflation in a particular year, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		CAR	NPL	CR	BOPO	IRS	INF			
1	0.772 (2.918)**	0.274 (3.053)**						0.067	0.518	9.318
2	1.608 (21.111)**		-0.066 (0.713)					0.004	0.537	0.508
3	1.364 (14.459)**			-0.227 (2.503)*				0.043	0.524	6.265
4	2.271 (11.264)**				-0.318 (3.593)**			0.093	0.511	12.907
5	1.564 (30.483)**					0.019 (0.207)		0.008	0.538	0.043
6	2.013 (8.965)**						-0.187 (2.037)*	0.026	0.529	4.151
7	0.783 (2.711)**	0.272 (2.951)**	-0.009 (0.098)					0.59	0.52	4.624
8	0.836 (2.856)**	0.214 (2.015)*	-0.009 (0.093)	-0.117 (1.088)				0.06	0.519	3.482
9	1.871 (5.013)**	0.113 (1.104)	-0.286 (2.585)**	-0.212 (2.054)*	-0.451 (4.090)**			0.175	0.487	7.158
10	1.867 (4.940)**	0.114 (2.573)**	-0.286 (2.573)**	-0.212 (2.040)*	-0.451 (4.057)**	0.006 (0.072)		0.168	0.489	5.676
11	2.109 (4.616)**	0.83 (0.767)	-0.289 (2.596)**	-0.232 (2.188)*	-0.432 (3.827)**	0.006 (0.067)	-0.089 (0.943)	0.167	0.489	4.874

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for capital adequacy ratio are positive with return on

assets. It indicates that capital adequacy ratio has a positive impact on return on assets. This finding is similar to the findings of Surtikanti *et al.* (2022). However, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is consistent with the findings of Safitri (2022). Similarly, the beta coefficients for credit risk are negative with return on assets. It indicates that credit risk has a negative impact on return on assets. This finding is consistent with the findings of Awulo *et al.* (2019). Likewise, the beta coefficients for operational risk are negative with return on assets. It indicates that operational risk has a negative impact on return on assets. This finding is similar to the findings of Kusumastuti (2019). In contrast, the beta coefficients for interest rate spread are positive with return on assets. It indicates that interest rate spread has a positive impact on return on assets. This finding is similar to the findings of Maigua *et al.* (2016). However, the beta coefficients for inflation are negative with return on assets. It indicates that inflation has a negative impact on return on assets. This finding is consistent with the findings of Dang and Bao (2020).

Table 5 shows the regression results of interest rate spread, inflation, credit risk, capital adequacy ratio, liquidity risk, and operational risk on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of interest rate spread, inflation, credit risk, capital adequacy ratio, liquidity risk, and operational risk on return on equity

The results are based on panel data of 13 Nepalese commercial banks with 117 observations for the study period from 2014/15 to 2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 CAR + \beta_2 NPL + \beta_3 CR + \beta_4 BOPO + \beta_5 INF + \beta_6 IRS + e_i$, where the dependent variables is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CR (Credit risk as measured by the ratio of liquid assets to total assets, in percentage), BOPO, (Operational risk as measured by the ratio of operating expenses to operating income, in percentage), IRS (Interest rate spread as measured by the weighted average interest rate spread, in percentage), and INF (Inflation rate as measured by rate of inflation in a particular year, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		CAR	NPL	CR	BOPO	IRS	INF			
1	17.581 (5.804)**	0.079 (0.847)						0.002	5.930	0.717
2	14.604 (17.361)**		-0.066 (0.714)					0.004	5.935	0.510
3	14.048 (13.198)**			-0.103 (1.108)				0.002	5.917	1.227
4	18.049 (7.744)**				-0.122 (1.319)			0.006	5.904	1.740
5	15.081 (26.608)**					0.015 (0.156)		0.008	5.948	0.024
6	14.971 (5.930)**						-0.003 (0.036)	0.009	5.948	0.001
7	16.871 (5.106)**	0.068 (0.710)	-0.052 (0.547)					0.009	5.948	0.506
8	17.942 (5.423)**	0.175 (1.605)	-0.085 (0.888)	-0.216 (1.967)				0.016	50875	1.635
9	26.717 (6.137)**	0.252 (2.325)*	-0.298 (2.547)**	-0.290 (2.652)**	-0.346 (2.972)**			0.080	5.681	3.519
10	26.964 (6.120)**	0.256 (2.345)*	-0.298 (2.538)**	-0.292 (2.659)**	-0.35 (2.984)**	0.039 (0.435)		0.073	5.702	2.833
11	27.913 (5.222)**	0.267 (2.322)*	-0.299 (2.535)**	-0.299 (2.657)**	-0.343 (2.870)**	0.043 (0.475)	-0.032 (0.316)	0.066	5.725	2.358

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on equity is the dependent variable.

Table 5 shows that the beta coefficients for capital adequacy ratio are positive with return on

equity. It indicates that capital adequacy ratio has a positive impact on return on equity. This finding is similar to the findings of Nguyen (2020). However, the beta coefficients for non-performing loan are negative with return on equity. It indicates that non-performing loan has a negative impact on return on equity. This finding is consistent with the findings of Bandara *et al.* (2021). Similarly, the beta coefficients for credit risk are negative with return on equity. It indicates that credit risk has a negative impact on return on equity. This finding is similar to the findings of Lartey *et al.* (2013). Likewise, the beta coefficients for operational risk are negative with return on equity. It indicates that operational risk has a negative impact on return on equity. This finding is similar to the findings of Said & Ali (2016). In contrast, the beta coefficients for interest rate spread are positive with return on equity. It indicates that interest rate spread has a positive impact on return on equity. This finding is consistent with the findings of Noreen *et al.* (2018). However, the beta coefficients for inflation are negative with return on equity. It indicates that inflation has a negative impact on return on equity. This finding is similar to the findings of Khan *et al.* (2020).

4. Summary and conclusion

Financial institutions play an important role in the management and circulation of capital in the economy. Especially, commercial banks play a vital role in the allocation of resources in the nation. A commercial bank is a financial institution which performs the function of accepting deposits from the public and granting loans for investment to channel funds from depositors to investors continuously. In short, commercial banks want to be sustainable by providing services for businesses, organizations, and individuals to perform their well intermediation function. Banking sector acts as the life blood of modern trade and commerce to provide them with a major source of finance. This increasing phenomenon of globalization has made the concept of efficiency more important both for the non-financial and financial institutions and banks are the part of them. Banks largely depend on competitive marketing strategy that determines their success and growth.

This study attempts to examine the effects of interest rate, inflation, and bank specific risk factors on the performance of Nepalese commercial banks. The study is based on secondary data of 13 commercial banks with 117 observations for the study period from 2014/15 to 2022/23.

The major conclusion of the study is that capital adequacy ratio and interest rate spread have positive impact on return on assets and return on equity. It indicates that higher the capital adequacy ratio and interest rate spread, higher would be the return on assets and return on equity. However, non-performing loans, credit risk, operational risk, and inflation have negative impact on return on assets and return on equity. It indicates that higher the non-performing loans, credit risk, operational risk, and inflation, lower would be the return on assets and return on equity. Likewise, the study also concluded that operational risk followed by capital adequacy ratio is the most influencing factor that explains the changes in the return on assets in the context of Nepalese commercial banks. Similarly, the study also concluded that operational risk followed by credit risk is the most influencing factor that explains the changes in the return on equity in the context of Nepalese commercial banks.

References

- Abdul-Rahman, A., A. A. Sulaiman, & N. L. H. M. Said, 2018. Does financing structure affect bank liquidity risk? *Pacific-Basin Finance Journal* 52(6), 26-39.
- Adam, M., R. Safitri, & T. Wahyudi, 2018. Effect of company size, liquidity and operational efficiency on bank profitability with problem credit risk as a moderating variable at commercial banks that are listed on the Indonesia stock exchange. *Journal Perspectives on Regional Finance and Development* 6(3), 331-344.
- Adhikari, P. R., 2021. Efficiency, profitability and stability of Nepalese commercial banks. *The Batuk* 7(2), 15-36.
- Ahmed, A., & M. Ahmad, 2017. The effect of capital adequacy on profitability: A comparative study between

- Samba and banks of Saudi Arabia. *International Journal of Economics, Commerce and Management* 5(11), 86-10.
- Akter, R., & J. K. Roy, 2017. The impacts of non-performing loan on profitability: An empirical study on banking sector of Dhaka stock exchange. *International Journal of Economics and Finance* 9(3), 126-132.
- Almumani, M. A., 2013. Impacts of managerial factors on commercial financial performance: Empirical evidence from Jordan. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 3(3), 298-310.
- Al-Tamimi, K. A. M., and S. F. Obeidat, 2013. Determinants of capital adequacy in commercial banks of Jordan and empirical study. *International Journal of Academic Research in Economics and Management Sciences* 2(4), 44-58.
- Anarfo, E. B., 2015. Determinants of capital structure of banks: Evidence from Sub-Sahara Africa. *Asian Economic and Financial Review* 5(4), 624-640.
- Angsoyiri, D., 2021. Impact of non-performing loans on bank profitability: Empirical evidence from commercial banks in Ghana. *Przedsiębiorstwo we współczesnej gospodarce-teoria i praktyka* 33(2), 20-35.
- Athanasoglou, P. P., M. Delis, & C. Staitouras, 2006. Determinants of profitability in the southeastern European regions. *Journal of Financial Decision Making* 2, 1-17.
- Awulo, T., A. Alemu, & B. W. Chala, 2011. Impact of liquidity on profitability of bank: A case of commercial bank of Ethiopia. *Research Journal of Finance and Accounting* 10(1), 26-32.
- Azeem, A., & K. Amara, 2014. Impact of profitability on quantum of non-performing loans. *International Journal of Multidisciplinary Consortium* 1(1), 1-14.
- Bandara, H. M. K. S., A. L. M. Jameel, & H. Athambawa, 2021. Credit risk and profitability of banking sector in Sri Lanka. *Journal of Economics, Finance and Accounting Studies* 3(1), 65-71.
- Brastama, R. F., and I. P. Yadnya, 2020. The effect of capital adequacy ratio and non-performing loan on banking stock prices with performance as intervening variable. *American Journal of Humanities and Social Sciences Research* 4(12), 43-49.
- Chalise, S., 2019. The impact of capital adequacy ratio and cost-income ratio on the performance of Nepalese commercial banks. *International Journal of Economics and Management* 6(7), 78-83.
- Chhetri, S. B., 2023. Credit risk, liquidity risk, and profitability in Nepalese commercial banks. *International Journal of Finance and Commerce* 5(1), 24-31.
- Chou, T. K., and A. D. Buchdadim, 2016. Bank performance and its underlying factors: A study of rural banks in Indonesia. *Accounting and Finance Research* 5(3), 55-63.
- Dang, V. D., & N. K. Q. Bao, 2020. Monetary policy, bank leverage, and liquidity. *International Journal of Managerial Finance* 17(4), 619-639.
- Dao, B., 2020. Bank capital adequacy ratio and bank performance in Vietnam: A simultaneous equations framework. *Journal of Asian Finance, Economics and Business* 7(6), 39-46.
- Do, H., T. Ngo, & Q. Phung, 2020. The effect of non-performing loans on profitability of commercial banks: Case of Vietnam. *Accounting* 6(3), 373-386.
- Francis, M. E., 2007. Determinants of commercial bank profitability in Sub-Saharan Africa. *International Journal of Economics and Finance* 5(9), 134-143.
- Hadian, N., 2021. The effect of non-performing loans and loan to deposit ratio on return on assets in the banking industry. *Turkish Journal of Computer and Mathematics Education* 12(8), 791-798.
- Hongli, J., E. S. Ajorsu, & E. K. Bakpa, 2019. The effect of liquidity and financial leverage on firm performance: Evidence from listed manufacturing firms on the Ghana stock exchange. *Research Journal of Finance and Accounting* 10(8), 91-100.

- Hoque, H., & E. K. Pour, 2018. Bank-level and country-level determinants of bank capital structure and funding sources. *International Journal of Finance & Economics* 23(4), 504-532.
- Khan, S., U. Bashir, & M. S. Islam, 2021. Determinants of capital structure of banks: evidence from the Kingdom of Saudi Arabia. *International Journal of Islamic and Middle Eastern Finance and Management* 14(2), 268-285.
- Khan, W. A., 2014. Impact of interest rate changes on the profitability of four major commercial banks in Pakistan. *International Journal of Accounting and Financial Reporting* 4(1), 142-154.
- Kumar, V., S. Acharya, and L. T. Ho, 2020. Does monetary policy influence the performance of banks in New Zealand? *International Journal of Financial Studies* 8(2), 35-52.
- Kusumastuti, W. I., & A. Alam, 2019. Analysis of impact of CAR, NPF, BOPO on profitability of Islamic banks (Year 2015-2017). *Journal of Islamic Economic Laws* 2(1), 30-59.
- Lartey, V. C., S. Antwi, & E. K. Boadi, 2013. The relationship between liquidity and profitability of listed banks in Ghana. *International Journal of Business and Social Science* 4(3), 48-56.
- Lawati, L., 2021. The effect of loan to deposit ratio and debt to equity ratio on return on equity. *Journal of Management and Business* 5(1), 101-107.
- Lukorito, S. N., W. Muturi, A. S. Nyangau, & D. Nyamasege, 2014. Assessing the effect of liquidity on profitability of commercial banks in Kenya. *Research Journal of Finance and Accounting* 5(19), 145-152.
- Mahdi, I. B. S., & M. B. Abbes, 2018. Relationship between capital, risk, and liquidity: A comparative study between Islamic and conventional banks in the MENA region. *Research in International Business and Finance* 45(1), 588-596.
- Maigwa, C., & G. Mouni, 2016. Influence of interest rates determinants on the performance of commercial banks in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 6(2), 121-133.
- Melaku, W. E., 2020. Determinants of inflation in Africa: A systematic review. *International Journal of Management and Fuzzy Systems* 6(4), 59-69.
- Nguyen, T. H., 2020. Impact of bank capital adequacy on bank profitability under Basel II accord: Evidence from Vietnam. *Journal of Economic Development* 45(1), 31-46.
- Noreen, S., A. Liaqat, & F. Parveen, 2018. Interest rate changes and its impact on the profitability of Pakistani commercial banks. *International Journal of Academic Research in Business and Social Sciences* 8(12), 948-954.
- Pattiruhu, J., 2022. BOPO analysis, non-performing loan, and loan to deposit ratio to profitability. *Journal of Entrepreneurship* 1(2), 45-63.
- Patwary, M. S. H., & N. Tasneem, 2019. Impact of non-performing loan on profitability of banks in Bangladesh: A study from 1997 to 2017. *Global Journal of Management and Business Research* 19(1), 13-27.
- Poudel, S. R., 2018. Impact of credit risk on profitability of commercial banks in Nepal. *Journal of Applied and Advanced Research* 3(6), 161-170.
- Pradhan, R. S., & P. Parajuli, 2017. Impact of capital adequacy and cost-income ratio on the performance of Nepalese commercial banks. *International Journal of Management Research* 8(1), 6-18.
- Rahman, M. M., M. K. Hamid, and M. A. M. Khan, 2015. Determinants of financial performance: Empirical evidence from Bangladesh. *International Journal of Business and Management* 10(8), 135-150.
- Ruziqa, A., 2013. The impact of credit and liquidity risk on bank financial performance: the case of Indonesian Conventional Bank with total asset above 10 trillion Rupiah. *International Journal of Economic Policy in Emerging Economies* 6(2), 93-106.
- Safitri, M., 2022. The role of interest rates on the effect of non-performing loans and capital adequacy ratios

- on banking profitability: Case study on conventional commercial banks listed on the Indonesia stock exchange. *Journal of Finance* 1(7), 1785-1796.
- Said, M., & H. Ali, 2016. An analysis on the factors affecting profitability level of Sharia banking in Indonesia. *Banks & Bank Systems* 11(3), 28-36.
- Saleh, D. S., & E. Winarso, 2021. Analysis of non-performing loans (NPL) and loan to deposit ratio (LDR) towards profitability. *International Journal of Multicultural and Multireligious Understanding* 8(1), 423-436.
- Samad, A., 2015. Determinants bank profitability: Empirical evidence from Bangladesh commercial banks. *International Journal of Financial Research* 6(3), 173-179.
- Solihati, G. P., 2020. Analysis of factors affecting banking performance. *International Journal of Management Studies and Social Science Research* 2(6), 36-48.
- Sukmadewi, R., 2020. The effect of capital adequacy ratio, loan to deposit ratio, operating-income ratio, non-performing loans, net interest margin on banking financial performance. *ECO-Buss* 2(2), 1-10.
- Sunaryo, D., 2020. The effect of capital adequacy ratio (CAR), net interest margin (NIM), non-performing loan (NPL), and loan to deposit ratio (LDR) against return on asset (ROA) in general banks in Southeast Asia. *Illomata International Journal of Management* 1(4), 149-158.
- Surtikanti, S., A. Saepudin, Y. Arizona, & S. D. Anggadini, 2022. The influence of capital adequacy ratio (CAR) and net interest margin (NIM) on profitability. *Indonesian Journal of Economics, Social, and Humanities* 4(2), 111-122.
- Tassew, A. W., & A. A. Hailu, 2019. The effect of risk management on financial performance of commercial banks in Ethiopia. *Financial Studies* 23(1), 25-38.
- Uddin, M. K., 2022. Effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. *European Journal of Business and Management Research* 7(3), 289-295.
- Utu, L., 2019. Analysis on non-performing loan, net interest margin, and loan to deposit ratio as well as their effects on return on asset in bank Sultra. *International Journal of Civil Engineering and Technology* 10(09), 313-324.
- Yuksel, S., S. Mukhtarov, E. Mammadov, & M. Ozsari, (2018). Determinants of profitability in the banking sector: an analysis of post-soviet countries. *Economies* 6(3), 41.
- Zribi, N., and B. Younes, 2011. The factors influencing bank credit risk: The case of Tunisia. *Journal of Accounting and Taxation* 3(4), 70-78.

Chapter 22

Impact of risk management on the profitability of Nepalese commercial banks

- Sujata Balami*

Abstract

This study examines the impact of risk management on the profitability of Nepalese commercial banks. Return on assets and return on equity are the selected dependent variables. The selected independent variables are non-performing loan, capital adequacy ratio, cash reserve ratio, loan-to-deposit ratio, current ratio, and cash to deposit ratio. The study is based on secondary data of 11 commercial banks with 121 observations for the study period from 2012/13 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of risk management on the profitability of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive impact on return on assets and return on equity. It indicates that increase in capital adequacy ratio leads to increase in return on assets and return on equity. However, non-performing loan has a negative impact on return on assets and return on equity. It indicates that increase in non-performing loan leads to decrease in return on assets and return on equity. Likewise, loan to deposit ratio has a negative impact on return on assets and return on equity. It indicates that higher the loan to deposit ratio, lower would be the return on assets and return on equity. Further, cash reserve ratio has a negative impact on return on assets and return on equity. It indicates that increase in cash reserve ratio leads to decrease in return on assets and return on equity. In contrast, cash to deposit ratio has a positive impact on return on assets and return on equity. It indicates that increase in cash to deposit ratio leads to increase in return on assets and return on equity. However, current ratio has a negative impact on return on assets and return on equity. It indicates that increase in current ratio leads to decrease in return on assets and return on equity.

Keywords: non-performing loan, capital adequacy ratio, cash reserve ratio, loan-to-deposit ratio, current ratio, cash to deposit ratio, return on assets, return on equity

1. Introduction

The banking sector is the driving force for a country's economy. Bank is a business entity that collects funds from the public in the form of deposits and distributes funds to the public in the form of credit and or other forms. Bank performance greatly affects the level of public trust, so it is important for banks to maintain good performance (Safitri *et al.*, 2020). Poor bank performance will lead to failure and lead to financial crises that will have negative consequences for economic development (Nuhui *et al.*, 2017). Profit is one of the main goals of the banking industry. The financial performance is the company's ability to earn profits or a measure of the effectiveness of company management. A high level of the financial performance can indicate that the bank is working efficiently. A high level of the financial performance can also illustrate that the productivity of the bank is getting better, and can show the development of the bank itself. Therefore, the financial performance is very important both for the bank itself and for the customers and prospective customers of the bank (Suyono *et al.*, 2017). In today's fast-moving business environment, banks are exposed to a large number of risks such as credit risk, liquidity risk, market risk, operational risk, exchange risk etc. Due to such exposure to various risks, efficient risk management is required. Managing risk is one of the basic tasks to be done, once it has been identified and known.

Commercial banks play a significant and energetic role for developing an economy of a country. When the banking sector in a country is functioning in an efficient, effective, and disciplined

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way it leads to bring a rapid growth in the various sectors in the country. Many factors may impact on the financial performance of commercial banks. Basically, it can be categorized as bank internal factors and bank external factors. Bank internal or specific factors are capital adequacy, liquidity, operating expenses, assets quality, managerial efficiency, bank size and etc. Athanasoglou *et al.* (2006) stated that the banking sector acts as the life blood of modern trade and commerce to provide them with a major source of finance. This increasing phenomenon of globalization has made the concept of efficiency more important both for the non-financial and financial institutions and banks are the part of them. Banks largely depends on competitive marketing strategy that determines their success and growth. The modalities of the banking business have changed a lot in the new millennium compared to the way they used to be in the years bygone (Hussain and Bhatti, 2010). Shafiq and Nasr (2010) argued that managing a risk in advance is far better than waiting for its occurrence. Similarly, the success of conventional financial institutions is one of the most important topics that stir the interest of researchers in the financial field. Likewise, the study analyzed internal and external factors that have statistically significant effect in the success of conventional financial institutions (Ariffin and Tafri, 2014)

Ramadhanti *et al.* (2019) examined the effect of capital adequacy, liquidity and credit risk to the financial performance of commercial banks. The study revealed that capital adequacy ratio (CAR) has a significant positive effect on the financial performance. However, non-performing loans (NPL) has a negative and significant effect on the financial performance. Similarly, Rajindra *et al.* (2021) examined the effect of costs and operational revenue, loan-to-deposit ratio on return on assets in the context of Indonesia. The study found that operational costs, operational income, and loan-to-deposit ratio have a significant effect on ROA. Similarly, operational costs and operational income have a significant negative impact on return on assets. Moreover, Setiawan and Nupus (2021) analyzed the effect of capital adequacy ratio and loan-to-deposit ratio on banking the financial performance. The result found that capital adequacy ratio (CAR) and loan-to-deposit ratio (LDR) have a positive and significant influence on the financial performance in State Owned Banks. However, only asset size has positive and significant effect on the financial performance in foreign bank. Similarly, Agustiningrum (2013) analyzed non-performing loans (NPL) and loan-to-deposit ratio (LDR) towards the financial performance. The study showed that loan-to-deposit ratio has a positive and significant effects on the financial performance. In contrast, Ahmad *et al.* (2012) revealed that loan-to-deposit ratio has a negative and significant effects on the financial performance.

Liyana and Indrayani (2020) investigated the effect of non-performing loans, loan-to-deposit ratio, and net interest margin on the financial performance (return on assets). The study showed that loan-to-deposit ratio has a positive relationship with return on assets. Similarly, Ogunbiyi (2014) found no relationship between credit to deposit ratio and the financial performance measured by return on assets and return on equity. However, Sunaryo (2020) showed a negative relationship between loan-to-deposit ratio and return on assets of general banks in Southeast Asia. Likewise, Amenawo *et al.* (2016) examined the effect of currency fluctuation on commercial banks the financial performance. The study revealed that capital adequacy ratio has a positive relationship with return on assets. However, Dodi *et al.* (2018) concluded that capital adequacy ratio has a negative relationship with return on assets and return on equity.

Brastama and Yadnya (2020) analyzed the effect of capital adequacy ratio and non-performing loans on banking stock prices with the financial performance as intervening variable. The results found that capital adequacy ratio has a positive effect on return on assets. Similarly, the non-performing loans has a negative effect on the return on assets. Moreover, Sukmadewi (2020) examined the effect of capital adequacy ratio, loan-to-deposit ratio, operating-income ratio, non-performing loans, and net interest margin on banking the financial performance. The results revealed that capital adequacy

ratio, non-performing loans, and loan-to-deposit ratio has a positive and significant effect on return on assets. Similarly, Solihati (2020) analyzed the factors affecting banking the financial performance. The results revealed that non-performing loans and capital adequacy ratio have significant effect on ROA. Meanwhile, non-performing loans has a significant negative effects on return on assets (ROA) and capital adequacy ratio is not significantly affected by return on assets (ROA). Moreover, Utu (2019) examined non-performing loans, net interest margin, and loan-to-deposit ratio as well as their effects on return on asset in bank Sultra. The results revealed that non-performing loans (NPL) and loan-to-deposit ratio (LDR) have positive and significant effects on return on assets (ROA).

Ahmed *et al.* (2021) examined the macro-economic and bank specific determinants of non-performing loans (NPLs) for commercial banks. The study showed that non-performing loans has a significant negative relationship with return on assets. Similarly, Sawitri (2018) also revealed that non-performing loans has a negative relationship with return on assets. However, Ahmad and Bashir (2013) found a positive relationship between non-performing loans and return on assets but negative relationship between non-performing loans and return on equity. Further, Hassan and Ahmed (2019) examined the impact of bank specific characteristics in determining the Islamic banking the financial performance in Bangladesh. The study concluded that there is a negative relationship between bank size and return on assets. However, Sufian and Habibullah (2009) exhibited that banks size is positively related to the financial performance of Chinese banking sector. Similarly, Hadian (2021) examined the effect of non-performing loans and loan-to-deposit ratio on return on assets in the banking industry. The study revealed that non-performing loans has a negative effect on return on assets. Similarly, loan-to-deposit ratio has a positive and significant impact on return on assets. Similarly, Lawati (2021) examined the effect of loan-to-deposit ratio and debt to equity ratio on return on equity. The results showed that loan-to-deposit ratio partially has a positive and significant effect on return on equity.

In the context of Nepal, Chalise (2019) examined the impact of capital adequacy ratio and cost income ratio on the performance of Nepalese commercial banks. The study revealed that capital adequacy ratio has a negative insignificant impact with bank performance measured by return on assets (ROA). However, bank size has a positive insignificant impact on bank performance. Moreover, Adhikari *et al.* (2020) assessed the impact of bank capital, liquidity, and credit risk on the financial performance of Nepalese commercial banks. The study stated that liquidity ratio and non-performing loans have negative impact on return on assets (ROA) and return on equity (ROE). The study also revealed that bank capital has a significant impact on the financial performance of Nepalese commercial banks. Further, Budhathoki *et al.* (2020) examined the impact of liquidity, leverage, and total size on banks' the financial performance. The study revealed that loan-to-deposit ratio has a negative effect on the bank's return on assets (ROA) and return on equity (ROE).

Neupane (2020) found that the financial performance of Nepalese commercial banks is insignificantly affected by size of bank, deposit amount, capital base, loan and advances, number of branches and activities relating to off-balance sheet as the internal factors. Similarly, Gnawali (2018) analyzed the non-performing asset and its effects on the financial performance of Nepalese commercial banks. The study found a negative effect of the non-performing loans on return on assets (ROA) in the context of Nepali public banks. Moreover, capital adequacy ratio, loan-to-deposit ratio and loan loss provision have a positive relationship with the financial performance of banks in Nepal. Moreover, Khati (2020) examined the impact of liquidity on the financial performance of Nepalese commercial banks. The study found that credit to deposit ratio has a positive significant relationship with bank the financial performance.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of risk management on the profitability of commercial banks. Though there are above mentioned

empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of risk management on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of non-performing loan, capital adequacy ratio, cash reserve ratio, loan-to-deposit ratio, current ratio, and cash to deposit ratio with profitability of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 11 Nepalese commercial banks from 2012/13 to 2022/23, leading to a total of 121 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	Observations
1	Agricultural Development Bank Limited	2012/13-2022/23	11
2	Citizens International Bank Limited	2012/13-2022/23	11
3	Everest Bank Limited	2012/13-2022/23	11
4	Nepal Bank Limited	2012/13-2022/23	11
5	Nepal SBI Bank Limited	2012/13-2022/23	11
6	NIC Asia Bank Limited	2012/13-2022/23	11
7	NMB Bank Limited	2012/13-2022/23	11
8	Rastriya Banijya Bank Limited	2012/13-2022/23	11
9	Sanima Bank Limited	2012/13-2022/23	11
10	Siddharth Bank Limited	2012/13-2022/23	11
11	Standard Chartered Bank Nepal Limited	2012/13-2022/23	11
Total number of observations			121

Thus, the study is based on the 121 observations.

The model

The model used in this study assumes that profitability depends upon risk management. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are non-performing loan, capital adequacy ratio, cash reserve ratio, loan-to-deposit ratio, current ratio, and cash to deposit ratio. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 CRR_{it} + \beta_4 LDR_{it} + \beta_5 CR_{it} + \beta_6 CDR_{it} + e_{it}$$

$$ROE = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 CRR_{it} + \beta_4 LDR_{it} + \beta_5 CR_{it} + \beta_6 CDR_{it} + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

NPL= Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage.

CAR= Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage.

CRR = Cash reserve ratio as measured by the percentage of money keep in central bank, in percentage.

LDR = Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

CR = Current ratio as measured by the ratio of current assets to current liabilities, in percentage.

CDR = Cash to deposit ratio as measured by the ratio of total cash to total deposits, in percentage.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Capital adequacy ratio

Handayani *et al.* (2019) analyzed the determinants of Islamic commercial bank the financial performance in Indonesia. The study revealed that capital adequacy ratio is positively related to return on assets. Similarly, Nahar *et al.* (2020) identified a positive relationship between capital adequacy ratio and the financial performance. Likewise, Farkasdi *et al.* (2021) determined the determinants of the financial performance in commercial banks in Germany. The study showed a positive relationship between capital adequacy ratio and the financial performance measured by return on equity. Further, Olalekan and Adeyinka (2013) found a positive relationship between capital adequacy ratio and the financial performance of Nigerian banks. However, Sayani *et al.* (2017) found that there is a negative relationship between capital adequacy ratio and the financial performance. Based on it, this study develops the following hypothesis:

H₁: There is positive relationship between capital adequacy ratio and profitability of banks.

Non-performing loan

Non-performing loans is measured as the percentage of non-performing loans to total loans. The level of credit crunch is usually peroxide by the ratio of bank's non-performing loans (Alexandri and Santoso, 2015). Kadioglu and Ocal (2017) investigated whether non-performing loans affect the bank's the financial performance in Turkey. The study found that non-performing loans has a negative relationship with return on assets and return on equity. Similarly, a non-performing loans, also known as an NPL, is a loan where the borrower has stopped paying the installments on the principal (original amount) and interest (Singh *et al.*, 2021). Islam and Rana (2017) revealed a significant negative relationship between non-performing loans and the financial performance of banks in Bangladesh as measured by return on equity. Likewise, Better performance of financial institutions plays a significant role in the economic development of a country. The loan is one of the major components of the earning assets of a commercial bank. However, increase in nonperforming loan leads to decrease in bank performance and efficiency (Farhan *et al.*, 2012). Based on it, this study develops the following

hypothesis:

H₂: There is a negative relationship between non-performing loan and profitability of banks.

Loan to deposit ratio

Yigermal (2017) analyzed the impact of bank specific and macro-economic factors on the financial performance of selected Ethiopian private commercial banks. The study concluded that credit to deposit ratio is negatively related to the financial performance. Similarly, Golubeva *et al.* (2019) showed that credit to deposit ratio has a negative relationship with return on equity. Likewise, Mohanty and Krishnankutty (2018) showed that return on asset has a negative and significant relationship with credit to deposit ratio. However, Steven and Toni (2020) found that credit to deposit ratio has a positive relationship with the financial performance. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between loan to deposit ratio and profitability of banks.

Cash reserve ratio

Cash reserve ratio is a regulatory measure used by central banks to control the amount of funds that commercial banks must hold in reserve, rather than lending out or investing. Abidi & Lodhi (2015) examined the effect of changes in CRR on commercial banking profitability and how it affects the ROE and ROA. The study revealed that cash reserve ratio has a significant inverse relationship on banks financial performance, which is measured by return on assets and return on equity. Similarly, Hoque *et al.* (2020) analyzed the impact of monetary policy, especially cash reserve ratio on the commercial bank's profitability. The study found that cash reserve ratio has negative impact on profitability of commercial banks. Likewise, Oganda *et al.* (2018) assessed the effect of cash reserves on performance of commercial banks in Kenya. The study showed that cash reserves has a strong negative correlation with return on equity giving a significant negative relationship with performance of Equity bank. Further, Olagunju & Isiaka (2021) investigated the impact of cash reserve requirement on the profitability of deposit money banks in Nigeria. The study revealed that cash reserve requirement has an inverse relationship with profitability of banks. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between cash reserve ratio and profitability of banks.

Cash to deposit ratio

Cash to deposit ratio is a financial metric used to evaluate the proportion of a bank's cash reserves relative to its total deposits. Bagh *et al.* (2017) examined the impact of liquidity management on the profitability of Pakistani banks, covering period of 2006-2016. The result stated that cash to deposit ratio has a positive and significant impact on return on assets. Similarly, Mohanty & Mehrotra (2018) assessed the effect of liquidity management on the profitability of public and private sector banks in India. The study revealed that there is a significant but negative impact of cash to deposit ratio on return on assets. Likewise, Akber & Dey (2020) analyzed the impact of liquidity on commercial bank's profitability in the banking sector of Bangladesh. The outcome of the study stated that the impact of liquidity on commercial bank's profitability in Bangladesh is not statistically significant. Further, Shaibu & Okafor (2020) examined the relationship between liquidity and profitability of deposit money banks in Nigeria using panel approach. The empirical results showed that there is a negative but statistically significant relationship between cash to total deposit ratio and profitability. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between cash to deposit ratio and profitability of banks.

Current ratio

Current ratio is a financial ratio that is used to assess the company's short-term liquidity and its ability to meet short term obligations with its short-term assets. Zeb *et al.* (2016) investigated the impact of liquidity and capital structure on the financial performance of Cement sector firm. The study showed that quick ratio and current ratio have significant positive impact on the financial performance of these cement sector firms. Similarly, Lusy *et al.* (2018) examined the effects of current ratio and debt-to-equity ratio on return on asset and return on equity for companies of the food and noodle sub-sector. The results of the study showed that current ratio and debt-to-equity ratio have significant impact on return on asset and return on equity. Likewise, Amanda (2019) analyzed the impact of cash turnover, receivable turnover, inventory turnover, current ratio and debt to equity ratio to profitability. The study revealed that current ratio has a positive and significant impact on profitability. Further, Marjohan (2020) determined the effect on profitability and its impact on the firm value of the manufacturing industry listed on the Indonesia Stock Exchange. The study showed that current ratio has a significant influence on return on assets. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between current ratio and profitability of banks.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2012/13 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 11 Nepalese commercial banks for the study period from 2012/13 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CRR (Cash reserve ratio as measured by the percentage of money kept in central bank, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), CR (Current ratio as measured by the ratio of current assets to current liabilities, in percentage), and CDR (Cash to deposit ratio as measured by the ratio of total cash to total deposits, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.55	3.22	1.631	0.501
ROE	6.26	26.96	12.557	6.129
CAR	10.49	23.31	13.847	3.175
NPL	0.01	5.82	1.595	1.411
LDR	55.18	88.78	74.848	6.762
CRR	0.03	0.06	0.048	0.012
CDR	0.01	0.51	0.069	0.072
CR	0.03	12.07	1.332	1.156

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 11 Nepalese commercial banks for the study period from 2012/13 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CRR (Cash reserve ratio as measured by the percentage of money keep in central bank, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), CR (Current ratio as measured by the ratio of current assets to current liabilities, in percentage), and CDR (Cash to deposit ratio as measured by the ratio of total cash to total deposits, in percentage).

Variables	ROA	ROE	CAR	NPL	LDR	CRR	CDR	CR
ROA	1							
ROE	0.162	1						
CAR	0.339**	0.247**	1					
NPL	-0.087	-0.116	-0.236**	1				
LDR	-0.138	-0.073	0.254**	-0.401**	1			
CRR	-0.394**	-0.029	-0.151	0.131	-0.401**	1		
CDR	0.072	0.002	0.330**	0.120	0.131	-0.186*	1	
CR	-0.212*	-0.026	-0.033	0.095	0.120	-0.156	0.047	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 3 shows that capital adequacy ratio has a positive relationship with return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. However, there is a negative relationship between non-performing loan and return on assets. It indicates that increase in non-performing loan leads to decrease in return on assets. Likewise, loan to deposit ratio has a negative relationship with return on assets. It indicates that higher the loan to deposit ratio, lower would be the return on assets. Further, there is a negative relationship between cash reserve ratio and return on assets. It indicates that increase in cash reserve ratio leads to decrease in return on assets. In contrast, cash to deposit ratio has a positive relationship with return on assets. It indicates that increase in cash to deposit ratio leads to increase in return on assets. However, there is a negative relationship between current ratio and return on assets. It indicates that increase in current ratio leads to decrease in the return on assets.

Likewise, the result also shows that capital adequacy ratio has a positive relationship with return on equity. It indicates that increase in capital adequacy ratio leads to increase in return on equity. However, there is a negative relationship between non-performing loan and return on equity. It indicates that increase in non-performing loan leads to decrease in return on equity. Likewise, loan to deposit ratio has a negative relationship with return on equity. It indicates that higher the loan to deposit ratio, lower would be the return on equity. Further, there is a negative relationship between cash reserve ratio and return on equity. It indicates that increase in cash reserve ratio leads to decrease in return on equity. In contrast, cash to deposit ratio has a positive relationship with return on equity. It indicates that increase in cash to deposit ratio leads to increase in return on equity. However, there is a negative relationship between current ratio and return on equity. It indicates that increase in current ratio leads to decrease in the return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been

carried out and results are presented in Table 4. More specifically, it shows the regression results of capital adequacy ratio, non-performing loan, loan to deposit ratio, cash to deposit ratio, cash reserve ratio and current ratio with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, non-performing loan, loan to deposit ratio, cash reserve ratio, cash to deposit ratio and current ratio on return on assets

The results are based on panel data of 11 commercial banks with 121 observations for the period of 2012/13 to 2022/23 by using linear regression model. The model is $ROA_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 CRR_{it} + \beta_4 LDR_{it} + \beta_5 CR_{it} + \beta_6 CDR_{it} + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CRR (Cash reserve ratio as measured by the percentage of money keep in central bank, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), CR (Current ratio as measured by the ratio of current assets to current liabilities, in percentage), and CDR (Cash to deposit ratio as measured by the ratio of total cash to total deposits, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		CAR	NPL	LDR	CRR	CDR	CR			
1	0.891 (4.616)**	0.530 (3.927)**						0.107	0.4728	15.421
2	1.581 (22.962)**		-0.031 (0.956)					0.001	0.506	0.913
3	2.395 (4.742)**			-0.100 (1.519)				0.011	0.497	2.307
4	0.819 (4.590)**				-17.008 (4.680)**			0.148	0.461	21.900
5	1.596 (25.173)**					0.499 (0.782)		0.003	0.501	0.612
6	1.753 (25.664)**						-(0.092) (2.361)**	0.037	0.491	5.573
7	0.700 (3.289)**	0.060 (4.341)**	-0.063 (2.019)*					0.130	0.466	9.949
8	1.782 (3.336)**	0.066 (4.741)**	-0.039 (1.197)	-0.015 (2.202)*				0.157	0.459	8.465
9	0.280 (0.456)	0.070 (5.655)**	-0.056 (1.911)	-0.001 (0.146)	-19.242 (5.387)**			0.320	0.412	15.124
10	0.301 (0.487)	0.068 (5.250)**	-0.058 (1.952)	-0.001 (0.122)	-19.524 (5.388)**	0.297 (0.523)		0.316	0.413	12.078
11	0.276 (0.452)	0.067 (5.167)**	-0.064 (2.161)*	-0.001 (0.084)	-18.817 (5.223)**	0.351 (0.625)	-0.063 (1.892)	0.331	0.409	10.887

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for capital adequacy ratio are positive with return on assets. It indicates that capital adequacy has a positive impact on return on assets. This finding is consistent with the findings of Handayani *et al.* (2019). However, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is consistent with the findings of Kadioglu and Ocal (2017). Likewise, the beta coefficients for loan to deposit ratio are negative with return on assets. It indicates that loan to deposit ratio has a negative impact on return on assets. This finding is consistent with the findings of Yigermal (2017). Further, the beta coefficients for cash reserve ratio are negative with return on assets. It indicates that cash reserve ratio has a negative impact on return on assets. This finding is inconsistent with the findings of Oganda *et al.* (2018). In contrast, the beta coefficients for cash to deposit ratio are positive with return on assets. It indicates that cash to deposit ratio has a positive impact on return on assets. This finding is not consistent with the findings of Shaibu & Okafor (2020).

However, the beta coefficients for current ratio are negative with return on assets. It indicates that current ratio has a negative impact on return on assets. This finding is inconsistent with the findings of Lusy *et al.* (2018).

Table 5

Estimated regression results of capital adequacy ratio, non-performing loan, loan to deposit ratio, cash reserve ratio, cash to deposit ratio and current ratio with return on equity

The results are based on panel data of 11 commercial banks with 121 observations for the period of 2012/13 to 2022/23 by using linear regression model. The model is $ROE_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 CRR_{it} + \beta_4 LDR_{it} + \beta_5 CR_{it} + \beta_6 CDR_{it} + e_{it}$ where, the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CRR (Cash reserve ratio as measured by the percentage of money keep in central bank, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), CR (Current ratio as measured by the ratio of current assets to current liabilities, in percentage), and CDR (Cash to deposit ratio as measured by the ratio of total cash to total deposits, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		CAR	NPL	LDR	CRR	CDR	CR			
1	24.966 (1.736)	2.818 (2.782)**						0.053	35.221	7.742
2	18.804 (3.7856)**		-2.977 (1.274)					0.005	36.103	1.624
3	15.171 (0.412)			0.390 (0.798)				0.003	36.252	0.637
4	9.716 (0.693)				90.700 (0.317)			0.008	36.333	0.101
5	13.98 (3.040)**					1.089 (0.024)		0.008	36.349	0.001
6	13.615 (3.856)**						0.055 (0.352)	0.007	36.330	0.124
7	20.186 (1.254)	2.654 (2.540)**	-1.569 (0.668)					0.049	35.303	4.076
8	0.016 (0.388)	2.675 (2.507)**	-1.662 (0.663)	0.021 (0.011)				0.041	35.452	2.698
9	42.101 (0.797)	2.737 (2.554)**	-1.444 (0.572)	0.119 (0.209)	43.558 (0.792)			0.038	35.509	2.174
10	38.981 (0.736)	3.028 (2.704)**	-1.703 (0.670)	0.097 (0.169)	21.730 (0.649)	44.136 (0.906)		0.036	35.536	1.901
11	37.191 (0.698)	3.152 (2.723)**	-1.931 (0.742)	0.051 (0.087)	27.139 (0.663)	33.528 (0.616)	0.084 (0.445)	0.028	35.692	1.570

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on equity is the dependent variable.

Table 5 shows that the beta coefficients for capital adequacy ratio are positive with return on equity. It indicates that capital adequacy has a positive impact on return on equity. This finding is consistent with the findings of Olalekan and Adeyinka (2013). However, the beta coefficients for non-performing loan are negative with return on equity. It indicates that non-performing loan has a negative impact on return on equity. This finding is consistent with the findings of Islam and Rana (2017). Likewise, the beta coefficients for loan to deposit ratio are negative with return on equity. It indicates that loan to deposit ratio has a negative impact on return on equity. This finding is consistent with the findings of Mohanty and Krishnankutty (2018). Further, the beta coefficients for cash reserve ratio are negative with return on equity. It indicates that cash reserve ratio has a negative impact on return on equity. This finding is inconsistent with the findings of Oganda *et al.* (2018). In contrast, the beta coefficients for cash to deposit ratio are positive with return on equity. It indicates that cash to deposit ratio has a positive impact on return on equity. This finding is not consistent with the findings of Shaibu

& Okafor (2020). However, the beta coefficients for current ratio are negative with return on equity. It indicates that current ratio has a negative impact on return on equity. This finding is inconsistent with the findings of Marjohan (2020).

4. Summary and conclusion

Risk management practices would have an effect on profitability of listed commercial banks in Nepal. From the analysis, the overall outcome reveals that the practices on risk management should be enhanced since the influence positively the returns that banks make in any given period. This study demonstrates the importance of the risk management in influencing the income statement of the commercial banks in Nepal, thus it can be concluded that managers who ought to increase the earning of their company should keep an eye on the item that are likely to alter the liquidity of their firms. More importantly, the loan proportion given by banks need to be maintained at a manageable level so as to boost the profitability in cases of short falls.

This study attempts to analyze the impact of risk management on the profitability of Nepalese commercial banks. The study is based on secondary data of 11 commercial banks with 121 observations for the period from 2012/13 to 2022/23.

The major conclusion of this study is that non-performing loans, loan-to-deposit ratio, cash reserve ratio and current ratio have negative impact on return on assets and return on equity. It indicates that higher the non-performing loans, loan-to-deposit ratio, cash reserve ratio and current ratio, lower would be the return on assets and return on equity. However, capital adequacy ratio and cash to deposit ratio have positive impact on return on assets and return on equity. It indicates that higher the capital adequacy ratio and cash to deposit ratio, higher would be the return on assets and return on equity. Likewise, the study also concluded that cash reserve ratio followed by capital adequacy ratio is the most influencing factor that explains the changes in the return on assets in the context of Nepalese commercial banks. Similarly, the study also concluded that capital adequacy ratio followed by non-performing loan is the most influencing factor that explains the changes in the return on equity in the context of Nepalese commercial banks.

References

- Abidi, F. S., & S. Lodhi, 2015. Impact of changes in reserve requirement on banks profitability: A case of commercial banks in Pakistan. *Impact Factor, Case Studies Journal* ISSN 4(11), 12-24.
- Adhikari, K., K. Mainanli, and M. Kargbo, 2020. Impacts of bank capital, liquidity, and credit risk performance on Nepalese commercial banks. *Nepalese Journal of Finance* 7(3), 143-156.
- Agustiningrum, R., 2013. Analysis of non-performing loans and loan to deposit ratio towards performance. *International Journal of Multicultural and Multireligious Understanding* 8(1), 423-436.
- Ahmad, F., and T. Bashir, 2013. Explanatory power of bank specific variables as determinants of non-performing loans: Evidence from Pakistan banking sector. *World Applied Sciences Journal* 22(9), 1220-1231.
- Ahmad, S., N. Bilal, and K. Z. Ahmad, 2012. Determinants of performance of Pakistani banks: panel data evidence for the period 2001-2010. *Journal of Business Studies Quarterly* 4(1), 149-165.
- Ahmed, S., M. E. Majeed, E. Thalassinis, and Y. Thalassinis, 2021. The impact of bank specific and macro-economic factors on non-performing loans in the banking sector: evidence from an emerging economy. *Journal of Risk and Financial Management* 14(5), 217-231.
- Akber S. M. & A. Dey, 2020. Influence of liquidity on profitability of commercial banks in Bangladesh. Dhaka: Bangladesh. *Study Journal of Finance and Accounting* 11(14), 87-93.

- Alexandri, M. B., and T. I. Santoso, 2015. Impacts of internal and external factor: An evidence from Indonesia. *International Journal of Humanities and Social Science Invention* 4(1), 87-91.
- Amanda, R. I., 2019. The impact of cash turnover, receivable turnover, inventory turnover, current ratio, and debt to equity ratio on profitability. *Journal of Study in Management* 2(2), 14-22.
- Amenawo, I., H. B. Riman, and E. S. Akpan, 2016. Foreign exchange fluctuations and commercial banks the financial performance in Nigeria. *Foreign Exchange* 7(18), 1-7.
- Ariffin, A. F., and F. H. Tafri, 2014. The impact of financial risks on Islamic banks' the financial performance. *International Conference on Business, Sociology and Applied Sciences* 4(1), 97-102.
- Athanasoglou, P., M., Delis, and C. Staikouras, 2006. Determinants of financial performance in the South Eastern European region. *Munich Personal RePEc Archive* 1(1), 1-31.
- Bagh, T., S. Razzaq, T. Azad, I. Liaqat, & M. A. Khan, 2017. The causative impact of liquidity management on profitability of banks in Pakistan: An empirical investigation. *International Journal of Academic Study in Economics and Management Sciences* 6(3), 153-170.
- Brastama, R. F., and I. P. Yadnya, 2020. The effect of capital adequacy ratio and non-performing loan on banking stock prices with performance as intervening variable. *American Journal of Humanities and Social Sciences Research* 4(12), 43-49.
- Budhathoki, P. B., K. C. Rai, P. K. Lamichhane, G. Bhattarai, and A. Rai, 2020. The impacts of liquidity, leverage, and total size on banks' performance: Evidence from Nepalese commercial banks. *Journal of Economics and Business* 3(2), 123-135.
- Chalise, S., 2019. The impacts of capital adequacy ratio and cost income ratio on the performance of Nepalese commercial banks. *International Journal of Economics and Management* 6(7), 78-83.
- Dodi, D., D. Supiyadi, M. Arief, and N. Nugraha, 2018. Islamic Bank The financial performance: A study of Islamic bank in Indonesia. *The International Journal of Business Review* 1(1), 51-62.
- Farhan, M., A. Sattar, C. A. Hussain, and F. Khalif, 2012. Economic determinants of non-performing loans: Perception of Pakistani bankers European. *Journal of Business and Management* 14(9), 22-32.
- Farkasdi, S., B. Septiawan, and E. S. Alghifari, 2021. Determinants of commercial banks the financial performance: Evidence from Germany. *Jurnal Riset Akuntansi Kontemporer* 13(2), 82-88.
- Gnawali, A., 2018. Non-performing asset and its effects on performance of Nepalese commercial banks. *Journal of Research in Business Studies and Management* 5(9), 39-47.
- Golubeva, O., M. Duljic, and R. Keminen, 2019. The impact of liquidity risk on bank the financial performance: Some empirical evidence from the European banks following the introduction of Basel III regulations. *Journal of Accounting and Management Information Systems* 18(4), 455-485.
- Hadian, N., 2021. The effect of non-performing loans and loan to deposit ratio on return on assets in the banking industry. *Turkish Journal of Computer and Mathematics Education* 12(8), 791-798.
- Handayani, E., and N. T. A. Fitriati, 2019. The determinants of Islamic commercial bank the financial performance in Indonesia during 2012-2018. *The International Journal of Business Management and Technology* 3(5), 225-236.
- Hassan, S. R., and R. Ahmed, 2019. Internal determinants of Islamic bank the financial performance: Evidence from Bangladesh. *International Journal of Economics and Financial Research* 5(7), 171-176.
- Hoque, A., A. Ahmad, M. Chowdhury, & M. Shahidullah, 2020. Impact of monetary policy on bank's profitability: A study on listed commercial banks in Bangladesh. *International Journal of Accounting & Finance Review* 5(2), 72-79.
- Hussain, H. and G. A. Bhatti, 2010. Evidence on structure conduct performance hypothesis in Pakistani commercial

- banks. *International Journal of Business and Management* 5(9), 174-187.
- Islam, M. A., and R. H. Rana, 2017. Determinants of financial performance for the selected private commercial banks in Bangladesh: A panel data analysis. *Journal of Finance* 12(3), 179-192.
- Kadioglu, E., and N. Ocal, 2017. Effect of the asset quality on the financial performance. *International Journal of Economics and Finance* 9(7), 60-68.
- Khatri, P., 2020. Impacts of liquidity on performance of Nepalese commercial banks. *Journal of Economics and Finance* 11(6), 26-33.
- Lawati, L., 2021. The effect of loan to deposit ratio and debt to equity ratio on return on equity. *Journal of Management and Business* 5(1), 101-107.
- Liyana, L., and E. Indrayani, 2020. The effect of non-performing loans (NPL), loan-to-deposit ratio (LDR) and net interest margin (NIM) on the financial performance (ROA) with CAR as intervening variables on go public commercial banks in Indonesia and listed on BEI period 2014. *Asian Journal of Social Science and Management Technology* 2(2), 61-75.
- Lusy, L., Y. B. Hermanto, T. W. S. Panjaitan, & M. Widyastuti, 2018. Effects of current ratio and debt-to-equity ratio on return on asset and return on equity. *International Journal of Business and Management Invention* 7(12), 31-39.
- Marjohan, M., 2020. The effect analysis of liquidity, solvency on profitability, and its impact to the company value at PT KS, Tbk. *Journal BIRCI* 3(4), 3845-3860.
- Mohanty, B. K., and R. Krishnankutty, 2018. Determinants of the financial performance in Indian banks in the changing scenario. *International Journal of Economics and Financial Issues* 8(3), 235-240.
- Mohanty, B., & S. Mehrotra, 2018. The effect of liquidity management on profitability: a comparative analysis of public and private sector banks in India. *IUP Journal of Bank Management* 17(1), 7-20.
- Nahar, F. H., C. Faza, and M. Azizurrohman, 2020. Macroeconomic analysis and financial ratios on Sharia commercial bank the financial performance: A case study of Indonesia. *Journal of Islamic Economics, Finance, and Banking* 3(1), 37-50.
- Neupane, B. P., 2020. Performance determinants of Nepalese commercial banks. *Press Academia Procedia* 12(5), 40-45.
- Nuhiu, A., A. Hoti, and M. Bektashi, 2017. Determinants of commercial banks the financial performance through analysis of the financial performance indicators: Evidence from Kosovo. *Business Theory and Practice* 18(1), 160-170.
- Oganda, A. J., V. A. Mogwambo, & S. Otieno, 2018. Effect of cash reserve on performance of commercial banks in Kenya: A comparative study between national bank and equity bank Kenya limited. *International Journal of Academic Study in Business and Social Sciences* 8(9), 685-704.
- Ogunbiyi, S. S., 2014. Interest rates and deposit money banks the financial performance nexus: The Nigerian experience. *Arabian Journal of Business and Management Review* 3(11), 133-149.
- Olagunju, I. L., & N. A. Isiaka, 2021. The economic implication of cash reserve requirement on the profitability of deposit money banks in Nigeria. *Cross-Cultural Communication* 17(1), 38-47.
- Olalekan, A., and S. Adeyinka, 2013. Capital adequacy and banks' the financial performance: Empirical evidence from Nigeria. *American International Journal of Contemporary Research* 3(10), 87-93.
- Rajindra, R., G. Guasmin, B. Burhanuddin, and R. N. Anggraeni, 2021. Costs and operational revenue, loan to deposit ratio against return on assets: A case study in Indonesia. *The Journal of Asian Finance, Economics and Business* 8(5), 109-115.
- Ramadhanti, C., M. Marlina, and S. Hidayati, 2019. The effect capital adequacy, liquidity and credit risk to

- performance of commercial banks. *Journal of Economics, Business, and Government Challenges* 2(1), 71-78.
- Safitri, K. Y. D., I. M. Mertha, N. G. P. Wirawati, and A. A. Dewi, 2020. The impacts of debt to equity ratio, price earnings ratio, earning per share to the stock price on banking sectors listed in infobank15 Index 2014-2018. *American Journal of Humanities and Social Sciences Research* 4(5), 49-56.
- Sawitri, N. N., 2018. The prediction of third party funds, interest rates, and non-performing loans toward loan-to-deposit ratios and its impact on return on assets on commercial banks in Indonesia. *Journal of Management* 22(3), 409-420.
- Sayani, H., P. Kishore, and V. Kumar, 2017. Internal determinants of return on equity: Case of the UAE commercial banks. *Banking and Finance Review* 9(1), 47-74.
- Setiawan, Y., and M. Nupus, 2021. The effect of capital adequacy ratio and loan to deposit ratio on banking performance. *International Journal of Business and Management* 1(1), 79-89.
- Shafiq, A., and M. Nasr, 2010. Risk management practices followed by the commercial banks in Pakistan. *International Review of Business Research Papers* 6(2), 308-325.
- Shaibu, I., & C. Okafor, 2020. A statistical assessment of liquidity management and profitability in a cross section of deposit money banks in Nigeria using Panel Analysis. *Archives of Business Study* 8(3), 173-190.
- Singh, S. K., B. Basuki, and R. Setiawan, 2021. The effect of non-performing loan on performance: Empirical evidence from Nepalese commercial banks. *The Journal of Asian Finance, Economics and Business* 8(4), 709-716.
- Solihati, G. P., 2020. Analysis of factors affecting banking performance. *International Journal of Management Studies and Social Science Research* 2(6), 36-48.
- Steven, S., and N. Toni, 2020. The effect of bank capacity and loan-to-deposit ratio on the financial performance and credit risk. *International Journal of Multicultural and Multireligious Understanding* 7(11), 1-9.
- Sufian, F., and M. S. Habibullah, 2009. Bank specific and macroeconomic determinants of bank the financial performance: Empirical evidence from the China banking sector. *Frontiers of Economics in China* 4(2), 274-291.
- Sukmadewi, R., 2020. The effect of capital adequacy ratio, loan to deposit ratio, operating-income ratio, non-performing loans, net interest margin on banking financial performance. *ECO-Buss* 2(2), 1-10.
- Sunaryo, D., 2020. The effect of capital adequacy ratio (CAR), net interest margin (NIM), non-performing loans (NPL), and loan-to-deposit ratio (LDR) against return on asset (ROA) in general banks in Southeast Asia. *Ilomata International Journal of Management* 1(4), 149-158.
- Suyono, C., S. Teddy, and J. Irawati, 2017. Analisis Faktor yang Mempengaruhi Profitabilitas Perbankan (Studi Bank Umum di Indonesia Period 2006-2010). *Procuratio* 5(2), 262-275.
- Utu, L., 2019. Analysis on non-performing loan, net interest margin, and loan to deposit ratio as well as their effects on return on asset in bank Sultra. *International Journal of Civil Engineering and Technology* 10(09), 313-324.
- Yigermal, M. E., 2017. The determinants of private commercial banks the financial performance: In the case of selected Ethiopian private banks. *International Journal of Economic Behavior and Organization* 5(1), 25-35.
- Zeb, A., S. Khan, & M. Iqbal, 2016. Effect of liquidity and capital structure on financial performance: Evidence from banking sector. *Developing Country Studies* 6(7), 1-9.

Chapter 23

Impact of credit risk, liquidity, loan loss provision, size and beta on the profitability of Nepalese commercial banks

- Manisha Kumari Karki*

Abstract

This study examines the impact of credit risk, liquidity, loan loss provision, size and beta on the profitability of Nepalese commercial banks. Return on assets and return on equity are the selected dependent variables. The selected independent variables are capital adequacy ratios, non-performing loans, loan-to-deposit ratios, loan loss provisions, bank size, and market risk. The study is based on secondary data of 15 commercial banks with 120 observations for the study period from 2015/16 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of credit risk, liquidity, loan loss provision, size and beta on the profitability of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive impact return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. However, capital adequacy ratio has a negative impact on return on equity. It indicates that increase in capital adequacy ratio leads to decrease in return on equity. In contrast, bank size has a positive impact on return on assets and return on equity. It indicates that larger the bank size, higher would be the return on assets and return on equity. However, non-performing loan has a negative impact on return on assets and return on equity. It indicates that higher the non-performing loan, lower would be the return on assets and return on equity. Similarly, loan to deposit ratio has a negative impact on return on assets and return on equity. It indicates that higher the loan to deposit ratio, lower would be the return on assets and return on equity. Likewise, loan loss provision has a negative impact on return on assets and return on equity. It indicates that higher the loan loss provision, lower would be the return on assets and return on equity. Further, market risk has a negative impact on return on assets and return on equity. It indicates that higher the market risk, lower would be the return on assets and return on equity.

Keywords: capital adequacy ratios, non-performing loans, loan-to-deposit ratios, loan loss provisions, bank size, market risk, return on assets, return on equity

1. Introduction

Banks plays crucial role as a financial intermediaries and also considered very important for economies functions. The economic growth can also affect financial intermediation efficiency. Banking sector is treated as the leading driving force of an economy (Swandewi and Purnawati, 2021). Poor bank performance will lead to failure and lead to financial crises that will have negative consequences for economic development (Nuhui *et al.*, 2017). Profit is one of the main goals of the banking industry. Profitability is the companies' ability to earn profits or a measure of the effectiveness of company management. A high level of profitability can indicate that the bank is working efficiently. A high level of profitability can also illustrate that the productivity of the bank is getting better, and can show the development of the bank itself. Therefore, profitability is very important both for the bank itself and for the customers and prospective customers of the bank (Suyono *et al.*, 2017). Commercial banks play a crucial and dynamic role in the economic development of a country. An efficient, effective, and disciplined banking system fosters fast growth across multiple sectors within a country. Different factors may influence the profitability of commercial banks. Essentially, it may be classified into internal and external aspects of the bank. Internal or particular elements of a bank include capital sufficiency, liquidity, operational expenditures, asset quality, management efficiency, and bank size, among others.

The escalating phenomena of globalization has rendered the notion of efficiency increasingly

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significant for both non-financial and financial entities, with banks being included among them. Banks mostly rely on competitive marketing strategies that dictate their success and growth. Variables influencing organizations' performance are categorized as either macro or micro variables, and they significantly affect performance outcomes. Macro factors are external elements outside the company's control, whereas micro factors are those under the company's control. According to Dawood (2014), the banking sector is like the backbone of an economy because of the crucial function it plays in providing finance and supporting economic activity. In addition to being vital to the functioning of economies, banks provide an essential duty as financial intermediaries. The effectiveness of financial intermediation can be influenced by economic development as well. Furthermore, the entire crisis might be triggered by bank insolvencies (Masood and Ashraf, 2012). The economy is better equipped to withstand negative macroeconomic shocks when the banking sector is robust and profitable (Tafri *et al.*, 2010). There would be no economy without the banking sector, which is crucial to a nation's progress. A nation needs a solid financial system if it wants to keep growing economically (Onuogha, 2014). By encouraging capital accumulation through the provision of credit, an effective banking sector favorably impacts economic development.

Financial institutions play an important role in a country's economy by lending money to businesses and individuals, facilitating savings and investment, facilitating trade, and reducing exposure to risk (Levine, 1998). Changes in macroeconomic conditions may positively or negatively impact a company's financial success. Likewise, any alterations in micro variables would similarly impact enterprises within the same industry, either positively or adversely. The profitability of banks diminishes as the debt-to-equity ratio escalates, likely because equity is less costly than debt. Hence, an increased leverage ratio tends to impair bank performance. An underperforming economy results in individuals becoming deeply entrenched in debt and defaulting, which can precipitate bank failures, as credit is a critical element of banks' financial stability. Consequently, efficient supervision of non-performing loans is essential to enhance bank performance and provide insights on economic efficiency. The profitability of banks is jeopardized by the increase in non-performing loans, attributed to a lack of risk management (Haneef *et al.*, 2012).

Christaria and Kurnia (2016) examined the influence of capital adequacy ratio, loan to deposit ratio, and non-performing loan on bank profitability. The study revealed that non-performing loans and the loan-to-deposit ratio have significantly negative influence on bank profitability. Likewise, Islam and Rana (2017) assessed the determinants of bank profitability for the selected private commercial banks in Bangladesh: A panel data analysis. The study revealed a significant negative relationship between non-performing loan and profitability of banks in Bangladesh as measured by return on equity. Further, better performance of financial institutions plays a significant role in the economic development of a country. The loan is one of the major components of the earning assets of a commercial bank. However, increase in non-performing loan leads to decrease in bank performance and efficiency (Farhan *et al.*, 2024). In addition, Golubeva *et al.* (2019) analyzed the impact of liquidity risk on bank profitability: some empirical evidence from the European banks following the introduction of Basel III regulations. The study showed that credit to deposit ratio has a negative relationship with return on equity. Moreover, Mohanty and Krishnankutty (2018) examined the determinants of profitability in Indian banks in the changing scenario. The study concluded that credit to deposit ratio has a negative and significant relationship with return on asset. However, Steven and Toni (2020) found that credit to deposit ratio has a positive relationship with profitability. Likewise, Pelealu and Worang (2017) found that loan loss provision has a negative and insignificant impact on bank profitability.

Shittu and Abdulkadir (2023) examined the moderating effect of cost per loan asset ratio on the relationship between credit risk and financial performance of listed deposit money banks in Nigeria.

The study found a substantial positive correlation between non-performing loans and return on assets. Likewise, Nuhiu *et al.* (2017) examined the determinants of commercial banks profitability through analysis of financial performance indicators: Evidence from Kosovo. The study indicated a significant correlation of non-performing loans and capital adequacy ratio with financial success. Operational efficiency (OEOI) exerts a positive and significant influence on bank profitability as measured by return on assets. The size of a bank has a substantial and positive impact on the profitability of banking enterprises listed on the Indonesia Stock Exchange (Anggari and Danas, 2020). In addition, Irawati *et al.* (2019) investigated the financial performance of Indonesian's banking industry: the role of good corporate governance, capital adequacy ratio, non-performing loan and size. The study found that firm size significantly and positively influences profitability measured by return on assets. Aladwan (2015) analyzed the impact of bank size on profitability: An empirical study on listed Jordanian commercial banks. The study stated a robust positive link between bank size and profitability.

Lardic and Terraza (2019) revealed that there is a positive and significant relationship between profitability and medium sized banks. Similarly, Smirlock (1985) concluded that size is positively related to bank profitability. Likewise, Gulet *et al.* (2011) found a direct relationship between bank size and profitability. Further, Goddard *et al.* (2004) revealed that bank size is positively correlated to bank profitability. In addition, Alfadli and Rjoub (2020) investigated the impacts of bank-specific, industry-specific and macroeconomic variables on commercial bank financial performance. The study found that bank size has a positive and significant relationship with return on assets and return on equity. Moreover, Domanovic *et al.* (2018) showed a positive relationship between bank size and Serbian bank profitability. Similarly, Lohano and Kashif (2019) concluded that bank size is positively correlated to return on assets and return on equity. Likewise, Bogale (2019) found that bank size is significant and positively related with profitability of Ethiopian private commercial banks. Further, San and Heng (2013) revealed a positive relationship between bank size and profitability as measured by return on equity. In addition, Kassem and Sakr (2018) investigated the relationship between bank-specific factors and the profitability of banks in Egypt. The study showed a positive relationship between bank size and profitability measured by return on assets and return on equity. Moreover, Sahyouni and Wang (2018) found that bank size is positively correlated to profitability of banks. However, Akbas (2012) concluded that bank size is negatively correlated to profitability measured by return on assets and return on equity.

In the context of Nepal, Poudel (2018) investigated the impact of credit risk on profitability of the commercial banks in Nepal. The study found that there is a negative relationship between credit risk and profitability of the banks. Similarly, Tharu and Shrestha (2019) examined the impact of bank size on the profitability of commercial banks in Nepal. The study indicated that bank's profitability (ROA) has not been substantially affected by its size (Assets). Further, Gautam (2018) analyzed the factors influencing the financial performance of commercial banks in Nepal. The study demonstrated a positive correlation between return on assets and capital adequacy ratio. In addition, Chaudhary *et al.* (2017) examined the influence of corporate governance on organizational performance. The study demonstrated that board size, frequency of board meetings, and business size have positive impact on firm performance. Moreover, Singh *et al.* (2021) analyzed the effect of non-performing loan (NPL) of Nepalese conventional banks. The result of the study showed that return on assets, bank size, and inflation have significant impact on non-performing loan but capital adequacy ratio does not have a significant impact on non-performing loan of the banks. Likewise, Gurung and Gurung (2022) revealed that loan to deposit, known as credit deposit ratio, has a significant positive impact on the return on assets and net interest margin of commercial banks.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of credit risk, liquidity, loan loss provision, size and beta on the profitability of commercial

banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of credit risk, liquidity, loan loss provision, size and beta on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratios, non-performing loans, loan-to-deposit ratios, loan loss provisions, bank size, and market risk with profitability of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 15 Nepalese commercial banks from 2015/16 to 2022/23, leading to a total of 120 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

TABLE 1

List of commercial banks selected for the study along with the study period and number of observations

S. N.	Name of the banks	Study period	Observations
Public Banks			
1	Nepal Bank Limited	2015/16-2022/23	8
2	RastriyaBanijsya Bank Limited	2015/16-2022/23	8
3	Agricultural Development Bank Limited	2015/16-2022/23	8
Joint Venture Banks			
4	Nabil Bank Limited	2015/16-2022/23	8
5	NMB Bank Limited	2015/16-2022/23	8
6	Nepal SBI Bank Limited	2015/16-2022/23	8
7	Standard Chartered Bank Nepal Limited	2015/16-2022/23	8
8	Himalayan Bank Limited	2015/16-2022/23	8
9	Everest Bank Limited		
Private Banks			
10	Citizen Bank International Limited	2015/16-2022/23	8
11	Siddhartha Bank Limited	2015/16-2022/23	8
12	NIC Asia Bank Limited	2015/16-2022/23	8
13	Prime Commercial Bank Limited	2015/16-2022/23	8
14	Sanima Bank Limited	2015/16-2022/23	8
15	Machhapuchchhre Bank Limited	2015/16-2022/23	8
Total number of observations			120

Thus, the study is based on 120 observations.

The model

The model used in this study assumes that banks' profitability depends upon credit risk, liquidity, loan loss provision, size and beta. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are capital adequacy ratios, non-performing loans, loan-to-deposit ratios, loan loss provisions, bank size, and market risk. Therefore, the models take the following forms:

$$ROA_{it} = \beta_0 + \beta_1 LDR + \beta_2 MR + \beta_3 CAR + \beta_4 NPL + \beta_5 LLP + \beta_6 BS + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 LDR + \beta_2 MR + \beta_3 CAR + \beta_4 NPL + \beta_5 LLP + \beta_6 BS + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

LDR = Loan- to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

MR= Market risk as measured by the ratio of risk-weighted exposure for market risk to overall risk exposure, in percentage.

NPL = Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage.

CAR= Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage.

LLP= Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage.

BSIZE = Bank size as measured by total assets, Rs. in billion.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Capital adequacy ratio

The capital adequacy ratio is calculated by dividing the total of primary and supplemental capital by risk-weighted assets (%). Kumar *et al.* (2020) examined the correlation between monetary policy and bank profitability in New Zealand. The study indicated a positive correlation between capital adequacy ratio and return on assets. Similarly, Almumani (2013) stated a positive correlation between capital adequacy ratio and the profitability of Jordanian banks. Likewise, Ariwidanta and Wiksuana (2018) revealed that capital adequacy ratio is positively correlated to return on assets. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between capital adequacy ratio and banks' profitability.

Non-performing loan

A non-performing loan (NPL) is defined as a loan for which the borrower has ceased making payments on both the principle and interest (Singh *et al.*, 2021). A non-performing loan is quantified as the ratio of non-performing loans to total loans. The severity of a credit crisis is typically exacerbated by the ratio of a bank's non-performing loans (Alexandri and Santoso, 2015). Kadioglu and Ocal (2017) examined the impact of non-performing loans on bank profitability in Turkey. The

study revealed that non-performing loan has a negative relationship with return on assets and return on equity. Similarly, Islam and Rana (2017) showed a negative correlation between non-performing loans and the profitability of banks in Bangladesh. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between non-performing loan and banks' profitability.

Loan-to-deposit ratio

The loan-to-deposit ratio is calculated as the proportion of total loans issued by banks relative to the deposits received. Mehta and Bhavani (2017) analyzed the factors influencing the profitability of banks in the UAE. The study indicated that credit-to-deposit ratio has an inverse relationship with return on assets and return on equity. Similarly, Chowdhury and Zaman (2018) revealed that credit to deposit ratio has an inverse relationship with return on assets and return on equity. Likewise, Purbaningsih and Fatimah (2014) revealed that loan to deposit ratio has an inverse relationship with return on assets. Further, Suroso (2022) stated that loan-to-deposit ratio adversely impacts profitability. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between loan-to-deposit ratio and banks' profitability.

Loan loss provision

The loan loss provision signifies a bank's ability to manage prospective loan losses. Alhadab and Alsahawneh (2016) revealed that loan loss provisions has a negative impact on profitability of Jordanian commercial banks. Similarly, Iloska (2014) concluded that operational expenditures and loan-loss provisions have an inverse correlation with bank profitability. Likewise, Pelealu and Worang (2017) revealed that loan loss provisions has a negative impact on banks' profitability. Loan loss provisions serve as a buffer to accommodate anticipated losses arising from defaulted installment payments within a bank's loan portfolio; they are also referred to as provisions for bad debts (Ozili and Outa, 2017). Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between loan loss provisions and banks' profitability.

Bank size

The size of a bank is quantified as the natural logarithm of its total assets (Riaz and Mehar, 2013). Similarly, Hernandez *et al.* (2019) showed a positive correlation between bank size and profitability. Likewise, Lardic and Terraza (2019) found a positive correlation between profitability and medium-sized banks. Further, Alfadli and Rjoub (2020) examined the effects of bank-specific, industry-specific, and macroeconomic factors on the financial performance of commercial banks. The study revealed a positive correlation between bank size and profitability measured by return on assets and return on equity. In addition, Domanovic *et al.* (2018) revealed a positive correlation between bank size and profitability of Serbian banks. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between bank size and banks' profitability.

Market risk

Market risk refers to the potential for financial loss in the Bank's on and off balance sheet positions resulting from fluctuations in asset values, interest rates, foreign exchange rates, market volatility, and liquidity conditions. Similarly, Sondakh (2021) showed a substantial beneficial influence on profitability. Likewise, Fahrul and Rusliati (2016) analyzed the impact of credit risk, market risk, operational risk, and liquidity risk on the profitability of banks in Indonesia. The study indicated that market risk, operational risk, and liquidity risk have positive impact on profitability. Further, Olivia

and Martono (2022) examined the impact of risk on financial performance. The study showed a partial impact of market risk on profitability of banks. Based on it, this study develops the following hypothesis:

H_6 : There is a positive relationship between market risk and banks profitability.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2015/16 to 2022/23.

TABLE 2

DESCRIPTIVE STATISTICS

This table shows the descriptive statistics of dependent and independent variables of 15 Nepalese commercial banks for the study period from 2015/16 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are LDR (Loan- to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), MR (Market risk as measured by the ratio of risk-weighted exposure for market risk to overall risk exposure, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage) and BSIZE (Bank size as measured by total assets, Rs. in billion).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.12	1.59	0.52
ROE	0.91	42.94	13.96	5.32
CAR	9.60	22.99	14.27	2.41
NPL	0.01	5.12	1.56	1.37
LDR	51.09	99.82	83.93	8.67
LLP	0.07	10.39	2.37	1.99
BS	29.38	394.02	135.60	78.05
MRISK	0.01	2.34	0.56	0.63

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 15 Nepalese commercial banks for the study period from 2015/16 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are LDR (Loan- to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), MR (Market risk as measured by the ratio of risk-weighted exposure for market risk to overall risk exposure, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage) and BSIZE (Bank size as measured by total assets, Rs. in billion).

Variables	ROA	ROE	CAR	NPL	LDR	LLP	BS	MRISK
ROA	1							
ROE	0.450**	1						
CAR	0.380**	-0.030	1					
NPL	-0.010	-0.254**	0.040	1				
LDR	-0.168	-0.139	-0.168	-0.090	1			
LLP	-0.250**	-0.227*	0.069	0.454**	0.096	1		
BS	0.135	0.153	0.111	0.133	-0.185*	0.172	1	
MRISK	-0.167	-0.137	0.249**	-0.266**	-0.102	-0.226*	-0.084	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that capital adequacy ratio has a positive relationship with return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. In contrast, there is a negative relationship between non-performing loan and return on assets. It indicates that higher the non-performing loan, lower would be the return on assets. Similarly, there is a negative relationship between loan to deposit ratio and return on assets. It indicates that higher the loan to deposit ratio, lower would be the return on assets. Likewise, loan loss provision has a negative relationship with return on assets. It indicates that higher the loan loss provision, lower would be the return on assets. However, there is a positive relationship between bank size and return on assets. It indicates that increase in bank size leads to increase in return on assets. Further, market risk has a negative relationship with return on assets. It indicates that higher the market risk, lower would be the return on assets.

Similarly, the result also shows that capital adequacy ratio has a negative relationship with return on equity. It indicates that increase in capital adequacy ratio leads to decrease in return on equity. Similarly, there is a negative relationship between non-performing loan and return on equity. It indicates that higher the non-performing loan, lower would be the return on equity. Likewise, there is a negative relationship between loan to deposit ratio and return on equity. It indicates that higher the loan to deposit ratio, lower would be the return on equity. Further, loan loss provision has a negative relationship with return on equity. It indicates that higher the loan loss provision, lower would be the return on equity. However, there is a positive relationship between bank size and return on equity. It indicates that increase in bank size leads to increase in return on equity. Further, market risk has a negative relationship with return on equity. It indicates that higher the market risk, lower would be the return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of capital adequacy ratios, non-performing loans, loan-to-deposit ratios, loan loss provisions, bank size, and market risk with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratios, non-performing loans, loan-to-deposit ratios, loan loss provisions, bank size, and market risk on return on assets

The results are based on panel data of 15 commercial banks with 120 observations for the period of 2015/16 to 2022/23 by using linear regression model. The model is $ROA_{it} = \beta_0 + \beta_1 LDR + \beta_2 MR + \beta_3 CAR + \beta_4 NPL + \beta_5 LLP + \beta_6 BS + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are LDR (Loan- to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), MR (Market risk as measured by the ratio of risk-weighted exposure for market risk to overall risk exposure, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as

measured by the ratio of total capital to total risk weighted exposure, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage) and BSIZE (Bank size as measured by total assets, Rs. in billion).

Model	Intercept	Regression coefficients of					Adj. R_bar²	SEE	F-value	
		CAR	NPL	LDR	LLP	BS				MRISK
1	0.411 (1.534)	0.083 (4.459)**					0.137	0.486	19.966	
2	1.598 (21.842)**		-0.004 (0.109)				0.008	0.526	0.012	
3	2.446 (5.286)**			-0.010 (1.854)			0.020	0.5185	3.436	
4	1.749 (24.087)**				-0.066 (2.802)**		0.054	0.5094	7.850	
5	1.002 (2.484)**					0.124 (1.475)	0.010	0.523	2.176	
6	1.515 (23.840)**						-0.139 (1.835)	0.020	0.5187	3.369
7	0.423 (1.555)	0.083 (4.459)**	-0.010 (0.298)				0.131	0.4884	9.950	
8	1.044 (1.867)	0.079 (4.199)**	-0.013 (0.404)	-0.007 (1.269)			0.135	0.4871	7.205	
9	0.833 (1.549)	0.084 (4.676)**	-0.044 (1.251)	-0.004 (0.731)	-0.085 (3.482)**		0.211	0.4653	8.953	
10	0.181 (0.266)	0.083 (4.589)**	-0.043 (1.205)	-0.002 (0.438)	-0.091 (3.697)**	0.120 (1.548)	0.220	0.4625	7.729	
11	0.159 (0.231)	0.080 (4.291)**	-0.046 (1.260)	-0.002 (0.400)	-0.090 (3.610)**	0.123 (1.571)	-0.031 (0.415)	0.215	0.4642	6.423

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for capital adequacy ratio are positive with return on assets. It indicates that capital adequacy ratio has a positive impact on return on assets. This finding is consistent with the findings of Kumar *et al.* (2020). However, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is consistent with the findings of Kadioglu and Ocal (2017). Similarly, the beta coefficients for loan loss provision are negative with return on assets. It indicates that loan loss provision has a negative impact on return on assets. This finding is similar to the findings of Alhadab and Alsahawneh (2016). Likewise, the beta coefficients for loan to deposit ratio are negative with return on assets. It indicates that loan to deposit ratio has a negative impact on return on assets. This findings is consistent with the findings of Mehta and Bhavani (2017). In contrast, the beta coefficients for bank size are positive with return on assets. It indicates that bank size has a positive impact on return on assets. This finding is consistent with the findings of Lardic and Terraza (2019). However, the beta coefficients for market risk are negative with return on assets. It indicates that market risk has a negative impact on return on assets. This finding is not consistent with the findings of Sondakh (2021).

Table 5 shows the regression results of capital adequacy ratio, non-performing loan, loan to deposit ratio, loan loss provision, bank size, and market risk with return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratios, non-performing loans, loan-to-deposit ratios, loan loss provisions, bank size, and market risk on return on equity

The results are based on panel data of 15 commercial banks with 120 observations for the period of 2015/16 to 2022/23 by using linear regression model. The model is $ROE_{it} = \beta_0 + \beta_1 LDR + \beta_2 MR + \beta_3 CAR + \beta_4 NPL + \beta_5 LLP + \beta_6 BS + e_{it}$ where, the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are LDR (Loan- to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), MR (Market

risk as measured by the ratio of risk-weighted exposure for market risk to overall risk exposure, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage) and BSIZE (Bank size as measured by total assets, Rs. in billion).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		CAR	NPL	LDR	LLP	BS	MRISK			
1	14.905 (5.066)**	-0.066 (0.326)						0.008	5.339	0.106
2	15.505 (21.571)**		-0.989 (2.849)**					0.056	5.166	8.177
3	21.128 (4.477)**			-0.085 (1.527)				0.011	5.289	2.331
4	15.399 (20.769)**				-0.606 (2.528)			0.043	5.202	6.392
5	7.118 (1.743)					1.439 (1.687)		0.015	5.278	2.847
6	13.311 (20.538)**						-1.161 (1.501)	0.010	5.291	2.254
7	16.124 (5.577)**	-0.044 (0.221)	-0.985 (2.826)**					0.049	5.187	4.050
8	25.921 (4.400)**	-0.106 (0.535)	-1.041 (3.008)**	-0.105 (1.902)				0.070	5.130	3.967
9	25.183 (4.252)**	-0.087 (1.792)	-0.839 (2.147)*	-0.095 (1.694)	-0.297 (1.104)			0.071	5.125	3.286
10	15.448 (2.080)*	-0.116 (0.588)	-0.867 (2.251)*	-0.073 (1.299)	-0.384 (1.429)	1.797 (2.118)		0.099	5.049	3.605
11	14.990 (2.008)*	-0.158 (0.776)	-0.804 (2.040)*	-0.069 (1.228)	-0.359 (1.325)	1.851 (2.170)*	-0.632 (0.780)	0.096	5.058	3.095

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Return on equity is the dependent variable.

Table 5 shows that the beta coefficients for non-performing loan are negative with return on equity. It indicates that non-performing loan has a negative impact on return on equity. This finding is similar to the findings of Islam and Rana (2017). Similarly, the beta coefficients for capital adequacy ratio are negative with return on equity. It indicates that capital adequacy ratio has a negative impact on return on equity. This finding is not consistent with the findings of Almumani (2013). Likewise, the beta coefficients for loan to deposit ratio are negative with return on equity. It indicates that loan to deposit ratio has a negative impact on return on equity. This finding is similar to the findings of Purbaningsih and Fatimah (2014). Further, the beta coefficients for loan loss provision are negative with return on equity. It indicates that loan loss provision has a negative impact on return on equity. This finding is consistent with the findings of Pelealu and Worang (2017). However, the beta coefficients of bank size are positive with return on equity. It indicates that bank size has a positive impact on return on equity. This finding is consistent with the findings of Domanovicet *al.* (2018). In contrast, the beta coefficients for market risk are negative with return on equity. It indicates that market risk has a negative impact on return on equity. This finding is not consistent with the findings of Olivia and Martono (2022).

4. Summary and conclusion

Commercial banks play a crucial and dynamic role in the economic development of a country. An efficient, effective, and disciplined banking system fosters fast growth across multiple sectors within a country. Numerous factors may influence the profitability of commercial banks. Essentially, it may be classified into internal and external aspects of the bank. Internal or particular elements of a bank include capital sufficiency, liquidity, operational expenditures, asset quality, management efficiency, and bank size, among others. The escalating phenomenon of globalization has rendered the notion of efficiency increasingly significant for both non-financial and financial entities, with banks being

included among them. Banks mostly rely on competitive marketing strategies that dictate their success and growth.

This study attempts to analyze the impact of credit risk, liquidity, loan loss provision, size and beta on the profitability of Nepalese commercial banks. The study is based on secondary data of 15 commercial banks with 120 observations for the period from 2015/16 to 2022/23.

The major conclusion of this study is that capital adequacy ratio has a positive impact on return on assets. It indicates that higher the capital adequacy ratio, higher would be the return on assets. In contrast, capital adequacy ratio has a negative impact on return on equity. It indicates that increase in capital adequacy ratio leads to decrease in return on equity. However, bank size has a positive impact on return on assets and return on equity. It indicates that higher the bank size, higher would be the return on assets and return on equity. In contrast, non-performing loans, loan-to-deposit ratios, loan loss provisions and market risk have negative impact on return on assets and return on equity. It indicates that higher the non-performing loans, loan-to-deposit ratios, loan loss provisions and market risk, lower would be the return on assets and return on equity. Likewise, the study also concluded that capital adequacy ratio followed by loan loss provision is the most influencing factor that explains the changes in return on asset in the context of Nepalese commercial banks. Similarly, the study also concluded that non-performing loan followed by loan loss provision is the most influencing factor that explains the changes in return on equity in the context of Nepalese commercial banks.

References

- Agu, A. G., G. E. Samuel, and M. H. Ikenna, 2019. Impact of customer touch point management on banks' performance. *Archives of Business Research* 7(3.2), 66-73.
- Ajayi, S. O., H. F. Ajayi, D. J. Enimola, and F. I. Orugun, 2019. Effect of capital adequacy ratio (CAR) on profitability of deposit money banks (DMB's): A study of DMB's with international operating license in Nigeria. *Study Journal of Finance and Accounting* 10(10), 84-91.
- Akbaş, H. E., A. F. Aysan, and S. P. Ceyhan, 2012. Determinants of bank profitability: An investigation on Turkish banking sector. *Öneri Dergisi* 10(37), 103-110.
- Aladwan, M. S., 2015. The impact of bank size on profitability: An empirical study on listed Jordanian commercial banks. *European Scientific Journal* 11(34), 98-113.
- Alexandri, M. B., and T. I. Santoso, 2015. Non-performing loan: Impact of internal and external factor (Evidence in Indonesia). *International Journal of Humanities and Social Science Invention*, 4(1), 87-91.
- Alfadli, A., and H. Rjoub, 2020. The impacts of bank-specific, industry-specific and macroeconomic variables on commercial bank financial performance: evidence from the Gulf cooperation council countries. *Applied Economics Letters* 27(15), 1284-1288.
- Alhadab, M., and S. Alsahawneh, 2016. Loan loss provision and the profitability of commercial banks: Evidence from Jordan. *International Journal of Business and Management*, 11(12), 242-248.
- Almumani, M. A., 2013. Impact of managerial factors on commercial bank profitability: Empirical evidence from Jordan. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 3(3), 298-310.
- Anggari, N. L. S., and I. M. Dana, 2020. The effect of capital adequacy ratio, third party funds, loan to deposit ratio, bank size on profitability in banking companies on IDX. *American Journal of Humanities and Social Sciences Research* 4(12), 334-338.
- Ariwidanta, K. T., and I. G. B. Wiksuana, 2018. The effect of credit and liquidity risk on bank profitability and capital adequacy ratio as mediation variables in Indonesia. *Russian Journal of Agricultural and Socio-*

- Economic Sciences* 81(9), 165-171.
- Bong, D. C., J. J. Sondakh, and C. W. Korompis, 2024. The influence of profitability, liquidity, solvency and company size on audit report lag in infrastructure sector companies listed on the IDX in 2019-2022. *Formosa Journal of Multidisciplinary Research* 3(10), 3747-3766.
- Chowdhury, M. M., and S. Zaman, (2018). Effect of liquidity risk on performance of Islamic banks in Bangladesh. *IOSR Journal of Economics and Finance* 9(4), 01-09.
- Christaria, F., and R. Kurnia, 2016. The impact of financial ratios, operational efficiency and nonperforming loan towards commercial bank profitability. *Accounting and Finance Review* 9(2), 43-50
- Dawood, U., 2014. Factors impacting profitability of commercial banks in Pakistan for the period of (2009-2012). *International Journal of Scientific and Research Publications* 4(3), 1-7.
- Domanović, V., V. Todorović, and S. Savović, 2018. Internal factors of bank profitability in the republic of Serbia. *Journal of Applied Economics and Business* 14(3), 659-673.
- Farhan, N. H., S. A. Aqlan, and M. A. S. Al-Faryan, 2024. Exploring corporate governance practices in Indian banks: the moderation effect of banks size. *International Journal of Procurement Management* 19(4), 525-557.
- Gautam, P. K. 2018. Training culture and employee's performance in Nepali Banking Industry. *The International Research Journal of Management Science* 3(1), 64-80.
- Gazi, M. A. I., R. Karim, A. R. B. S. Senathirajah, A. M. M., Ullah, K. H. Afrin, and M. Nahiduzzaman, 2024. Bank-specific and macroeconomic determinants of profitability of Islamic Shariah-based banks: Evidence from new economic horizon using panel data. *Economies*, 12(3), 66-72.
- Golubeva, O., M. Duljic, and R. Keminen, 2019. The impact of liquidity risk on bank profitability: some empirical evidence from the European banks following the introduction of Basel III regulations. *Journal of Accounting and Management Information Systems* 18(4), 455-485.
- Gul, S., I. Faiza, and Z. Khalid, 2011. Factors affecting bank profitability in Pakistan. *The Romanian Economic Journal* 2(3), 6-19.
- Gurung, J. B., and N. Gurung, 2022. Factors determining profitability of commercial banks: evidence from Nepali banking sector. *Prithvi Academic Journal* 4(1) 100-113.
- Haneef, S., T. M. Riaz, M. A. Ramzan, H. M. Rana, Ishaq, and Y. Karim, 2012. Impact of risk management on non-performing loans and profitability of banking sector of Pakistan. *International Journal of Business and Social Science* 3(7), 307-315.
- Iloska, N., 2014. An analysis of bank profitability in Macedonia. *Journal of Applied Economics and Business* 2(1), 31-50.
- Irawati, N., A. Maksum, I. Sadalia, and I. Muda, 2019. Financial performance of Indonesian's banking industry: the role of good corporate governance, capital adequacy ratio, non-performing loan and size. *International Journal of Scientific and Technology Research* 8(4), 22-26.
- Islam, M. A., and R. H. Rana, 2017. Determinants of bank profitability for the selected private commercial banks in Bangladesh: A panel data analysis. *Banks and Bank Systems* 12(3), 179-192.
- Kadioglu, E., and N. Ocal, 2017. Effect of the asset quality on the bank profitability. *International Journal of Economics and Finance* 9(7), 60-68.
- Kumar, V., S. Acharya, and L. T. Ho, 2020. Does monetary policy influence the profitability of banks in New Zealand? *International Journal of Financial Studies* 8(2), 35-55.
- Lardic, S., and V. Terraza, 2019. Financial ratios analysis in determination of bank performance in the German banking sector. *International Journal of Economics and Financial Issues* 9(3), 22-47.

- Levine, R., 1997. Financial development and economic growth: views and agenda. *Journal of Economic Literature* 35(2), 688-726.
- Lohano, K., and M. Kashif, 2019. Factors affecting the profitability of banks in developing countries. *NUML International Journal of Business and Management* 14(2), 2410-5392.
- Lubis, Z. S., and N. Nurlaila, 2023. The influence of third party funds, non performing financing, and capital adequacy ratio on profitability with profit shared financing as an intervening variable at bank muamalat Indonesia period 2014-2021. *JurnalEkonomi* 12(01), 305-317.
- Masood, O., and M. Ashraf, 2012. Bank-specific and macroeconomic profitability determinants of Islamic banks: The case of different countries. *Qualitative Research in Financial Markets* 4(2), 255-268.
- Mathuva, D. M., 2009. Capital adequacy, cost income ratio and the performance of commercial banks: The Kenyan Scenario. *The International Journal of Applied Economics and Finance* 3(2), 35-47.
- Mehta, A., and G. Bhavani, 2017. What determines banks' profitability? Evidence from emerging markets-The case of the UAE banking sector. *Accounting and Finance Research* 6(1), 77-88.
- Mohanty, B. K., and R. Krishnankutty, 2018. Determinants of profitability in Indian banks in the changing scenario. *International Journal of Economics and Financial Issues* 8(3), 235-240.
- Muhindi, K. A., and D. Ngaba, 2018. Effect of firm size on financial performance on banks: Case of commercial banks in Kenya. *International Academic Journal of Economics and Finance* 3(1), 175-190.
- Niresh, A., and V. Thirunavukkarasu, 2014. Firm size and profitability: A study of listed manufacturing firms in Sri Lanka. *International journal of business and management* 9(4), 57-63.
- Nuhiu, A., A. Hoti, and M. Bektashi, 2017. Determinants of commercial banks profitability through analysis of financial performance indicators: evidence from Kosovo. *Business: Theory and Practice* 18(1), 160-170.
- Olivia, C., A. D. R. Atahau, and S. Martono, 2022. Financial risk and performance of national private foreign exchange commercial bank: Moderating effects of bank size. *Jurnal Keuangan dan Perbankan* 26(1), 229-246.
- Onuonga, S. M., 2014. The analysis of profitability of Kenyas top six commercial banks: Internal factor analysis. *American International Journal of Social Science* 3(5), 94-103.
- Ozili, P. K., and E. Outa, 2017. Bank loan loss provisions research: A review. *Borsa Istanbul Review* 17(3), 144-163.
- Pelealu, I. W., and F. G. Worang, 2017. Analysis the effect of loan loss provision on bank profitability. *Jurnal EMBA: JurnalRisetEkonomi, Manajemen, Bisnis Dan Akuntansi* 6(4), 3278 – 3287.
- Poudel, S. R., 2018. Impact of credit risk on profitability of commercial banks in Nepal. *Journal of Applied and Advanced Research* 3(6), 161-170.
- Purbaningsih, R. Y. P., and N. Fatimah, 2014. The effect of liquidity risk and non performing financing (NPF) ratio to commercial Sharia bank profitability in Indonesia. *LTA* 60(80), 100-203.
- Puspitasari, E., B. Sudiyatno, W. E. Hartoto, and L. W. Widati, 2021. Net interest margin and return on assets: A case study in Indonesia. *The Journal of Asian Finance, Economics and Business* 8(4), 727-734.
- Riaz, S., and A. Mehar, 2013. The impact of bank specific and macroeconomic indicators on the profitability of commercial banks. *Romanian Economic Journal* 16(47), 194-203.
- Sahyouni, A., and M. Wang, 2018. The determinants of bank profitability: Does liquidity creation matter? *Journal of Economics and Financial Analysis* 2(2), 61-85.
- San, O. T., and T. B. Heng, 2013. Factors affecting the profitability of Malaysian commercial banks. *African Journal of Business Management* 7(8), 649-660.

- Shittu, I., and H. Abdulkadir, 2023. The moderating effect of cost per loan asset ratio on the relationship between credit risk and financial performance of listed deposit money banks in Nigeria. *International Journal of Banking and Finance* 18(1), 95-115.
- Singh, S. K., B. Basuki, and R. Setiawan, 2021. The effect of non-performing loan on profitability: Empirical evidence from Nepalese commercial banks. *The Journal of Asian Finance, Economics and Business* 8(4), 709-716.
- Smirlock, M. 1985. Evidence on the (Non) relationship between concentration and profitability in banking. *Journal of Money, Credit and Banking* 17(1), 69-83.
- Sondakh, J. J., J. E. Tulung, and H. Karamoy, 2021. The effect of third-party funds, credit risk, market risk, and operational risk on profitability in banking. *Journal of Governance and Regulation* 10(2), 179–185.
- Steven, S., and N. Toni, 2020. The effect of bank capacity and loan to deposit ratio on profitability and credit risk. *International Journal of Multicultural and Multireligious Understanding* 7(11), 1-9.
- Suyono, T., O. Chandra, and G. Irawati, 2017. Analysis of factors affecting banking profitability (study of commercial banks in Indonesia for the Period 2006-2010). *Procuratio*, 5 (2), 262-275.
- Swandewi, N. K. M., and N. K. Purnawati, 2021. Capital adequacy ratio mediates the effect of non-performing loan on returns on assets in public commercial banks. *American Journal of Humanities and Social Sciences Research* 5(1), 651-656.
- Tafri, F. H., Z. Hamid, A. Meera, and M. A. Omar, 2010. The impact of financial risks on profitability of Malaysian Commercial Banks: 1996-2005. *Journal of Emerging Market Finance* 3(4), 89-98.
- Tharu, N. K., and Y. M. Shrestha., 2019. The influence of bank size on profitability: An application of statistics. *International Journal of Financial, Accounting, and Management* 1(2), 81-89.
- Vinh, N. T. H., 2017. The impact of non-performing loans on bank profitability and lending behavior: Evidence from Vietnam. *Journal of Economic Development* 24(3), 27-44.

Part VII:

Profitability Management

Chapter 24

Impact of liquidity on profitability of Nepalese commercial banks

- Archana Timalsina*

Abstract

This study examines the impact of liquidity on the profitability of Nepalese commercial banks. Return on assets and return on equity are the selected dependent variables. The selected independent variables are investment ratio, capital ratio, liquidity ratio, cash-deposit ratio and deposit assets ratio. The study is based on secondary data of 18 commercial banks with 126 observations for the study period from 2015/16 to 2021/22. The data were collected from annual report and audited financial statement of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of liquidity on the profitability of Nepalese commercial banks.

The study also showed that liquidity ratio has a negative effect on return on assets. It indicates that higher the liquidity ratio, lower would be the return on assets and return on equity. However, the study shows that cash to deposit ratio has a positive effect on return on assets and return on equity. It reveals that higher the cash to deposit ratio, higher would be the return on assets and return on equity. Likewise, deposit-assets ratio has positive effect on return on assets and return on equity. It means that higher the deposit-assets ratio, higher would be the return on assets and return on equity. On the other hand, the results showed that capital ratio has positive effect on return on equity. It indicates that increase in capital ratio leads to increase in return on equity. In contrast, investment ratio has a negative effect on return on assets and return on equity. It indicates that increase in investment ratio leads to decrease in return on assets and return on equity.

Keywords: investment ratio, capital ratio, liquidity ratio, cash-deposit ratio, deposit-assets ratio, return on assets, return on equity

1. Introduction

Every corporate organization, regardless of its size and nature, is involved in financial management to secure the ongoing operations of the firm. Various sectors of the business are affected by distinct influencing elements. The viability and expansion of the banking and financial industry are significantly influenced by liquidity and profitability. Liquidity refers to the capacity of a financial organization to fulfill its obligations to its creditors. Banks and financial organizations are required to maintain a significant portion of their assets in the form of cash in order to meet this commitment. An optimal degree of liquidity enables financial organizations to acquire a competitive edge and maintain long-term stability. Financial organizations must determine the optimal degree of liquidity to guarantee maximum profitability (Dabiri et al., 2017). A robust and enduring financial system is evidently crucial in fostering the expansion and advancement of commercial endeavors within any given economy. Profits typically serve as reserves to protect against adverse shocks. Moreover, due to the higher level of financial commitment, banks are less inclined to take risks since their potential for future profits serves as a constraint. The degree of profitability of a bank is of utmost importance for maintaining financial stability. Additionally, the origin of its revenue is also a significant factor to consider. The profitability of commercial banks is contingent upon several things. Profitability and liquidity are key indicators of a company's health and overall success, not only in the banking industry but also in other profit-oriented institutions. The indicators and data on the health and performance of the organization are crucial to the shareholders and depositors, who are the primary stakeholders of financial institutions. The primary focus of shareholders is profitability, whereas depositors are primarily concerned with the liquidity function of a bank, which defines its capacity to meet withdrawal demands, whether they are immediate or need little notice. The banking industry is a vital component of the economy. The decisions taken by financial managers regarding the bank's liquidity level have a direct influence on the purpose of maximizing profits for banks (Ibe, 2013). The occurrence of financial crises has emphasized

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the significant role that liquidity can play in the functioning of banks.

Typically, a high liquidity ratio indicates strong financial health (Chandra, 2001). However, certain studies suggest that an excessively high liquidity ratio can also indicate mismanagement issues within a company. This implies that the company has not effectively utilized its assets to maximize profits, as the profitability of current assets is lower than that of fixed assets. Financial institutions should endeavor to maintain an optimal level of liquidity to prevent any immediate liquidity constraints. To maintain the right balance, it is important to prevent excessive or insufficient liquidity in relation to the bank's desired operating level. Optimal liquidity management requires maintaining a delicate equilibrium between profitability and liquidity (Akinwumi et al., 2017).

Managing liquidity and profitability is crucial for the development, survival, sustainability, growth, and enhanced performance of commercial banks. The profitability of commercial banks does not always necessarily reflect their liquidity management. Occasionally, banks can generate profits without possessing sufficient liquidity. Therefore, it is crucial to effectively control the liquidity of banks in order to achieve an optimal level. This optimal level ensures that there is neither an excessive amount of liquidity, which might lead to a lack of innovative ideas from management, nor a shortage of liquidity (Edem, 2017). Simultaneously, it is imperative that the amount of liquidity does not dip below the minimal threshold, since this would render the organization unable of fulfilling its immediate financial obligations. Due to these factors, all commercial banks are using diverse ways to enhance their liquidity position. The viability of any bank is contingent upon its liquidity, as even with sufficient capital, a lack of liquidity can result in severe and rapid adverse consequences. It is crucial to swiftly handle any shortages of liquid assets in order to reduce the possibility of bank runs. Any surplus liquidity over the required threshold should be directed into investments in the real sector, as these excesses hinder performance (Gertler and Kiyotaki, 2017). Financial institutions that possess stable liquidity balances tend to attract significant amounts of deposit inflows and have a discernible pattern of stability. Customers prefer to deposit their savings with financial institutions that have consistent cash flows and strong liquidity situations (Chang and Velasco, 1999).

Fauziah and Fadhilah (2022) conducted an empirical investigation into the effects of non-performing loans on return on assets (ROA) within the banking sector, specifically focusing on institutions listed on the Indonesia Stock Exchange from 2015 to 2019. The findings revealed that non-performing loans exert a significant impact on ROA, with a notably large and negative effect. Conversely, the loan-to-deposit ratio was found to have a substantial and positive influence on ROA. Begum et al. (2022) conducted a study to scrutinize how liquidity management affects the profitability of banks in Bangladesh. The study showed that the current ratio has a favorable influence on bank profitability. Additionally, the capital adequacy ratio and interest rates have a statistically significant effect on the bank's performance. Malik et al. (2016) examined the relationship between liquidity and profitability in private sector banks in Pakistan. The empirical results demonstrated a statistically significant association between return on assets and bank liquidity measures. However, the correlation became insignificant when return on investment and return on equity were considered as indicators of profitability.

Solanki and Aggrawal (2022) examined how bank-specific characteristics impact the financial performance of private-sector banks. The study revealed that when analyzing the profitability of private sector banks using return on assets (ROA), expense management and liquidity risk have a detrimental effect on the financial performance of some private sector banks. However, solvency has a favorable influence on the financial performance of certain Indian private sector banks. Liquidity risk and expenditure management have a detrimental influence on the financial performance of specific private sector banks when Return on Equity (ROE) is utilized as a measure of profitability for these

institutions. However, some Indian private sector banks see a favorable influence on their financial performance due to their capital sufficiency and solvency. Charmler *et al.* (2018) scrutinized the extent, pattern, and influence of bank liquidity on the profitability of commercial banks operating in Ghana. The study showed a positive relationship between liquidity and return on assets. The ratios of liquid assets to total assets show a weak positive association with respect to return on equity. The ratio of liquid assets to total interest-bearing liabilities and return on equity (ROE) showed an insignificant negative association. The study found a positive correlation between bank profitability and the control variables, net interest margin, foreign ownership, bank size, and capital adequacy ratio. Danmulki *et al.* (2022) examined the impact of liquidity management on the financial performance of Nigerian deposit money institutions listed on the stock exchange. The findings indicated a strong and substantial correlation between the capital adequacy ratio and the financial performance of deposit money institutions listed in Nigeria. The liquidity ratio has a substantial influence on the financial performance of Nigerian banks. A high ratio would lead to low strategic performance for the banks. The loan-to-deposit ratio has a beneficial impact on financial performance; however, the effect is not large.

In Nepalese context, Khati (2020) examined the correlation between liquidity and profitability of commercial banks in Nepal. The findings of the Hausman test and the fixed effects technique indicate that asset quality (AQ) is negatively and significantly correlated with return on assets (ROA), but positively and significantly correlated with return on equity (ROE). The cash-deposit ratio (CADR) and return on investment have a positive although insignificant correlation. Pandey and Budhathoki (2020) investigated the influence of liquidity on the profitability of commercial banks in Nepal. The study's findings indicate an inverse correlation between investment and liquidity ratios and return on assets. This implies that higher ratios are associated with lower returns on assets, and vice versa. Furthermore, it has been found that there is a direct relationship between capital ratios and return on assets, indicating that greater capital ratios in a bank are associated with improved returns on assets. Bhatt and Verghese (2018) investigated the correlation between the profitability and liquidity of commercial banks in Nepal. Based on this empirical study, there is a negligible positive link between return on assets and liquidity ratio. Similarly, there is a negligible negative correlation between return on assets and the investment and capital ratios. Furthermore, no notable correlation between the net profit margin and the investment and liquidity ratios is seen. However, there exists a substantial inverse correlation between the capital ratio and the net profit margin. The results suggest that, except from the capital ratio, the liquidity measures did not have a statistically significant effect on the profitability of commercial banks in Nepal.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the effect of liquidity ratio on banks profitability. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of this study is to examine the effect of liquidity on the profitability of Nepalese commercial banks. Specifically, it examines the effect of investment ratio, capital ratio, liquidity ratio, cash-deposit ratio and deposit assets ratio on the profitability of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 18 Nepalese commercial banks from 2015/16 to 2021/22, leading to a total of 126 observations. The study employed convenience

sampling method. The main sources of data collected from are the Bank Supervision Report published by Nepal Rastra Bank (NRB), Economic Survey Report published by Ministry of Finance and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	No of observation
1	Nepal Investment Bank Limited	2015/16 - 2021/22	7
2	Nepal SBI Bank Limited	2015/16 - 2021/22	7
3	NMB Bank Limited	2015/16 - 2021/22	7
4	Nepal Bank Limited	2015/16 - 2021/22	7
5	Agricultural Development Bank Limited	2015/16 - 2021/22	7
6	Nabil Bank Limited	2015/16 - 2021/22	7
7	Standard Chartered Bank Nepal Limited	2015/16 - 2021/22	7
8	Himalayan Bank Limited	2015/16 - 2021/22	7
9	Everest Bank Limited	2015/16 - 2021/22	7
10	Kumari Bank Limited	2015/16 - 2021/22	7
11	Laxmi Bank Limited	2015/16 - 2021/22	7
12	Citizens Bank International Limited	2015/16 - 2021/22	7
13	Prime Commercial Banks Limited	2015/16 - 2021/22	7
14	Sunrise Bank Limited	2015/16 - 2021/22	7
15	Sanima Bank Limited	2015/16 - 2021/22	7
16	Machhapuchchhre Bank Limited	2015/16 - 2021/22	7
17	NIC Asia Bank Limited	2015/16 - 2021/22	7
18	Rastriya Banijya Bank Limited	2015/16 - 2021/22	7

Source: Annual reports

Thus, the study is based on 126 observations.

The model

The model used in this study assumes that profitability of banks depends upon investment ratio, capital ratio, liquidity ratio, cash-deposit ratio and deposit-assets ratio. The dependent variables selected for the study are return on assets and return on equity. Therefore, the models take the following forms:

$$ROA_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 CDR_{it} + \beta_3 LDR_{it} + \beta_4 DAR_{it} + \beta_5 LR_{it} + \beta_6 CR_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 CDR_{it} + \beta_3 LDR_{it} + \beta_4 DAR_{it} + \beta_5 LR_{it} + \beta_6 CR_{it} + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

IR = Investment ratio as measured by the ratio of loan to deposit, in percentage.

CDR= Cash to deposit ratio as measured by the ratio of total cash to total deposit, in percentage.

DAR= Deposit to assets ratio as measured by the ratio of total deposit to total assets, in percentage.

LR= Liquidity ratio measured as measured by the ratio of liquid assets to total assets, in percentage.

CR= Capital ratio as measured by the ratio of total equity to total assets, in percentage.

The following section describes the independent variables used in this study along with hypothesis formulation:

Investment ratio

It is a crucial indicator of the bank's liquidity. This ratio is utilized to assess the liquidity status of a bank by comparing the bank's total loans to its total deposits within the same time frame. When the investment ratio is very high, it suggests that the bank may lack sufficient liquidity to meet unexpected financial needs. Conversely, if the ratio is too low, the bank's potential earnings may be limited. Malik and Aqeel (2017) asserted that the investment ratio is a measure of how suitable it is to invest the funds obtained from deposits in the bank to fulfill the requirements of loans and advances. The study also found a statistically significant positive correlation between the investment ratio and profitability of commercial banks in Pakistan. According to Quoc Trung (2021), there is a strong positive correlation between the loan to deposit ratio and a bank's success. Furthermore, Fauziah and Fadhilah (2022) discovered that the loan to deposit ratio has a favorable and substantial impact on the return on assets. Edem (2017) found a favorable correlation between return on equity and liquidity management factors. Based on it, the study develops following hypothesis:

H₁: There is a positive correlation between investment ratio and bank profitability.

Capital ratio

The capital ratio, commonly referred to as the equity to assets ratio, is a metric used to evaluate a bank's liquidity and analyze its financial health and stability. It serves as a proxy for the bank's capital adequacy by assessing its capacity to absorb losses. As to the findings of Malik and Aqeel (2017), "the capital ratio serves as a metric to assess a bank's financial robustness and the sufficiency of its capital. It also provides an indication of the level of financial stability at the bank". Saeed (2014) found that the capital ratio has a beneficial effect on both return on assets (ROA) and return on equity (ROE). Ongore and Kusa (2013) discovered that the capital ratio had a considerable impact on the performance of commercial banks in Kenya. The financial performance of selected private sector banks in India is positively influenced by their capital adequacy and solvency (Solanki and Aggrawal, 2022). In addition, Abbas et al. (2019) stated that bank capital has a favorable effect on profitability. Furthermore, Begum et al. (2022) revealed that the capital adequacy ratio has a considerable statistical impact on the bank's performance. Based on it, the study develops following hypothesis:

H₂: There is a positive correlation between capital ratio and bank profitability.

Liquidity ratio

Liquid assets refer to the combination of cash, cash reserves held at the central bank, short-term deposits in banks, and government and non-government backed securities. Liquidity risk is a type of risk that banks encounter. When they own a smaller amount of liquid assets, they become more vulnerable to substantial withdrawals of deposits. The study conducted by Malik and Aqeel (2017) found a substantial negative correlation between the liquid ratio and profitability of Pakistani commercial banks. Danmulki et al. (2022) discovered that the liquidity ratio has a significant and

adverse effect on the financial performance of Nigerian banks. This implies that a high ratio would lead to poor strategic performance for banks. Additionally, Ferrouhi (2014) found that there is a negative association between return on assets and liquidity ratios. Based on it, the study develops following hypothesis:

H₃: There is a negative correlation between liquidity ratio and bank profitability.

Cash-deposit ratio

A higher cash-deposit ratio signifies that a greater proportion of the bank's deposits is being retained in cash instead of being used for operations that generate income (Zaharum et al., 2022). This often leads to reduced profitability as a result of missed opportunities to generate interest money. According to Sumathy and Jisha (2022), there is a negative correlation between the cash-deposit ratio of banks and their profitability. This means that banks with a larger cash-deposit ratio are more likely to have poorer profitability. An adverse effect of the cash-deposit ratio on profitability implies that as a bank's cash-deposit ratio rises, its profitability generally declines. This phenomenon arises due to a higher cash-deposit ratio, which signifies that a greater proportion of the bank's deposits is allocated to cash rather than being utilized for loans or investments, which are often more lucrative. Cash holdings often provide lesser returns in comparison to assets that generate income, resulting in lost possibilities for better returns. Mohanty and Mehrotra (2018) found that banks experience a decrease in profitability when they allocate a larger portion of their deposits to cash. This is due to the reduction in prospective revenues from loans and investments. Therefore, although it is crucial to have sufficient liquidity, large cash reserves might impede a bank's financial success by restricting the creation of income. Based on it, the study develops following hypothesis:

H₄: There is a negative correlation between cash-deposit ratio and bank profitability.

Deposit-assets ratio

A rise in the deposit-assets ratio has a beneficial effect on the bank's profitability. A greater ratio of deposits compared to total assets is associated with increased profitability. According to Elisa and Guido (2016), a greater deposit-assets ratio indicates that a bank is utilizing deposits more efficiently to fund its assets. This often results in reduced financing expenses and improved profitability. The correlation implies that banks with a greater proportion of deposits to assets tend to be more lucrative. A greater deposit-assets ratio might also signify a more secure source of funding, which helps bolster the bank's financial stability and mitigate the danger of liquidity issues. This consistency has the potential to enhance financial success (Shah and Khan, 2017). Furthermore, according to O'Connell (2022), a greater deposit-assets ratio frequently grants banks with more secure and cost-effective capital, which may be utilized for lending and investing. Loans and investments have the potential to create interest revenue, which can result in increased profitability. Khan (2022) asserted that deposits are often a more cost-effective means of funding for banks in comparison to alternative sources of financing, such as borrowing. A bank with a greater deposit-assets ratio is financing a bigger proportion of its assets with relatively low-cost deposits, which might possibly reduce its overall funding expenses. Based on it, the study develops following hypothesis:

H₅: There is a positive correlation between deposit-assets ratio and bank profitability.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2015/16 to 2021/22.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 18 Nepalese commercial banks for the study period from 2015/16 to 2021/22. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are IR (Investment ratio as measured by the ratio of loan to deposit, in percentage), CDR (Cash to deposit ratio as measured by the ratio of total cash to total deposit, in percentage), CR (Capital ratio as measured by the ratio of total equity to total assets, in percentage), LR (Liquidity ratio measured as measured by the ratio of liquid assets to total assets, in percentage), and DAR (Deposit to assets ratio as measured by the ratio of total deposit to total assets, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	5.07	56.33	15.16	7.10
ROE	0.45	2.85	1.57	0.48
CR	2.69	20.54	11.49	2.87
IR	6.80	146.47	80.26	24.74
LR	0.44	33.70	6.77	4.85
CDR	0.07	12.44	2.90	1.79
DAR	67.67	91.82	79.59	4.30

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficient of dependent and independent variables of 18 Nepalese commercial banks for the study period from 2015/16 to 2021/22. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are IR (Investment ratio as measured by the ratio of loan to deposit, in percentage), CDR (Cash to deposit ratio as measured by the ratio of total cash to total deposit, in percentage), CR (Capital ratio as measured by the ratio of total equity to total assets, in percentage), LR (Liquidity ratio measured as measured by the ratio of liquid assets to total assets, in percentage), and DAR (Deposit to assets ratio as measured by the ratio of total deposit to total assets, in percentage).

Variables	ROA	ROE	CR	IR	LR	CDR	DAR
ROA	1						
ROE	0.414**	1					
CR	-0.128	0.340**	1				
IR	-0.136	-0.254**	0.030	1			
LR	-0.020	0.163	0.149	-0.052	1		
CDR	0.111	0.220*	0.001	-0.011	-0.053	1	
DAR	0.340**	0.189*	-0.355**	-0.169	0.023	0.156	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that capital ratio is negatively correlated to return on assets. It indicates that increase in capital ratio leads to decrease in return on assets. The study also shows that investment ratio is negatively related to return on assets. It reveals that increase in investment ratio leads to decrease in return on assets. Likewise, the study also shows that liquidity ratio is negatively related to return on assets. It indicates that higher the liquidity ratio, lower would be the return on assets. However, the

study shows that cash to deposit ratio has a positive relationship with return on assets. It reveals that higher the cash to deposit ratio, higher would be the return on assets. Likewise, deposit-assets ratio has positive relationship with return on assets. It means that higher the deposit-assets ratio, higher would be the return on assets.

On the other hand, the results show that there is a positive relationship between return on equity and capital ratio. It indicates that increase in capital ratio leads to increase in return on equity. Similarly, investment ratio is negatively correlated to return on equity. It indicates that increase in investment ratio leads to decrease in return on equity. The study also shows that liquidity ratio is positively related to return on equity. It reveals that increase in liquidity ratio leads to increase in return on equity. Likewise, the study also shows that cash-deposit ratio has positive relationship with return on equity. It indicates that higher the cash-deposit ratio, higher would be the return on equity. Similarly, deposit-assets ratio has positive relationship with return on equity. It means that higher the deposit-assets ratio, higher would be the return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of investment ratio, capital ratio, liquidity ratio, deposit-to-assets ratio, and cash-to-deposit ratio on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of capital ratio, investment ratio, liquidity ratio, cash-deposit ratio and deposit-assets ratio on return on assets

The results are based on panel data of 18 commercial banks with 126 observations for the study period of 2015/16 to 2021/22 with the linear regression model and the model is $ROA_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 CDR_{it} + \beta_3 DAR_{it} + \beta_4 LR_{it} + \beta_5 CR_{it} + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage). The independent variables are IR (Investment ratio as measured by the ratio of loan to deposit, in percentage), CDR (Cash to deposit ratio as measured by the ratio of total cash to total deposit, in percentage), CR (Capital ratio as measured by the ratio of total equity to total assets, in percentage), LR (Liquidity ratio measured as measured by the ratio of liquid assets to total assets, in percentage), and DAR (Deposit to assets ratio as measured by the ratio of total deposit to total assets, in percentage).

Model	Intercept	Regression coefficients of					Adj. R _{bar} ²	SEE	F-value
		CR	IR	LR	CDR	DAR			
1	18.803 (7.202)**	-0.317 (1.440)					0.009	7.070	2.073
2	18.288 (8.530)**		-0.039 (1.529)				0.011	7.063	2.337
3	15.356 (0.301)**			-0.30 (0.226)			0.008	7.127	0.51
4	13.870 (11.488)**				0.443 (1.249)*		0.004	7.085	1.559
5	-29.446 (2.652)					0.560 (4.023)*	0.280	6.705	16.183
6	-2.444 (2.940)**	-0.076 (5.224)**		-0.009 (1.100)		0.039 (4.065)**	0.214	0.428	12.323
7	18.593 (7.844)**		-0.039 (1.537)	-0.040 (0.037)			0.003	7.089	1.207
8	-28.909 (2.529)*				0.237 (0.697)	0.545 (3.856)**	0.105	6.719	8.301
9	-28.287 (2.204)*	-0.022 (0.097)				0.555 (3.712)**	0.101	6.732	8.032

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for capital ratio are negative with return on assets. It indicates that capital ratio has a positive impact on return on assets. This finding is similar to the findings of Ongore and Kusa (2013). Likewise, the beta coefficients for investment ratio are negative with return on assets. It indicates that investment ratio has a negative impact on return on assets. This finding is consistent with the findings of Fauziah and Fadhillah (2022). However, the beta coefficients for cash to deposit ratio are positive with return on assets. It indicates that cash to deposit ratio has a positive impact on return on assets. This finding is similar to the findings of Sumathy and Jisha (2022). Similarly, the beta coefficients for deposit to assets ratio are positive with return on assets. It indicates that deposit to assets ratio has a positive impact on return on assets. This finding is consistent with the findings of O'Connell (2022). In addition, the beta coefficients for liquidity ratio are negative with return on assets. It indicates that liquidity ratio has a negative impact on return on assets. This finding is similar to the findings of Danmulki et al. (2022).

Table 5 shows the regression results of investment ratio, capital ratio, liquidity ratio, deposit-to-assets ratio, and cash-to-deposit ratio on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of investment ratio, capital ratio, liquidity ratio, deposit-to-assets ratio, and cash-to-deposit ratio on return on equity

The results are based on panel data of 18 commercial banks with 126 observations for the study period of 2015/16 to 2021/22 with the linear regression model and the model is $ROE_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 CDR_{it} + \beta_3 DAR_{it} + \beta_4 LR_{it} + \beta_5 CR_{it} + e_{it}$ where, the dependent variable is ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are IR (Investment ratio as measured by the ratio of loan to deposit, in percentage), CDR (Cash to deposit ratio as measured by the ratio of total cash to total deposit, in percentage), CR (Capital ratio as measured by the ratio of total equity to total assets, in percentage), LR (Liquidity ratio measured as measured by the ratio of liquid assets to total assets, in percentage), and DAR (Deposit to assets ratio as measured by the ratio of total deposit to total assets, in percentage).

Model	Intercept	Regression coefficients of					Adj. R_bar ²	SEE	F-value
		CR	IR	LR	CDR	DAR			
1	0.916 (5.443)**	0.057 (4.026)**					0.108	0.455	16.025
2	1.972 (13.857)**		-0.005 (2.927)**				0.057	0.468	8.569
3	1.463 (19.946)**			0.016 (1.845)			0.019	0.478	3.402
4	1.401 (17.393)**				0.059 (2.506)*		0.041	0.472	6.278
5	-0.109 (-0.138)					0.021 (2.138)*	0.028	0.475	4.569
6	0.010 (0.013)				0.053 (2.216)*	0.018 (1.798)	0.057	0.468	4.812
7	0.072 (5.099)**	0.054 (3.729)**		0.011 (1.354)			0.114	0.454	9.075
8	-2.444 (2.940)	0.076 (5.224)		0.009 (1.100)		0.039 (4.065)	0.214	0.428	12.323
9	-1.808 (2.090)*	0.075 (3.709)**	-0.004 (2.359)*			0.035 (3.709)**	0.241	0.420	14.197

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Return on equity is the dependent variable.

Table 5 shows that the beta coefficients for capital ratio are positive with return on equity. It indicates that capital ratio has a positive impact on return on equity. This finding is similar to the findings of Solanki and Aggrawal (2022). Likewise, the beta coefficients for investment ratio are negative with return on equity. It indicates that investment ratio has a negative impact on return on equity. This finding is consistent with the findings of Edem (2017). However, the beta coefficients for cash to deposit ratio are positive with return on equity. It indicates that cash to deposit ratio has a

positive impact on return on equity. This finding is similar to the findings of Mohanty and Mehrotra (2018). Similarly, the beta coefficients for deposit to assets ratio are positive with return on equity. It indicates that deposit to assets ratio has a positive impact on return on equity. This finding is consistent with the findings of Khan (2022). In addition, the beta coefficients for liquidity ratio are positive with return on equity. It indicates that liquidity ratio has a positive impact on return on equity. This finding is similar to the findings of Ferrouhi (2014).

4. Summary and conclusion

A strong financial system plays a critical role in enabling growth and reducing vulnerability to crises among commercial banks. Stability of the financial system in an economy is an important catalyst for economic growth due to its function in facilitating exchange of value. The high level of bank capital boosts the confidence and trust of the public about the soundness of the bank. Profitability, in particular, plays a crucial role in ensuring the stability of the banking system. When a bank maintains good profitability, it not only benefits its shareholders but also serves as a channel for capital, supporting investments by individuals and organizations. This, in turn, promotes the development of the entire economy.

This study attempts to analyze the effect of liquidity on the profitability of commercial banks in Nepal. The study is based on secondary data of 18 commercial banks with 126 observations for the period from 2015/16 to 2021/22.

The major conclusion of the study is that investment ratio has a negative effect on return on assets and return on equity. Similarly, capital ratio, liquidity ratio, deposit-to-assets ratio, and cash-to-deposit ratio have positive effect on return on equity. It implies that banks with robust capital reserves, ample liquidity, and efficient asset and cash management practices are better positioned to enhance shareholder value. Therefore, while investments are crucial, the findings stressed the importance of maintaining a balanced approach to managing capital, liquidity, and deposits to optimize returns. The study also concluded that although increased investments may diminish profitability and equity returns, maintaining strong capital reserves, liquidity, and effective asset management can enhance equity performance.

References

- Abbas, F., S. Iqbal, and B. Aziz, 2019. The impact of bank capital, bank liquidity and credit risk on profitability in postcrisis period: A comparative study of US and Asia. *Cogent Economics and Finance* 7(1), 1-18.
- Akinwumi, I. A., J. M. Essien, and R. Adegboyega, 2017. Liquidity management and banks performance in Nigeria. *Business Management and Economics* 5(6), 88-98.
- Begum, H., M. M. Rashid, M. S. Haque, and M. M. Uddin, 2022. Effect of liquidity on profitability of banks using revisited panel data analysis: Does ownership structure matter? *International Journal of Asian Social Science* 12(6), 205-216.
- Bhatt, S., and N. Verghese, 2018. Influence of liquidity on profitability: Evidence from Nepalese banks. *International Journal of Multidisciplinary and Current Research* 6(5), 1085-1090.
- Chandra, P., 2001. *Financial Management*. 7th edition (McGraw-Hill, New York).
- Chang, R., and A. Velasco, 1999. Liquidity crises in emerging markets: theory and policy. *NBER Macroeconomics Annual* 14(1), 11-58.

- Charmier, R., 2018. The impact of liquidity on performance of commercial banks in Ghana. *Academic Journal of Economic Studies* 4(4), 78–90.
- Dabiri, A. M., R. M. Yusof, and N. A. Wahab, 2017. Profitability and liquidity of Islamic banks in the United Kingdom. *Asian Journal of Multidisciplinary Studies* 5(4), 66-71.
- Danmulki, B. I., E. S. Agbi, and L. O. Mustapha, 2022. Liquidity management and financial performance of listed money banks in Nigeria. *Gusau Journal of Accounting and Finance* 3(2), 18-28.
- Edem, D. B., 2017. Liquidity management and performance of deposit money banks in Nigeria (1986–2011): An investigation. *International Journal of Economics, Finance and Management Sciences* 5(3), 146-161.
- Elisa, M., and P. Guido, 2016. Factors affecting bank profitability in Europe: An empirical investigation. *African Journal of Business Management* 10(17), 410-420.
- Fauziah, R. S., and N. H. K. Fadhilah, 2022. The impact of credit risk on the profitability with characteristics bank as control variables. *JAK (Jurnal Akuntansi) Kajian Ilmiah Akuntansi* 9(2), 145-158.
- Ferrouhi, E. M., 2014. Bank liquidity and financial performance: Evidence from Moroccan banking industry. *Business: Theory and Practice* 15(4), 351-361.
- Gertler, M., and N. Kiyotaki, 2015. Banking, liquidity, and bank runs in an infinite horizon economy. *American Economic Review* 105(7), 2011-2043.
- Ibe, S., 2013. The impact of liquidity management on the profitability of banks in Nigeria. *Journal of Finance and Bank Management* 1(1), 37-48.
- Khan, S., 2022. Determinants of banks profitability: Evidence from GCC countries. *Journal of Central Banking Theory and Practice* 11(3), 99-116.
- Khati, P., 2020. Impact of liquidity on profitability of Nepalese commercial banks. *IOSR Journal of Economics and Finance* 11(5), 26-33.
- Malik, M. S., M. Awais, and A. Khursheed, 2016. Impact of liquidity on profitability: A comprehensive case of Pakistan's private banking sector. *International Journal of Economics and Finance* 8(3), 69-74.
- Malik, M. U., and M. Aqeel, 2017. Impact of liquidity management on profitability in the Pakistani Commercial Banks. *American Based Research Journal* 6(11), 1-10.
- Mohanty, B., and S. Mehrotra, 2018. The effect of liquidity management on profitability: A comparative analysis of public and private sector banks in India. *IUP Journal of Bank Management* 17(1), 7-20.
- O'Connell, M., 2023. Bank-specific, industry-specific and macroeconomic determinants of bank profitability: evidence from the UK. *Studies in Economics and Finance* 40(1), 155-174.
- Ongore, V. O., and G. B. Kusa, 2013. Determinants of financial performance of commercial banks in Kenya. *International Journal of Economics and Financial Issues* 3(1), 237-252.
- Pandey, C., and R. K. Budhthoki, 2020. Impact of liquidity on the profitability of the commercial banks of Nepal. *Pravaha* 26(1), 39-44.

- Quoc Trung, N. K., 2021. Determinants of bank performance in Vietnamese commercial banks: an application of the CAMELS model. *Cogent Business and Management* 8(1), 197-209.
- Saeed, M. S., 2014. Bank-related, industry-related and macroeconomic factors affecting bank profitability: A case of the United Kingdom. *Research Journal of Finance and Accounting* 5(2), 42-50.
- Shah, M. H., and S. Khan, 2017. Factors effecting commercial banks profitability in Pakistan. *Journal of Business and Tourism* 3(1), 1-12.
- Solanki, H., and J. Aggarwal, 2022. Impact of bank specific variables on financial performance of private sector bin India. *International Journal of Multidisciplinary* 7(1), 70-81.
- Sumathy, M., and T. P. Jisha, 2022. Monetary policy and profitability of bank; with special reference to State Bank of India. *RVIM Journal of Management Research* 14(1), 36-40.
- Zaharum, Z., R. A. Latif, M. A. M. Isa, and M. H. Hanafi, 2022. The influence of liquidity management on banks' profitability. *Sciences* 12(6), 820-829.

Chapter 25

Relationship between interest rate change and banks profitability: A case of Nepalese commercial banks

- Rabina Thapa and Sumit Pradhan*

Abstract

This study examines the impact of interest rate changes on the profitability of Nepalese commercial banks. Return on assets (ROA) and return on equity (ROE) are the selected dependent variables. The selected independent variables are spread rate, lending rate, inflation rate, base rate, deposit rate, and exchange rate. The study is based on secondary data of 13 commercial banks with 117 observations for the study period from 2014/15 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of interest rate changes on profitability of Nepalese commercial banks.

The study showed that interest rate spread has a positive impact on return on assets. It indicates that increase in interest rate spread leads to increase in return on assets. Similarly, deposit rate has a negative impact on return on assets and return on equity. It indicates that increase in deposit rate leads to decrease in return on assets and return on equity. In contrast, lending rate has a negative impact on return on assets and return on equity. It indicates that increase on lending rate leads to decrease in return on assets and return on equity. Further, base rate has a negative impact on return on assets and return on equity. It indicates that increase in base rate leads to decrease in return on assets and return on equity. In addition, exchange rate has a positive impact on return on assets and return on equity. It indicates that increase in exchange rate leads to decrease in return on assets and return on equity. Moreover, inflation has a negative impact on return on assets. It indicates that increase in inflation leads to decrease in return on assets.

Keywords: spread rate, lending rate, inflation rate, base rate, deposit rate, return on assets, return on equity

1. Introduction

A healthy and sustainable profitability is important in maintaining the stability of the banking system for sustainable growth in general (Tafri *et al.*, 2009). Profitability ensures that banks have sufficient capital reserves to absorb losses and maintain stability, especially during economic downturns or financial crises. This helps prevent bank failures and systemic risks that could destabilize the entire financial system. Profitable banks are better positioned to invest in risk management practices, such as implementing robust credit assessment procedures, maintaining adequate liquidity reserves, and diversifying their asset portfolios. This helps mitigate risks and reduces the likelihood of bank insolvency. The strong profitability of a bank shows a higher capacity to earn profit and bigger contribution to the economic growth (Adiatmayani and Panji, 2021). Banking and financial firms are highly concerned with interest rate spreads, as these margins enable them to generate profits. The financial institution is anticipated to enhance either the projected returns or the anticipated usefulness of returns, contingent upon market trends and related risk management strategies. This is predicated on the anticipated market trends, wherein the constituents of the electorate's interest distribution fluctuate. The interest rate spread will be influenced by the loan rate variance when there is commercial power in the primary market and a competitive deposit rate. Interest rate spreads are a primary concern for banks and financial institutions, as they enable banks to generate returns. Contingent upon market trends and risk management, the financial institution is anticipated to optimize either projected profits

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or the anticipated usefulness of earnings. The elements of the interest spread fluctuate based on the anticipated market trends. The interest rate spread is influenced by fluctuations in the loan rate dictated by market authority in the primary market and a competitive deposit rate. Wulandari and Harjito (2022) defined interest as the cost incurred by a borrower for utilizing another's capital, relative to the benefits obtained over a specified duration. Interest rates significantly influence individuals' decision-making regarding loans or credit and the placement of funds in bank accounts (Leasiwal and Honoeboen, 2023). In assessing business performance through ROE and ROA metrics, the focus is on the stability of the economic system, particularly concerning fluctuating inflation and exchange rates.

Hanweck and Ryu (2005) posited that bank portfolios linked to the net interest margin are particularly susceptible to fluctuations in interest rates. Garcia-Herrero et al. (2009) examined determinants of diminished profitability in Chinese banks by utilizing data from 87 institutions between 1997 and 2004. The study estimated that profitability is favorably affected by equity relative to assets, deposits relative to assets, interest rates, and inflation. Ejem and Ogbonna (2020) investigated the financial conditions index in relation to inflation and economic development in Nigeria. In constructing the financial conditions index, the variables considered included the Treasury Bills rate, exchange rate, stock market index, credit to the private sector, and interest rate spread. Among other findings, the study concluded that the developed financial conditions index possesses limited predictive capability for inflation and growth. Khawaja and Musleh (2007) that a rise in interest rates infuriate borrowers as well as depositors, such as investment and savings. The study also states that bank profits usually increase with the upspring interest rates. Banks generate inclusive spreads by charging high interest rates to borrowers and giving very low returns to depositors, which deter depositors.

Kibe (2003) examined the correlation between profitability and interest rate spreads in Kenyan commercial banks, asserting that such spreads will cease to be the primary revenue source for these institutions. Consequently, commercial banks will rely less on their traditional intermediary functions and increasingly on innovative, value-added methods for revenue generation through fees. Okech (2013) explored the impact of lending interest rates on the financial performance of commercial banks in Kenya, concluding that a favorable relationship exists between lending interest rates and the financial health of these banks. Maina (2015) further analyzes the influence of lending interest rates on the financial performance of Kenyan commercial banks, indicating that lending rates positively affect their profitability.

Kenduiwa (2018) analyzed the effect of variable lending interest rates on the financial performance of commercial banks in Kenya. The study revealed a strong and positive correlation between fluctuations in lending interest rates and the financial health of these banks. Nahang and Araghi (2013) investigated the internal factors that affect the profitability of City Banks. The results showed that there is a negative and statistical relationship between the profitability of bank and deposit rate. Ahmed (2015) examined the effect of foreign exchange disclosure on financial performance using commercial banks in Kenya. In the study, interest rates positively affect the performance of commercial banks insignificantly. The disclosure of foreign exchange negatively influences the performance of listed commercial banks in Kenya. Lastly, inflation negatively affects bank performance. Were and Wambua (2013) examined the effect of interest rate spread on profits of commercial banks in Kenya. From this examination, ROA and ROE of commercial banks in Kenya were significantly improved through alterations in base rate and lending rate. Exchange rates and inflation indicated a varying effect, which was that the high rates of inflation damage profitability. An extremely crucial variable which was ascertained as vital in reaching a decision on profitability was the spread rate. Alhassan and Asare (2016) investigated the determinants of profitability of Ghanaian commercial banks. The study shows that high inflation and adverse exchange rate negatively influenced profitability while a rise in base rate

and a change in lending rate positively influenced Ghanaian commercial banks ROA and ROE. Spread rate was found to be one of the prominent variables that determined profitability while deposit rate was less influential.

Ghasemi and Rostami (2015) investigated the spread rate and profitability in Nigeria's commercial banks. The study determined that the spread rate, base rate, and loan rate were positively correlated with the ROA and ROE of these banks. Conversely, it was found that bank profitability was adversely affected by inflation and currency fluctuations, as indicated by decreased ROA and ROE. Ghosh (2016) analyzed the effects of regulations, profitability, and cost efficiency on Indian banks. The base rate and lending rate were identified as positively influencing ROA and ROE in Indian commercial banks. Hancock (1985) examined the competitiveness and market pattern in the banking sector of South Africa. The result shows, that the interest rate spread has a positive effect on ROA and ROE of commercial banks in South Africa. Although a wider spread between lending and deposit rates is associated with gains, high inflation has been proven to deter profitability as does change in exchange rate. Akther et al. (2023) examined forces affecting bank profitability based on data of Bangladeshi commercial banks. Results of the analysis indicated that the increasing base and lending rate positively influenced ROA and ROE for Bangladeshi commercial banks. The study also found that while the deposit rate had some positive effect, the inflation and fluctuation within the exchange rate negatively impacted profitability. He and Wang (2012) considered China's liberalization of interest rates to outline its reform and impacts on bank profitability. According to the study, higher lending rates along with a wide spread rate have a positive effect on both ROA and ROE in Chinese commercial banks. Alternatively, the study also showed that the negative exchange rates and high rates of inflation actually have a negative impact on profitability.

In Nepalese context, Lama and Shrestha (2018) assessed the effects of interest rate variability on the financial performance of Nepalese commercial banks, revealing that both the lending rate and spread rate positively influence ROA and ROE, while the deposit rate adversely affects them. Additionally, exchange rate volatility enhances profitability for banks with significant foreign exchange exposure. Likewise, Shrestha and Chaurasiya (2023) examined the impact of liquidity management and profitability of joint venture commercial banks in Nepal. The result showed that there is an insignificant impact of credit to deposit ratio, capital adequacy ratio, and cash reserve ratio on return on assets of joint venture commercial banks in Nepal.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of interest rate changes on profitability of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of interest rate changes on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of spread rate, lending rate, inflation rate, base rate, deposit rate, and exchange rate with profitability of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 13 Nepalese commercial

banks for the study period from 2014/15 to 2022/23, leading to a total of 117 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	No. of observation
1	Agricultural Development Bank Limited	2014/15– 2022/23	9
2	Citizens Bank International Limited	2014/15 – 2022/23	9
3	Everest Bank Limited	2014/15 – 2022/23	9
4	Himalayan Bank Limited	2014/15 – 2022/23	9
5	Machhapuchchhre Bank Limited	2014/15– 2022/23	9
6	Nepal Bank Limited	2014/15– 2022/23	9
7	NMB Bank Limited	2014/15 – 2022/23	9
8	Prabhu Bank Limited	2014/15- 2022/23	
9	Prime Commercial Bank Limited	2014/15 – 2022/23	9
10	Rastriya Banijya Bank Limited	2014/15 – 2022/23	9
11	Sanima Bank Limited	2014/15 – 2022/23	9
12	Siddhartha Bank Limited	2014/15 – 2022/23	9
13	Standard Chartered Bank Nepal Limited	2014/15 – 2022/23	9
Total number of observations			117

Thus, the study is based on the 117 observations.

The model

The model used in this study assumes that profitability depends upon interest rate changes. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are spread rate, lending rate, inflation rate, base rate, deposit rate, and exchange rate. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 SR + \beta_2 LR + \beta_3 IR + \beta_4 ER + \beta_5 BR + \beta_6 DR + e_{it}$$

$$ROE = \beta_0 + \beta_1 SR + \beta_2 LR + \beta_3 IR + \beta_4 ER + \beta_5 BR + \beta_6 DR + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

SR = Spread rate as measured by the weighted average interest rate spread, in percentage.

LR = Lending rate as measured by the ratio of interest revenue to total loans, in percentage.

IR = Inflation rate as measured by the percentage change in the Consumer Price Index, in percentage.

ER = Exchange rate as measured by the conversion of one dollar into Nepalese Rupees, expressed in Rs.

DR = Deposit rate as measured by the proportion of interest rate to total deposits, in percentage.

BR = Base rate, in percentage.

The following section describes the independent variables used in this study along with hypothesis formulation.

Spread rate

Interest rate spread is a key determinant of a financial institution's profitability. Maigua and Mouni (2016) examined the interest rate and its impact on the performance of commercial banks. The interest rate is positively and directly correlated with bank profitability, according to the study. The more the interest rates imposed by banks on their clients, the higher their profits, and conversely. Poudel (2018) examined the impact of interest rate spread on profitability. The study indicates that the interest rate spread and the profitability of commercial banks in Nepal are positively correlated. Khan et al. (2014) examined the impact of interest rate volatility on profitability. The study revealed that bank profitability is favorably affected by interest rates. The bank's profitability is contingent upon the interest rate spread. Jui et al. (2020) examined the identical correlation between interest rate volatility and profitability. The results showed a positive correlation between interest rate spread and the profitability of commercial banks. Bonga (2016) examined the determinants influencing the interest rate spreads of commercial banks in Zimbabwe. The study concluded that the interest rate spread significantly affects banks' profits. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between spread rate and bank's profitability.

Inflation

The inflation rate is the pace at which the average prices of goods and services in an economy increase over a certain time, typically given as a percentage. As inflation increases, the buying power of money diminishes, resulting in a certain amount of currency acquiring fewer goods and services. Akpoviro and Owotutu (2018) examined the impact of external business environment on organizational performance. The findings demonstrate a negative correlation between the inflation rate and bank profitability. Cetin (2019) examined the relationship between bank profitability and inflation utilizing panel data derived from G20 nations. The study revealed that inflation exerted a consistent negative impact on the return on assets of banks in advanced countries. Wamucii (2010) investigated the correlation between inflation and the financial performance of commercial banks in Kenya. The findings demonstrate a negative correlation between inflation and bank performance. The study by Umar et al. (2019) provides an analytical examination of the impact of inflation on bank performance. The study showed that inflation has been shown to negatively impact the banking sector's performance, with its detrimental impacts posing significant risks to the whole economy. Rasheed et al. (2021) examined the impact of currency rates and inflation on the profitability of financial institutions. The ROA is significantly adversely impacted by inflation. Amarasena and Peiris (2021) examined the impact of inflation on the performance of banks in Sri Lanka. The findings indicated that inflation rate has a negative correlation with bank performance. Based on it, this study develops the following hypothesis:

H_2 : There is a negative relationship between inflation and bank's profitability.

Deposit rate

It is the interest rate that a bank or financial institution compensates depositors for maintaining their funds in savings accounts, fixed deposits, or other deposit types. Haddawee and Flayyih (2020) examined the influence of deposit levels on the financial performance of commercial banks. The regression study indicates a substantial positive correlation between ROE and the deposits ratio. Drechsler et al. (2017) investigated the deposit channel of monetary policy. The study determined that a competitive deposit rate is enhancing the earnings of US banks. The bank's larger deposit base, resulting from elevated deposit rates, facilitates more financing for valuable lending and investment activities. Altunbas et al. (2009) examined the bank lending channel and securitization. Increased deposit rates in the Eurozone correlate with enhanced bank profitability. The study indicates that banks may expand their deposit base through attractive deposit rates, which often serve as a reliable and cost-effective source of lending money, hence enhancing profitability. Havrylchuk (2010) analyzed the influence of foreign bank presence on lending costs in transition economies. The study conducted by Asian banks indicates that higher deposit rates correlate with increased profitability. This enables banks to attract additional deposits, which they may subsequently lend and invest in other ventures to enhance their profitability. Andries and Billon (2016) examined the influence of deposit insurance on the discipline of the European banking industry. The study indicates that elevated deposit rates may enhance the profitability of banks in African economies. By providing appealing deposit rates, banks may expand their client base and raise deposit volumes, which serve as more economical sources of cash for lending and enhancing profitability. Based on it, this study develops the following hypothesis:

H_3 : There is a positive relationship between deposit rate and bank's profitability.

Lending rate

The lending rate is the interest rate imposed by a particular lender, whether a bank or financial organization, on a borrower for the utilization of funds. Berlin and Mester (1998) examined the influence of lending interest rate volatility on the financial performance of banking sector. The findings demonstrated that interest rate volatility is inversely correlated to the financial performance of commercial banks. Borio et al. (2017) analyzed the impact of lending interest rates on the correlation between mortgage financing and financial performance in Kenya's commercial banks. The study showed that the loan interest rate has adverse effects on financial performance, but mortgage financing positively and considerably enhance financial performance. The analysis showed that the loan interest rate moderates the link between mortgage financing and financial performance, whereas the effect of capital sufficiency on financial performance is non-monotonic. Ayieyo (2016) investigated the factors that affect loan choices in several Kenyan commercial banks. The results indicated an inverse link between lending interest rates and the total volume of loans disbursed. Allen et al. (2011) examined Africa's financial system and revealed that high lending rates diminish profitability in banks inside emerging nations. Elevated lending rates diminish loan demand and heighten default risks. These factors diminish the net interest revenue of banks. Albertazzi and Gambacorta (2009) analyzed the relationship between the business cycle and bank profitability. Conversely, fast escalating lending rates suggest that profits are declining, as elevated rates result in a reduced volume of loans issued, accompanied by increased credit risks, hence leading to a negative trajectory in profitability. Hossain and Lee (2016) examined the impact of elevated lending rates on bank profitability. The study indicates that there is a significant increase in lending rates may exert pressure on bank profitability across various Asian nations. Higher lending rates diminish loan disbursements and escalate non-performing

loans, so compromising bank profitability. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between lending rate and bank's profitability.

Exchange rate

The exchange rate is the price at which one currency is exchanged for another. It indicates the exchange rate of one currency for a single unit of another currency. Wulandari and Harjito (2021) examined the effects of interest rate, currency rate, and capital structure on the profitability of state-owned enterprises and private publicly listed banks in Indonesia. The results demonstrated that interest rate, exchange rate, and capital structure favorably and substantially affected banking profitability. Babazadeh and Farrokhnejad (2012) examined the impact of currency fluctuations on the financial efficiency of commercial banks. Altered foreign exchange rates favorably influence the financial efficiency of banks, as evidenced by the returns on asset. Baum et al. (2001) examined the impact of variable currency rates on the performance of financial institutions. The analysis indicated a weak positive link between commercial bank performance and exchange rate volatility. Lagat and Nyandema (2016) analyzed the effects of fluctuations in foreign currency rates on the financial performance of commercial banks listed on the Nairobi Securities currency. The study revealed a robust positive link between foreign exchange rates and financial performance metrics. Yeboah and Takacs (2019) analyzed the financial performance of Kenya's listed commercial banks in relation to fluctuations in exchange rates. The results derived from utilizing return on equity as a performance metric revealed a marginally favorable association. Maralutua and Pulungan (2022) examined the correlation between fluctuations in the currency rate, economic indicators, and the financial performance of multinational corporations in Nigeria. A favorable correlation exists between exchange rate and financial performance. Choi et al. (1992) analyzed the financial performance of listed commercial banks in relation to fluctuations in exchange rates. The results derived from utilizing return on equity as a performance metric revealed a marginally favorable association. Azmi et al. (2022) investigated the correlation between fluctuations in the currency rate, economic indicators, and the financial performance of multinational corporations. The study revealed that there is a favorable correlation exists between exchange rate and financial performance. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between exchange rate and bank's profitability.

Base rate

The base rate, often called the benchmark interest rate, is established by a central bank. Claessens et al. (2018) analyzed the impact of fluctuating interest rates on bank profitability in the Eurozone. Base rate rises appear to positively affect bank profitability in the Eurozone. The elevated base rates significantly enhance the net interest margin, hence increasing the total profitability of the banks. Sharma and Gounder (2020) investigated the evidence from Indian commercial banks about the influence of base rates on bank profitability. The study indicates a favorable correlation between base rate fluctuations and the profitability of Indian commercial banks. An increase in the base rate results in heightened interest revenue for banks, thereby enhancing their profitability. English et al. (2018) analyzed bank profitability and interest rate risk. This study discovered a favorable correlation between enhanced bank profitability and an increased base rate set by the Federal Reserve. This analysis indicates that elevated rates appear to benefit banks, as they may impose greater charges on loans while deposit rates adjust more gradually. Alessandri and Nelson (2015) revealed that increases in base rates are positively correlated to the profitability of UK banks. The research indicates that banks often elevate lending rates more rapidly than borrowing rates, therefore enhancing the profitability of the latter. Garcia and Morillo (2019) analyzed the effects of interest rate variations on bank profitability.

The study indicates that elevated base rates enhance the profitability of banks in Latin America by augmenting net interest revenue. Hsieh and Lee (2020) examined the effects of base rate hikes on bank profitability in the Asia-Pacific region. The study identified a positive correlation between the base rate and bank profitability. Based on it, this study develops the following hypothesis:

H_6 : There is a positive relationship between base rate and bank's profitability.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2014/15 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 13 Nepalese commercial banks for the study period of 2014/15 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are SR (Spread rate as measured by the weighted average interest rate spread, in percentage), LR (Lending rate as measured by the ratio of interest revenue to total loans, in percentage), IR (Inflation rate as measured by the percentage change in the Consumer Price Index, in percentage), ER (Exchange rate as measured by the conversion of one dollar into Nepalese Rupees, expressed in Rs), DR (Deposit rate as measured by the proportion of interest rate to total deposits, in percentage), and BR (Base rate, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.08	3.22	1.56	0.53
ROE	0.89	42.94	15.05	5.92
SR	3.15	4.07	9.28	37.34
INF	4.15	8.36	6.31	1.41
DR	1.01	8.97	4.69	2.09
LR	2.36	14.36	9.85	2.30
BR	4.47	11.78	8.35	1.81
ER	99.18	133.79	114.14	11.52

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficient matrix of dependent and independent variables of 13 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are SR (Spread rate as measured by the weighted average interest rate spread, in percentage), LR (Lending rate as measured by the ratio of interest revenue to total loans, in percentage), IR (Inflation rate as measured by the percentage change in the Consumer Price Index, in percentage), ER (Exchange rate as measured by the conversion of one dollar into Nepalese Rupees, expressed in Rs), DR (Deposit rate as measured by the proportion of interest rate to total deposits, in percentage), and BR (Base rate, in percentage).

Variables	ROA	ROE	SR	INF	DR	LR	BR	ER
ROA	1							
ROE	0.734**	1						
SR	0.019	-0.015	1					
INF	-0.187*	0.003	-0.132	1				
DR	-0.328**	-0.383**	0.050	0.044	1			
LR	-0.039	-0.240**	0.072	0.087	0.645**	1		
BR	-0.193*	-0.329**	0.056	0.048	0.726**	0.500**	1	
ER	-0.535**	-0.475**	-0.079	0.289**	0.376**	0.174	0.327**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that there is a positive relationship between spread rate and return on assets. It indicates that increase in spread rate leads to increase in return on assets. Similarly, inflation has a negative relationship with return on assets. It means that increase in inflation leads to decrease in return on assets. In addition, there is negative relationship between deposit rate and return on assets. It means that increase in deposit rate leads to decrease in return on assets. In contrast, this study shows that there is negative relationship between lending rate and return on assets. It means that increase in lending rate leads to decrease in return on assets. Moreover, there is negative relationship between the base rate and return on assets. It means that decrease in base rate leads to increase in return on assets. Similarly, there is negative relationship between exchange rate and return on assets. It indicates that increase in exchange rate leads to decrease in return on assets.

On the other hand, the result shows that there is a negative relationship between spread rate and return on equity. It indicates that increase in spread rate leads to decrease in return on equity. Similarly, inflation has a positive relationship with return on equity. It means that increase in inflation leads to increase in return on equity. In addition, there is negative relationship between deposit rate and return on equity. It means that increase in deposit rate leads to decrease in return on equity. In contrast, this study shows that there is negative relationship between lending rate and return on equity. It means that increase in lending rate leads to decrease in return on equity. Moreover, there is negative relationship between the base rate and return on equity. It means that decrease in base rate leads to increase in return on equity. Similarly, there is negative relationship between exchange rate and return on equity. It indicates that increase in exchange rate leads to decrease in return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4 and 5. More specifically, Table 4 shows the regression results of spread rate, lending rate, inflation rate, base rate, deposit rate, and exchange rate with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of spread rate, lending rate, inflation rate, base rate, deposit rate, and exchange rate with return on assets of Nepalese commercial banks

The results are based on panel data of 13 Nepalese commercial banks with 117 for the study period from 2014/15 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 SR + \beta_2 LR + \beta_3 IR + \beta_4 ER + \beta_5 BR + \beta_6 DR + e_{it}$ where the dependent variables is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are SR (Spread rate as measured by the weighted average interest rate spread, in percentage), LR (Lending rate as measured by the ratio of interest revenue to total loans, in percentage), IR (Inflation rate as measured by the

percentage change in the Consumer Price Index, in percentage), ER (Exchange rate as measured by the conversion of one dollar into Nepalese Rupees, expressed in Rs), DR (Deposit rate as measured by the proportion of interest rate to total deposits, in percentage), and BR (Base rate, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		IRS	INF	DIR	LIR	BR	ER			
1	1.558 (18.783)**	0.001 (0.12)						0.009	0.539	0.015
2	2.013 (8.965)**		-0.071 (2.037)*					0.026	0.529	4.151
3	1.959601 (16.937)**			-0.084 (3.718)**				0.099	0.509	13.824
4	1.655 (7.554)**				-0.009 (0.414)			0.007	0.538	0.172
5	2.043 (8.824)**					-0.057 (2.106)*		0.029	0.528	4.436
6	4.410 (10.492)**						-0.025 (6.799)**	0.281	0.455	46.227
7	1.9999 (8.645)**	0.003 (0.253)	-0.071 (2.041)*					0.018	0.531	2.091
8	2.340 (9.832)**	0.006 (0.553)	-0.066 (2.005)*	-0.083 (3.695)**				0.117	0.504	6.099
9	1.887 (6.7697)**	0.008 (0.798)	-0.074 (2.297)*	-0.136 (4.777)**	-0.075 (2.889)**			0.170	0.488	6.958
10	1.756 (5.219)*	0.009 (0.835)	-0.075 (2.308)*	-0.151 (4.201)**	-0.074 (2.839)**	-0.026 (0.701)		0.167	0.4895	5.6397
11	3.661 (7.596)**	0.007 (0.733)	-0.027 (0.880)	-0.109 (3.201)**	-0.058 (2.441)*	-0.041 (1.225)	-0.021 (5.093)**	0.319	0.442	10.079

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for spread rate are positive with return on assets. It indicates that spread rate has a positive impact on return on assets. This finding is similar to the finding of Jui et al. (2020). Similarly, the beta coefficients for lending rate are negative with return on assets. It indicates that lending rate has a negative impact on return on assets. This finding is consistent with the finding of Berlin and Mester (1998). Likewise, the beta coefficients for inflation rate are negative with return on assets. It indicates that inflation rate has a negative impact on return on assets. This finding is consistent with the finding of Akpoviroro and Owotutu (2018). Further, the beta coefficients for base rate are negative with return on assets. It indicates that base rate has a negative impact on return on assets. This finding is consistent with the findings of Alessandri and Nelson (2015). In addition, the beta coefficients for deposit rate are negative with return on assets. It indicates that deposit rate has a negative impact on return on assets. This finding is consistent with the finding of Haddawee and Flayyih (2020). Likewise, the beta coefficients for exchange rate are negative with return on assets. It indicates that exchange rate has a negative impact on return on assets. This finding is similar to the findings of Babazadeh and Farrokhnejad (2012).

Table 5 shows the regression results of spread rate, lending rate, inflation rate, base rate, deposit rate, and exchange rate with return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of spread rate, lending rate, inflation rate, base rate, deposit rate, and exchange rate with return on equity of Nepalese commercial banks

The results are based on panel data of 13 Nepalese commercial banks with 117 for the study period from 2014/15 to 2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 SR + \beta_2 LR + \beta_3 IR + \beta_4 ER + \beta_5 BR + \beta_6 DR + e_{it}$

where the dependent variables is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are SR (Spread rate as measured by the weighted average interest rate spread, in percentage), LR (Lending rate as measured by the ratio of interest revenue to total loans, in percentage), IR (Inflation rate as measured by the percentage change in the Consumer Price Index, in percentage), ER (Exchange rate as measured by the conversion of one dollar into Nepalese Rupees, expressed in Rs), DR (Deposit rate as measured by the proportion of interest rate to total deposits, in percentage), and BR (Base rate, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		SR	INF	DR	LR	BR	ER			
1	15.099 (16.475)**	-0.008 (0.054)						0.009	5.949	0.0029
2	14.971 (5.930)**		0.014 (0.036)					0.009	5.949	0.001
3	14.971 (5.930)**			-1.082 (4.446)**				0.139	5.495	19.766
4	21.128 (8.987)**				-0.616 (2.651)**			0.049	5.775	7.027
5	24.062 (9.777)**					-1.077 (3.742)**		0.100	5.617	14.005
6	42.941 (8.878)**						-0.244 (5.794)**	0.219	5.234	33.565
7	42.941 (8.878)**	-0.007 (0.056)	0.015 (0.039)					0.016	5.975	0.002
8	42.941 (8.878)**	-0.033 (0.284)	0.079 (0.216)	-1.090 (4.424)**				0.125	5.540	6.527
9	19.286 (6.071)**	-0.034 (0.290)	0.075 (0.205)	-1.113 (3.430)**	0.032 (0.109)			0.117	5.565	4.855
10	21.107 (5.512)**	-0.029 (0.240)	0.082 (0.224)	-0.899 (2.190)*	0.046 (0.156)	-0.356 (0.854)		0.115	5.571	4.021
11	41.419 (7.443)**	-0.009 (0.086)	0.5897 (1.666)	-0.434 (1.116)	-0.124 (0.453)	-0.196 (0.510)	-0.221 (4.704)**	0.257	5.107	7.676

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Return on equity is the dependent variable.

Table 5 shows that the beta coefficients for spread rate are negative with return on equity. It indicates that spread rate has a negative impact on return on equity. This finding is similar to the finding of Bonga (2016). Similarly, the beta coefficients for lending rate are positive with return on equity. It indicates that lending rate has a positive impact on return on equity. This finding is consistent with the finding of Borio et al. (2017). Likewise, the beta coefficients for inflation rate are negative with return on equity. It indicates that inflation rate has a negative impact on return on equity. This finding is consistent with the finding of Amarasena and Peiris (2021). Further, the beta coefficients for base rate are negative with return on equity. It indicates that base rate has a negative impact on return on equity. This finding is consistent with the findings of English et al. (2018). In addition, the beta coefficients for deposit rate are negative with return on equity. It indicates that deposit rate has a negative impact on return on equity. This finding is consistent with the finding of Altunbas et al. (2009). Likewise, the beta coefficients for exchange rate are negative with return on equity. It indicates that exchange rate has a negative impact on return on equity. This finding is similar to the findings of Azmi et al. (2022).

4. Summary and conclusion

Profitability ensures that banks have sufficient capital reserves to absorb losses and maintain stability, especially during economic downturns or financial crises. This helps prevent bank failures and systemic risks that could destabilize the entire financial system. Profitable banks are better positioned to invest in risk management practices, such as implementing robust credit assessment procedures, maintaining adequate liquidity reserves, and diversifying their asset portfolios. This helps mitigate risks and reduces the likelihood of bank insolvency. The strong profitability of a bank shows a higher

capacity to earn profit and bigger contribution to the economic growth

This study attempts to analyze the impact of interest rate changes on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of spread rate, lending rate, inflation rate, base rate, deposit rate, and exchange rate with profitability of Nepalese commercial banks. The study is based on secondary data of 13 commercial banks with 117 observations for the period from 2014/15 to 2022/23.

The major conclusion of this study is that lending rate, base rate, deposit rate, and exchange rate have negative impact on return on assets and return on equity. It indicates that increase in lending rate, base rate, deposit rate, and exchange rate have negative impact on return on assets and return on equity. However, spread rate has a positive effect on return on assets and negative effect on return on equity. Similarly, inflation rate has a positive effect on return on equity and negative effect on return on assets. Likewise, the study also concluded that exchange rate followed by deposit interest rate is the most influencing factor that explains the changes in the return on assets and return on equity in the context of Nepalese commercial banks.

References

- Adiatmayani, P. I. A., and S. I. B. Panji, 2021. The effect of credit risk and operational risk on profitability with capital adequacy variables as a mediating variable: A study on Indonesian state-owned banks for the period of 2015-2019. *Russian Journal of Agricultural and Socio-Economic Sciences* 7(1), 14-27.
- Ahmed, N., 2018. The effect of the financial crisis on the dynamic relation between foreign exchange and stock returns: Empirical evidence from MENA region. *Journal of Economic Studies* 45(5), 994-1031.
- Akpoviro, K. S., and S. O. Owotutu, 2018. Impact of external business environment on organizational performance. *International Journal of Advance Research and Innovative Ideas in Education*, 4(3), 498-505.
- Akther, T., M. Rahman, and M. M. Rahman, 2023. Factors influencing commercial bank profitability in Bangladesh: a panel data approach. *Future Business Journal* 9(1), 66-74.
- Albertazzi, U., and L. Gambacorta, 2009. Bank profitability and the business cycle. *Journal of Financial Stability* 5(4), 393-409.
- Alessandri, P., and B. D. Nelson, 2015. Simple banking: Profitability and the yield curve. *Journal of Money, Credit and Banking* 47(1), 143-175.
- Alhassan, A. L., and N. Asare, 2016. Intellectual capital and bank productivity in emerging markets: evidence from Ghana. *Management Decision* 54(3), 589-609.
- Allen, F., I. Otchere, and L. W. Senbet, 2011. African financial systems: A review. *Review of Development Finance* 1(2), 79-113.
- Altunbas, Y., L. Gambacorta, and D. Marques-Ibanez, 2009. Securitisation and the bank lending channel. *European Economic Review* 53(8), 996-1009.
- Amarasena, B. W. C. M., and T. U. I. Peiris, 2021. Effect of inflation on Sri Lankan banks' performance: mediation effect of interest income and expenses. *European Journal of Business and Management Research* 6(3), 176-180.
- Andries, A. M., and S. Billon, 2016. The effect of deposit insurance on market discipline in European banking. *Journal of Banking and Finance* 71(1), 138-156.

- Ayieyo, J. O., 2016. Determinants of lending behavior in selected commercial banks in Kenya. *International Journal of Economics, Commerce and Management* 14(9), 767-782.
- Azmi, A., M. Adam, M. Widiyanti, and S. Malinda, 2022. Impact of US dollar exchange rate and inflation on profitability. *International Research Journal of Management, IT and Social Sciences* 9(1), 131-137.
- Babazadeh, M., and F. Farrokhnejad, 2012. Effects of short-run and long-run changes in foreign exchange rates on banks' profit. *International Journal of Business and Management* 7(17), 70.
- Baum, C. F., M. Caglayan, and J. T. Barkoulas, 2001. Exchange rate uncertainty and firm profitability. *Journal of Macroeconomics* 23(4), 565-576.
- Berlin, M., and L. J. Mester, 1998. On the profitability and cost of relationship lending. *Journal of Banking and Finance* 22(6-8), 873-897.
- Bonga, W. G., 2016. An empirical analysis of the determinants of interest rate spreads: A case of commercial banks in Zimbabwe. *Dynamic Research Journals' Journal of Economics and Finance* 2(4), 38-54.
- Borio, C., L. Gambacorta, and B. Hofmann, 2017. The influence of monetary policy on bank profitability. *International finance* 20(1), 48-63.
- Cetin, H., 2019. Inflation and bank profitability: G20 countries banks panel data analysis. *Journal of Risk and Financial Management* 14(7), 307-314.
- Choi, J. J., E. Elyasiani, and K. J. Kopecky, 1992. The sensitivity of bank stock returns to market, interest and exchange rate risks. *Journal of Banking and Finance* 16(5), 983-1004.
- Claessens, S., N. Coleman, and M. Donnelly, 2018. The impact of interest rate changes on bank profitability in the Eurozone. *Journal of Banking and Finance*, 92, 1-15.
- Drechsler, I., A. Savov, and P. Schnabl, 2017. The deposits channel of monetary policy. *Quarterly Journal of Economics*, 132(4), 1819-1876.
- Ejem, C. A., and U. G. Ogbonna, 2020. Financial conditions index and economic performance in Nigeria. *American Finance and Banking Review* 5(1), 62-70.
- English, W. B., S. J. Van den Heuvel, and E. Zakrajšek, 2018. Interest rate risk and bank profitability. *Journal of Monetary Economics* 98(2), 1-15.
- Garcia, M., and D. Morillo, 2019. Impact of interest rate changes on bank profitability: Evidence from Latin America. *Emerging Markets Review*, 38, 287-304.
- Garcia-Herrero, A., S. Gavilá, and D. Santabábara, 2009. What explains the low profitability of Chinese banks? *Journal of Banking and Finance* 33(11), 2080-2092.
- Ghasemi, A., and M. Rostami, 2015. Determinants of interest rate spread in banking industry. *International Journal of Applied Research* 1(9), 338-346.
- Ghosh, A., 2016. Banking sector globalization and bank performance: A comparative analysis of low income countries with emerging markets and advanced economies. *Review of Development Finance* 6(1), 58-70.
- Haddawee, A. H., and H. H. Flayyih, 2020. The relationship between bank deposits and profitability for commercial banks. *International Journal of Innovation, Creativity and Change* 13(7), 226-234.
- Hancock, D., 1985. Bank profitability, interest rates, and monetary policy. *Journal of Money, Credit and Banking*, 17(2), 189-202.
- Hanweck, G. A., and L. H. Ryu, 2005. The sensitivity of bank net interest margins and profitability to credit,

- interest-rate, and term-structure shocks across bank product specializations. *FDIC Working Paper No. 05-02*.
- Havrylchyk, O., 2010. The effect of foreign bank presence on the cost of credit in transition economies. *Journal of Banking and Finance* 34(4), 857-868.
- He, D., and H. Wang, 2012. Dual-track interest rates and the conduct of monetary policy in China. *China Economic Review* 23(4), 928-947.
- Hossain, M., and G. Lee, 2016. High lending rates and their impact on bank profitability: A study of Asian economies. *Journal of Asian Economics* 45(1), 45-59.
- Hsieh, M. F., and C. C. Lee, 2020. Foreign bank lending during a crisis: The impact of financial regulations. *Economic Systems* 44(3), 100-111.
- Jui, S. N., R. H. Sakib, and M. A. Rafsan, 2020. Association between interest rate changes and profitability of commercial banks of Bangladesh. *International Journal of Science and Business* 4(9), 17-37.
- Kenduiwa, E. C., 2018. The effect of lending interest rate fluctuation on financial performance of commercial banks in Kenya. *Banks and Bank Systems* 17(1), 186-195.
- Khan, W. A., M. Shahid, R. Bari, W. Anam, N. Shehzad, and S. Siddique, 2014. Impacts of inflationary trends on banks' performance (large banks segment) in Pakistan. *International Journal of Accounting and Financial Reporting* 4(1), 296-306.
- Khawaja, M. I., and Din, M. U. 2007. Determinants of interest spread in Pakistan. *The Pakistan Development Review* 46(2), 129-143.
- Kibe, M. M., 2003. The relationship between interest rate spread and profitability of commercial banks in Kenya. *International Academic Journal of Procurement and Supply Chain Management* 2(1), 16-33.
- Lagat, C. C., and D. M. Nyandema, 2016. The influence of foreign exchange rate fluctuations on the financial performance of commercial banks listed at the Nairobi Securities Exchange. *British Journal of Marketing Studies* 4(3), 1-11.
- Lama, S., and R. Shrestha, 2018. The role of interest rates in bank profitability: Evidence from Nepal. *Journal of Finance and Banking Studies* 3(2), 35-50.
- Leasiwal, T. C., and B. R. A. Honoebon, 2023. The analysis influence economy growth, labor education level and interest rate on investment in Maluku Province. *International Journal of Social Service and Research* 3(1), 159-169.
- Maigwa, C., and G. Mouni, 2016. Influence of interest rates determinants on the performance of commercial banks in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 6(2), 121-133.
- Maina, M. W., 2015. Determinants of interest rate spread among commercial banks of Kenya. *Research Journal of Finance and Accounting* 7(11), 23-26.
- Maralutua, J. T., and N. A. Pulungan, 2022. Inflation, interest rate, and exchange rate for their effect on profitability and the implications on corporate value: case studies in national banking 2014 until 2019. *Journal of Economics, Finance and Accounting Studies* 4(1), 263-279.
- Nahang, F., and M. K. Araghi, 2013. Internal factors affecting the profitability of City Banks. *International Research Journal of Applied and Basic Sciences* 5(12), 1491-1500.
- Okech, F. O., 2013. The effect of lending interest rates on financial performance of commercial banks in Kenya. *International Journal of Finance and Accounting* 2(1), 19-35.

- Poudel, S. R., 2018. Impact of credit risk on profitability of commercial banks in Nepal. *Journal of Applied and Advanced Research* 3(6), 161-170.
- Rasheed, R., M. N. Ishaq, and H. U. Rehman, 2022. Impact of inflation rate and exchange rate on the profitability of financial institutions: A Panel Data analysis from Pakistan. *Pakistan Journal of Social Research* 4(3), 132-139.
- Sharma, P., and N. Gounder, 2020. The effect of base rate on bank profitability: Evidence from Indian commercial banks. *Indian Journal of Finance and Economics* 12(3), 54-71.
- Shrestha, B., and S. Chaurasiya, 2023. Impact of liquidity management on profitability of joint venture commercial banks in Nepal. *Journal of Business and Economics* 11(1), 131-141.
- Tafri, H., Z. Hamid, M. Meera, and A. Omar, 2009. Impact of financial risks on profitability of Malaysian commercial banks. *International Journal of Social and Human Sciences* 3(1), 1672-1686.
- Umar, M., D. Maijama'a, and M. Adamu, 2014. Conceptual exposition of the effect of inflation on bank performance. *Journal of World Economic Research* 3(5), 55-59.
- Wamucii, J. C., 2010. The relationship between inflation and financial performance of commercial banks in Kenya. *International Academic Journal of Economics and Finance* 3(7), 447-460.
- Were, M., and J. Wambua, 2013. Assessing the determinants of interest rate spread of commercial banks in Kenya: An empirical investigation. *KBA Centre for Research on Financial Markets and Policy Working Paper Series No. 4*.
- Wulandari, D., and A. Harjito, 2021. The effect of interest rates, exchange rates and capital structure on banking profitability of BUMN and Private Go Public in Indonesia. *International Journal of Research in Business and Social Science* 10(3), 338-351.
- Yeboah, M., and A. Takacs, 2019. Does exchange rate matter in profitability of listed companies in South Africa? An empirical approach. *International Journal of Energy Economics and Policy* 9(6), 171-178.

Chapter 26

Financial ratios and prediction of financial distress in Nepalese commercial banks

- Prakash Thagunna*

Abstract

The study examines the financial ratios and prediction of financial distress in Nepalese commercial banks. Z-score and non-performing loan are the selected dependent variables. The selected independent variables are return on assets, return on equity, leverage, capital adequacy ratio, total debt to total equity, total equity to total assets. The study is based on secondary data of 12 commercial banks with 117 observations for the study period from 2014/15 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of financial ratios on the prediction of financial distress of Nepalese commercial banks.

The study showed that return on equity and return on assets have positive effect on Z-score. It indicates that increase in return on equity and return on assets leads to increase in Z-score. Similarly, return on assets has a positive relationship with Z-score. In addition, leverage has a negative effect on Z-score and non-performing loan. It means that increase in leverage leads to decrease in Z-score and non-performing loan. In contrast, capital adequacy ratio has a positive effect on Z-score and non-performing loan. It means that increase in capital adequacy ratio leads to increase in Z-score and non-performing loan. Moreover, total debt to total equity has a negative effect on Z-score. It means that decrease in total debt to total equity leads to increase in Z-score. Similarly, total equity to total assets has a positive effect on Z-score. It indicates that increase in total equity to total assets leads to increase in Z-score.

Keywords: financial distress, return on equity, return on assets, leverage, capital adequacy ratio, total debt to total equity and total equity to total assets, Z-score

1. Introduction

The financial environment of the economy and each bank's success depend greatly on the management of non-performing loans. Commercial banks are vulnerable to borrower default because of the nature of their business. The risk to the bank can be reduced by prudent credit risk assessment and the establishment of sufficient reserves for bad and dubious debts. Nevertheless, the safeguards offer insufficient protection when the amount of non-performing loans (NPLs) is very significant (McNulty et al., 2001). Bank distress indicates systemic risk that impedes the broader economy or financial sector. Financial distress as the act of filing for bankruptcy (Altman and Hotchkiss, 2010). Corporate financial distress is seen as a significant social and economic problem. Along with a significant financial and social cost to the country, it typically results in losses for the shareholders, workers, stockholders, and consumers. Predicting a company's financial trouble with sufficient accuracy and precision has become a major problem in the banking industry. Risk is characterized as everything that has the potential to make it more difficult to accomplish a particular goal. Depending on the kind of risk present in a given scenario, it may be caused by either internal or external causes. Risk is the inevitability of future profits or outcome deviations from expectations. It gauges the degree of risk that investor is willing to accept in order to profit from their investment (Nigam and Boughanmi, 2017).

Banking industry is the catalyst for economic progress in every economy by efficiently allocating resources to units that generate profits and fostering global competitiveness. According to

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Nasieku (2014), banks are the primary source of liquidity in the financial systems and offer an effective system. Despite this, few financial institutions have gone under receivership, liquidated, or collapsed altogether. Higher degrees of financial distress have a detrimental impact on a firm's profitability. The firms experience lower profitability, efficiency, and liquidity when they are in financial crisis. Additionally, financial turmoil can exacerbate profitability issues for businesses by permanently deteriorating cash flow and revenue or operational income. Operating income is predicted to be impacted by financial distress, which also has the potential to shorten the company's duration of insolvency by limiting working capital and raising debt levels. Additionally, the firm's solvency is increased, hence boosting debt service coverage, as a result of the increase in profitability brought about by an increase in the gross profit to total sales ratio. Tan (2012) found that enterprises' profit margins decrease as a result of financial difficulty. Large commercial banks' accounting for non-performing loans contributes to their profit efficiency. The relationship between non-performing loans and banks' profit efficiency is inverse, however it is not statistically significant.

The impact of financial ratios on financial distress circumstances in sub-industrial sector companies listed on the Indonesia Stock Exchange was examined by Restianti and Agustina (2018). Return on equity and profits before interest and taxes as a percentage of total assets are two variables that influence financial distress, according to these findings. Financial institutions are not affected by the current ratio, retained profits to total assets, debt to assets ratio, or total assets turnover when it comes to crisis. Reducing funding from debt is the key to avoiding the company's financial difficulties. A corporation can also lessen or prevent financial trouble by boosting sales and making the most of its assets and equity. For the real estate companies listed on the Indonesia Stock Exchange, Desiyanti et al. (2019) used the Altman Z-score method to determine the effect of financial ratios on financial distress. The results showed that return on equity and working capital ratio significantly reduce Z-Score Altman's financial distress, whereas debt equity ratio and current ratio significantly increase it. Financial distress was examined by Indriaty et al. (2019) in relation to financial ratio, local status, and size of the community. The study showed that a number of financial ratios were determined to have a significant impact on financial distress. These ratios included current ratio (CR), debt to equity (D/E), operating revenues to total revenues (OR/TR), return on assets (ROA), and return on equity (ROE). Khaliq et al. (2014) examined GLCs in Malaysia as a case study for identifying financially distressed corporations. The results showed a strong correlation between the two variables and the Z-Scores, which indicate the degree of financial difficulty experienced by the GLC.

Using panel data spanning 2002–03 to 2011–12 and six private commercial banks in Ethiopia, Gebreslassie (2015) evaluated the financial health of these institutions and identified factors unique to each bank that contribute to financial distress. The results showed that financial ratios like capital to loan and net interest income to total revenue have a positive and statistically significant effect on banks' financial health, whereas the nonperforming loan ratio has a negative and statistically significant effect. The effect of financial distress drivers on the long-term viability of commercial banks in Ethiopia was studied by Meher and Getaneh (2019). Based on the results, absolute liquidity risk and net income growth are positively and significantly correlated with return on assets, whereas solvency risk is negatively and significantly correlated with return on assets. In relation to ROE, asset quality is determined to be positive and statistically significant, whereas solvency risk is determined to be negative and statistically significant. In regard to the financial stability index, the solvency risk is negative but considerable, net income risk and asset quality are positive. With a sound bank, there is a positive and statistically significant absolute liquidity risk as well as a negative and statistically significant credit risk. Gunawan and Putra (2021) assessed the relationship between financial stress and corporate governance practices and financial performance. Financial distress in Indonesia and Malaysia was shown to be influenced negatively by liquidity, activity, and likelihood. While financial difficulty

was unrelated to leverage, audit committee, and board of directors in Indonesia, it was significant in Malaysia. Furthermore, the level of financial instability in Indonesia and Malaysia varied. In addition, financial distress was impacted differently in Indonesia and Malaysia by factors such as the audit committee, board of directors, activity, liquidity, leverage, and profitability.

Khafid et al. (2019) analyzed the causes of financial distress in Indonesian mining companies. The study analysed what role liquidity, leverage, and management ownership played in the financial difficulties faced by Indonesian mining companies. The results showed that leverage alleviates financial distress. Therefore, management ownership or liquidity has no effect on financial hardship. In addition, there is little evidence that prosperity mitigates the effect of management ownership and leverage on financial hardship. However, the study showed that profitability lessens liquidity's effect on financial distress. The impact of the financial crisis on profitability, leverage, and liquidity was investigated by Susanti et al. (2020) for retail companies listed on the Indonesian Stock Exchange. Profitability, leverage, and liquidity are the major factors that impact financial hardship simultaneously. Moreover, profitability has a positive effect on financial distress, liquidity factors have a negative effect, and leverage variables have a positive effect. Restianti and Agustina (2018) assessed how financial ratios affected the financial distress situations of enterprises in Indonesia's sub industrial sector. In order to compare several financial metrics against financial distress, this study employed current ratio, retained profits to total assets, earnings before interest and tax to total assets, return on equity, debt to assets ratio, and total assets turnover. Profit before interest and taxes and return on equity as a percentage of total assets have significant effect on financial hardship. Nonetheless, the present ratio, retained profits to total assets, debt to assets ratio, and total assets turnover have insignificant effect on the financial distress. The study showed that if the corporation reduces the amount of money it borrows, it won't run into financial problems. In addition, if a business can increase sales and maximize its assets, it may be able to prevent or reduce financial problems.

In the context of Nepal, Panta (2019) assessed the impact of credit risk management on bank performance of Nepalese commercial bank. The study concluded that capital adequacy ratio has a positive impact on banks' performance. In addition, Singh *et al.* (2021) investigated the effect of non-performing loan on profitability in case of empirical evidence from Nepalese commercial banks. The study concluded that non-performing loans have negative impact on profitability. Chhetri (2023) observed credit risk, liquidity risk and profitability in Nepalese commercial banks. The study revealed that CAR has a positive and statistically significant effect on ROE whereas investment ratio has a negative and statistically significant effect on ROE. The study also revealed that capital ratio has a negative and statistically significant effects on ROE, at the same time, capital adequacy ratio, investment ratio, and capital ratio also have significant impact on ROE.

The above discussion shows that empirical evidences vary greatly across the studies on the financial ratios and prediction of financial distress of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the financial ratios and prediction of financial distress in Nepalese commercial banks. Specifically, it examines the relationship of return on equity, return on assets, leverage, capital adequacy ratio, total debt to total equity and total equity to total assets with financial distress of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 12 Nepalese commercial banks for the study period from 2014/15 to 2022/23, leading to a total of 108 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N	Name of the banks	Study Period	Observations
1	Nepal Bank Limited	2014/15-2022/23	9
2	Himalayan Bank Limited	2014/15-2022/23	9
3	Everest Bank Limited	2014/15-2022/23	9
4	NMB Bank Limited	2014/15-2022/23	9
5	Nepal SBI Bank Limited	2014/15-2022/23	9
6	Machhapuchchhre Bank Limited	2014/15-2022/23	9
7	Standard chartered Bank Nepal Limited	2014/15-2022/23	9
8	Sanima Bank Limited	2014/15-2022/23	9
9	Siddhartha Bank Limited	2014/15-2022/23	9
10	Agricultural Development Bank limited	2014/15-2022/23	9
11	Prime Commercial Bank Limited	2014/15-2022/23	9
12	Citizens International Bank limited	2014/15-2022/23	9
Total number of observations			108

Thus, the study is based on 108 observations.

The model

The model used in this study assumes that financial distress depends upon different bank specific factors. The dependent variables selected for the study are Altman Z-score and non-performing loan. Similarly, the selected independent variables are return on equity, return on assets, leverage, capital adequacy ratio, total debt to total equity and total equity to total assets. Therefore, the models take the following forms:

$$ZS = \beta_0 + \beta_1 ROA + \beta_2 ROE + \beta_3 CAR + \beta_4 LEV + \beta_5 TD\backslash TE + \beta_6 TE\backslash TA + e_{it}$$

$$NPL = \beta_0 + \beta_1 ROA + \beta_2 ROE + \beta_3 CAR + \beta_4 LEV + \beta_5 TD\backslash TE + \beta_6 TE\backslash TA + e_{it}$$

ZS= Z-Score as measured by the model proposed by Altman in 1993 as Z-Score= 6.56 X1+ 3.26 X2+ 6.72 X3+ 1.05 X4

Where,

X1= Working capital/total assets

X2= Retained earnings/total assets

X3= EBIT/total assets

X_4 = Market capitalization/total liabilities

NPL = Non-performing loan ratio as measured as the ratio of non-performing loan to total loans, in percentage.

ROA = Return on asset as measured by net profit after tax to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income by total equity, in percentage.

CAR = Capital adequacy ratio as measured as the ratio of total capital to total risk weighted exposure, in percentage.

LEV = Leverage as measured by the amount of total liabilities to total assets, in percentage.

TD/TE = Total debt to total equity as measured by total debt divided by total equity, in percentage.

TE/TA = Total equity to total asset as measured by total equity divided by total asset, in percentage.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Return on assets

A company's profitability indicates how well it creates value for its shareholders. Musyoki and Kadubo (2012) found an inverse impact of credit risk measured by default risk, bad debts cost and cost per loan on financial performance of commercial bank Kenya. Likewise, the inverse influence of credit risk on profitability was also verified by Kaaya and Pastory (2013). The study found a significant inverse relationship of loan provision to nonperforming loans with performance. Furthermore, Almekhlafi (2016) evaluated the impact of credit risk on profitability of commercial bank in Yemen. Using the annual data of six banks from 1998 to 2013, the study observed a significant inverse impact of nonperforming loan on profitability. Furthermore, the study also documented a causal relationship of credit risk with profitability. Based on it, the study develops the following hypothesis:

H_1 : There is a negative relationship between return on assets and financial distress.

Return on equity

ROE is a reliable predictor of a company's ability to generate a return that is worth the risk involved in the investment. Gizaw *et al.* (2015) asserted that non-performing loan (NPL) is the major indicator of commercial banks' credit risk. Moreover, the study concluded that non-performing loan has statistically significant negative effect on profitability measured by ROA. Likewise, Adebisi and Matthew (2015) concluded that there is a significant negative relationship between non-performing loan and return on assets. In addition, Inggawati *et al.* (2018) examined the influence of loan to deposit ratio (LDR), Loan operational compared with income operational, non-performing loan (NPL) toward profitability of bank. The study found that loan to deposit ratio has a negative significant impact on return on assets. The result also revealed that non-performing loan has significant negative impact on return on assets. Likewise, Cetin (2019) found that non-performing loans and return on assets are negatively correlated. Furthermore, Ozurumba (2016) investigated the impact of non-performing loans on the performance of selected commercial Banks in Nigeria. The study found that non-performing loan has a negative impact on return on assets and return on equity. Based on it, the study develops the following hypothesis:

H₂: There is a negative relationship between return on equity and financial distress

Leverage

According to Kalash (2023), there is a positive relationship between leverage and financial distress, indicating that higher leverage increases the likelihood of financial instability in banks. Elevated leverage levels, characterized by a greater reliance on debt relative to equity, amplify financial risk by increasing the burden of fixed obligations such as interest payments (Dirman, 2020). During periods of economic downturns or market volatility, highly leveraged banks are more vulnerable to default as they face greater difficulty meeting their debt obligations. This heightened risk underscores the importance of managing leverage prudently to mitigate financial distress and maintain long-term stability (Giarto and Fachrurrozie, 2020). Based on it, the study develops the following hypothesis:

H₃: There is a positive relationship between leverage and financial distress.

Capital adequacy ratio

A robust capital adequacy ratio indicates that a bank has sufficient capital buffers to absorb losses and withstand economic shocks, enhancing its resilience against financial distress (Torbira and Zaagha, 2016). There is a negative relationship between the capital adequacy ratio (CAR) and the financial distress of banks, implying that a higher CAR reduces the likelihood of financial instability (Buchdadi et al., 2020). This negative relationship shows the importance of maintaining adequate capitalization levels, as it not only ensures regulatory compliance but also provides a safety net during periods of market volatility. Banks with higher CAR are better positioned to safeguard their operations and maintain confidence among stakeholders, thereby reducing the risk of insolvency (El-Ansary et al., 2019). Based on it, the study develops the following hypothesis:

H₄: There is a negative relationship between capital adequacy ratio and financial distress.

Total debt to total equity

According to Gebreslassie (2005), there is a negative relationship between total debt to total equity and the financial distress of banks, indicating that higher debt relative to equity increases the likelihood of financial instability. This relationship highlights the risks associated with excessive reliance on debt financing, as it can strain a bank's ability to meet its financial obligations, particularly during periods of economic stress (Karugu et al., 2018). A high debt-to-equity ratio may limit a bank's financial flexibility, reduce its capacity to absorb shocks, and increase vulnerability to insolvency. Consequently, maintaining a balanced capital structure with prudent levels of debt is essential for minimizing financial distress and ensuring long-term stability (Zaki et al., 2011). Based on it, the study develops the following hypothesis:

H₅: There is a negative relationship between total debt to total equity and financial distress.

Total equity to total assets

According to Restianti and Agustina (2018), there is a negative relationship between total equity to total assets and the financial distress of banks, indicating that a higher proportion of equity relative to total assets reduces the likelihood of financial instability. A strong equity base provides a cushion against potential losses, enhancing the bank's ability to absorb shocks and maintain operational stability during periods of economic uncertainty (Thim et al., 2011). This relationship highlights the importance of maintaining a robust equity structure, as it strengthens the bank's financial resilience,

minimizes reliance on external debt, and reduces vulnerability to insolvency (Supriyanto and Darmawan, 2018). Based on it, the study develops the following hypothesis:

H_6 : There is a negative relationship between total equity to total assets and financial distress.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2014/15 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 12 Nepalese commercial banks for the study period of 2014/15 to 2022/23. The dependent variables are ZS (Z-Score as measured by the model proposed by Altman in 1993) and NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage) and independent variables are ROA (Return on asset as measured by net profit after tax to total assets, in percentage) ROE (Return on equity as measured by the ratio of net income by total equity, in percentage), LEV (Leverage as measured by the amount of total liabilities to total assets, in percentage), CAR (Capital adequacy ratio as measured as the ratio of total capital to total risk weighted exposure, in percentage), TD/TE (Total debt to total equity as measured by total debt divided by total equity, in percentage) and TE/TA (Total equity to total asset as measured by total equity divided by total asset, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
Z-Score	0.66	2.87	1.34	0.36
NPL	0.01	4.93	1.34	1.18
ROE	3.78	91.51	16.69	10.88
ROA	0.47	3.56	1.59	0.53
LEV	0.81	0.96	0.88	0.03
CAR	7.49	22.99	14.10	2.49
TD/TE	4.19	22.03	8.19	2.46
TE/TA	0.04	0.19	0.12	0.02

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficient matrix of dependent and independent variables of 13 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are ZS (Z-Score as measured by the model proposed by Altman in 1993) and NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage) and independent variables are ROA (Return on asset as measured by net profit after tax to total assets, in percentage) ROE (Return on equity as measured by the ratio of net income by total equity, in percentage), LEV (Leverage as measured by the amount of total liabilities to total assets, in percentage), CAR (Capital adequacy ratio as measured as the ratio of total capital to total risk weighted exposure, in percentage), TD/TE (Total debt to total equity as measured by total debt divided by total equity, in percentage) and TE/TA (Total equity to total asset as measured by total equity divided by total asset, in percentage).

Variables	ZS	NPL	ROE	LEV	ROA	CAR	TD/TE	TE/TA
ZS	1							
NPL	-0.164	1						
ROE	0.302**	0.210*	1					
LEV	-0.591**	-0.274**	-0.264**	1				
ROA	0.612**	-0.037	0.629**	-0.447**	1			
CAR	0.635**	0.064	0.312**	-0.727**	0.392**	1		
TD/TE	-0.545**	-0.101	-0.164	0.916**	-0.364**	-0.668**	1	
TE/TA	0.590**	0.283**	0.272**	-0.996**	0.455**	0.727**	-0.916**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that there is a positive relationship between return on equity and Z-score. It indicates that increase in return on equity leads to increase in Z-score. Similarly, return on assets has a positive relationship with Z-score. It means that increase in return on assets leads to increase in return on assets. In addition, there is negative relationship between leverage and Z-score. It means that increase in leverage leads to decrease in Z-score. In addition, this study shows that there is positive relationship between capital adequacy ratio and Z-score. It means that increase in capital adequacy ratio leads to increase in Z-score. Moreover, there is negative relationship between the total debt to total equity and Z-score. It means that decrease in total debt to total equity leads to increase in Z-score. Similarly, there is positive relationship between total equity to total assets and Z-score. It indicates that increase in total equity to total assets leads to increase in Z-score.

On the other hand, the result shows that there is a positive relationship between return on equity and non-performing loan. It indicates that increase in return on equity leads to increase in non-performing loan. Similarly, return on assets has a negative relationship with non-performing loan. It means that increase in return on assets leads to decrease in non-performing loan. In addition, there is negative relationship between leverage and non-performing loan. It means that increase in leverage leads to decrease in non-performing loan. In addition, this study shows that there is positive relationship between capital adequacy ratio and non-performing loan. It means that increase in capital adequacy ratio leads to increase in return on equity. Moreover, there is negative relationship between total debt to total equity and non-performing loan. It means that decrease in total debt to total equity leads to increase in non-performing loan. Similarly, there is positive relationship between total equity to total assets and non-performing loan. It indicates that increase in total equity to total assets leads to increase in non-performing loan.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and the results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of return on equity, return on assets, leverage, capital adequacy ratio, total debt to total equity and total equity to total assets on Z-score.

Table 4

Estimated regression results of return on equity, return on assets, leverage, capital adequacy ratio, total debt to total equity, total equity to total asset on Z-score of Nepalese commercial banks

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15-2022/23 by using the linear regression model and the model is $ZS = \beta_0 + \beta_1 ROA + \beta_2 ROE + \beta_3 CAR + \beta_4 LEV + \beta_5 TD/TE + \beta_6 TE/TA + e_{it}$ where

the dependent variable is ZS (Z-Score as measured by the model proposed by Altman in 1993) and independent variables are ROA (Return on asset as measured by net profit after tax to total assets, in percentage) ROE (Return on equity as measured by the ratio of net income by total equity, in percentage), LEV (Leverage as measured by the amount of total liabilities to total assets, in percentage), CAR (Capital adequacy ratio as measured as the ratio of total capital to total risk weighted exposure, in percentage), TD/TE (Total debt to total equity as measured by total debt divided by total equity, in percentage) and TE/TA (Total equity to total asset as measured by total equity divided by total asset, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		ROE	ROA	LEV	CAR	TD/TE	TE/TA			
1	1.173 (19.13)**	0.010 (3.26)**						0.083	0.346	10.66
2	0.680 (7.75)**		0.415 (7.95)**					0.368	0.287	63.33
3	7.936 (9.07)**			-7.454 (7.45)**				0.343	0.293	56.93
4	0.038 (0.241)				0.092 (8.47)**			0.398	0.281	71.74
5	1.997 (19.52)**					-0.080 (6.69)**		0.291	0.305	44.81
6	0.464 (3.87)**						7.584 (7.53)**	0.342	0.291	56.71
7	0.662 (7.51)**	0.005 (1.39)	0.474 (7.08)**					0.374	0.286	32.99
8	5.254 (5.85)**	0.004 (1.42)	0.349 (5.39)**	-4.972 (5.13)**				0.495	0.257	36.03
9	1.287 (1.04)	0.006 (2.15)*	0.349 (5.83)**	-1.403 (1.15)	0.059 (4.35)**			0.570	0.237	36.42
10	0.565 (0.294)	0.006 (2.04)*	0.349 (5.82)**	-0.479 (0.213)	0.059 (4.31)**	-0.012 (0.48)		0.567	0.238	28.97
11	5.225 (0.598)	0.006 (1.99)*	0.351 (5.82)*	5.100 (0.58)	0.059 (4.31)**	-0.013 (0.55)	4.902 (0.54)	0.564	0.239	24.03

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Z-score is the dependent variable.

Table 4 shows that the beta coefficients for return on equity are positive with Z-score. It indicates that return on equity has a positive impact on Z-score. This finding is similar to the finding of Gizaw *et al.* (2015). Similarly, the beta coefficients for return on assets are positive with Z-score. It indicates that return on assets has a positive impact on Z-score. This finding is consistent with the finding of Almekhlafi (2016). Likewise, the beta coefficients for leverage are negative with Z-score. It indicates that leverage has a negative impact on Z-score. This finding is consistent with the finding of Dirman (2020). Further, the beta coefficients for capital adequacy ratio are positive with Z-score. It indicates that capital adequacy ratio has a positive impact on Z-score. This finding is consistent with the findings of Torbira and Zaagha (2016). In addition, the beta coefficients for total debt to total equity are negative with Z-score. It indicates that total debt to total equity has a negative impact on Z-score. This finding is consistent with the finding of Gebreslassie (2005). Likewise, the beta coefficients for total equity to total assets are positive with Z-score. It indicates that total equity to total assets has a positive impact on Z-score. This finding is similar to the findings of Supriyanto and Darmawan (2018).

Table 5 shows the regression results of return on equity, return on assets, leverage, capital adequacy ratio, total debt to total equity and total equity to total assets on non-performing loan.

Table 5

Estimated regression results of return on equity, return on assets, leverage, capital adequacy ratio, total debt to total equity, total equity to total assets on non-performing loan of Nepalese commercial banks

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15-2022/23 by using the linear regression model and the model is $NPL = \beta_0 + \beta_1 ROA + \beta_2 ROE + \beta_3 CAR + \beta_4 LEV + \beta_5 TD/TE + \beta_6 TE/TA + e_{it}$ where the dependent variable is NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage) and independent variables are ROA (Return on asset as measured by net profit after tax to total assets, in percentage) ROE (Return on equity as measured by the ratio of net income by total equity, in percentage), LEV (Leverage as measured by the amount of total liabilities to total assets, in percentage), CAR (Capital adequacy ratio as measured as the ratio of total capital to total risk weighted exposure, in percentage), TD/TE (Total debt to total equity as measured by total debt divided by total equity, in percentage) and TE/TA (Total equity to total asset as measured by total equity divided by total asset, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		ROE	ROA	LEV	CAR	TD/TE	TE/TA			
1	0.966 (4.70)**	0.023 (2.20)*						0.035	1.162	4.87
2	1.476 (4.08)**		-0.081 (0.377)					0.008	1.188	0.142
3	11.330 (3.32)**			-11.289 (2.99)**				0.066	1.143	8.60
4	0.919 (1.39)				0.030 (0.65)			0.005	1.186	0.433
5	1.743 (4.39)**					-0.048 (1.04)		0.001	1.183	1.09
6	-0.028 (0.06)						11.88 (3.04)**	0.072	1.14	9.24
7	1.634 (4.66)**	0.042 (3.32)**	-0.620 (2.33)*					0.074	1.139	5.26
8	15.769 (4.21)**	0.043 (3.52)**	-1.003 (3.71)**	-15.308 (3.79)**				0.178	1.072	8.74
9	26.385 (4.88)**	0.048 (3.96)**	-1.003 (3.82)**	-24.86 (4.67)**	0.159 (2.65)*			0.224	1.042	8.70
10	52.674 (6.79)**	0.040 (3.52)**	-1.014 (4.19)**	-58.52 (6.46)**	0.148 (2.68)**	-0.425 (4.42)**		0.342	0.95	12.14
11	-21.993 (0.63)	0.038 (3.45)**	-1.049 (4.41)**	-15.510 (0.451)	0.151 (2.79)**	-0.452 (4.75)**	78.544 (2.22)*	0.367	0.941	11.33

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Non-performing loan is the dependent variable.

Table 5 shows that the beta coefficients for return on equity are positive with non-performing loan. It indicates that return on equity has a positive impact on non-performing loan. This finding is similar to the finding of Almekhlafi (2016). Similarly, the beta coefficients for return on assets are negative with non-performing loan. It indicates that return on assets has a negative impact on non-performing loan. This finding is consistent with the finding of Cetin (2019). Likewise, the beta coefficients for leverage are negative with non-performing loan. It indicates that leverage has a negative impact on non-performing loan. This finding is consistent with the finding of Giarto and Fachrurrozie (2020). Further, the beta coefficients for capital adequacy ratio are positive with non-performing loan. It indicates that capital adequacy ratio has a positive impact on non-performing loan. This finding is consistent with the findings of Buchdadi et al. (2020). In addition, the beta coefficients for total debt to total equity are negative with non-performing loan. It indicates that total debt to total equity has a negative impact on non-performing loan. This finding is consistent with the finding of Zaki et al. (2011). Likewise, the beta coefficients for total equity to total assets are positive with non-performing loan. It indicates that total equity to total assets has a positive impact on non-performing loan. This finding is similar to the findings of Restianti and Agustina (2018).

4. Summary and conclusion

Profitability plays a crucial role in ensuring that banks maintain adequate capital reserves to absorb losses and sustain stability, particularly during economic downturns or financial crises.

This resilience helps prevent bank failures and mitigates systemic risks that could jeopardize the stability of the entire financial system. Profitable banks are also better equipped to invest in effective risk management strategies, such as implementing rigorous credit assessment processes, maintaining sufficient liquidity buffers, and diversifying asset portfolios. These measures reduce risks and lower the probability of insolvency. Moreover, strong profitability reflects a bank's enhanced capacity to generate earnings, thereby contributing significantly to economic growth.

This study attempts to analyze the impact of financial ratios on the financial distress of Nepalese commercial banks. The study is based on secondary data of 12 commercial banks with 108 observations for the period from 2014/15 to 2022/23.

The major conclusion of this study is that return on equity, return on assets, capital adequacy ratio and total debt to total equity on Z-score. It implies that return on equity, return on assets, capital adequacy ratio, and total debt to total assets positively contribute to the Z-score, indicating that profitability, capitalization, and equity structure enhance the financial stability of banks. These variables signify sound financial health, strong capital buffers, and efficient resource utilization, which collectively mitigate risks and improve the banks' ability to withstand economic shocks. However, the study showed that leverage and total equity to total assets have negative effect on Z-score in the context of Nepalese commercial banks. Similarly, leverage and total debt to total equity have negative effect on non-performing loan. Likewise, the study also concluded that total equity to total assets followed by leverage is the most influencing factor that explains the changes in the non-performing loan in the context of Nepalese commercial banks.

References

- Adebisi, J. F., and O. B. Matthew, 2015. The impact of non-performing loans on firm profitability: A focus on the Nigerian banking industry. *American Research Journal of Business and Management* 1(4), 1-7.
- Almekhlafi, E., K. Almekhlafi, M. Kargbo, and X. Hu, 2016. A study of credit risk and commercial banks' performance in Yemen: Panel Evidence. *Journal of Management Policies and Practices* 4(1), 57-69.
- Altman, E. I., and E. Hotchkiss, 2010. *Corporate Financial Distress and Bankruptcy: Predict and Avoid Bankruptcy, Analyze and Invest in Distressed Debt*. (John Wiley and Sons, New Jersey).
- Buchdadi, A., X. Nguyen, F. Putra, and S. Dalimunthe, 2020. The effect of credit risk and capital adequacy on financial distress in rural banks. *Accounting* 6(6), 967-974.
- Cetin, H., 2019. The relationship between non-performing loans and selected EU members banks profit abilities. *International Journal of Trade, Economics and Finance* 10(2), 52-55.
- Chhetri, S. B., 2023. Credit risk, liquidity risk and profitability in Nepalese commercial banks. *International Journal of Finance and Commerce* 5(1), 24-31.
- Desiyanti, O. S., W. Soedarmono, and K. Chandra, 2019. The effect of financial ratios to financial distress using Altman Z-score method in real estate companies listed in Indonesia Stock Exchange Period. *Business and Entrepreneurial Review* 19(2) 119-136.
- Dirman, A., 2020. Financial distress: the impacts of profitability, liquidity, leverage, firm size, and free cash flow. *International Journal of Business, Economics and Law* 22(1), 17-25.
- El-Ansary, O., A. El-Masry, and Z. Yousery, 2019. Determinants of capital adequacy ratio (CAR) in MENA region: Islamic vs. conventional banks. *International Journal of Accounting and Financial Reporting* 9(2), 287-313.

- Gebreslassie, E., 2015. Determinants of financial distress conditions of commercial banks in Ethiopia: A case study of selected private commercial banks. *Journal of Poverty, Investment and Development* 13(2) 59-74.
- Gebreslassie, E., 2015. Determinants of financial distress conditions of commercial banks in Ethiopia: A case study of selected private commercial banks. *Journal of Poverty, Investment and Development* 13(2), 59-74.
- Giarto, R. V. D., and F. Fachrurrozie, 2020. The effect of leverage, sales growth, cash flow on financial distress with corporate governance as a moderating variable. *Accounting Analysis Journal* 9(1), 15-21.
- Gizaw, M., M. Kebede, and S. Selvaraj, 2015. The impact of credit risk on profitability performance of commercial banks in Ethiopia. *African Journal of Business Management*, 9(2), 59.
- Gunawan, B., and H. C. Putra, 2021. Determinant of financial distress. *International Journal Multidisciplinary Science* 3(1), 36-44.
- Indriaty, N., D. Setiawan, and Y. A. Pravasanti, 2019. The effects of financial ratio, local size and local status on financial distress. *International Journal of Economics, Business and Accounting Research* 3(01) 38-42.
- Inggawati, V. R., L. Lusy, and Y. B. Hermanto, 2018. The influence of loan to deposit ratio, loan operational of income operational and nonperforming loan toward profitability of Bank Perkreditan Rakyat in Sidoarjo Regency. *International Journal of Scientific and Research Publications (IJSRP)*, 8(11), 510-519.
- Kaaya, I., and D. Pastory, 2013. Credit risk and commercial banks performance in Tanzania: A panel data analysis. *Research Journal of Finance and Accounting* 4(16) 55-62.
- Kalash, I., 2023. The financial leverage–financial performance relationship in the emerging market of Turkey: the role of financial distress risk and currency crisis. *EuroMed Journal of Business* 18(1), 1-20.
- Karugu, C., G. Achoki, and P. Kiriri, 2018. Capital adequacy ratios as predictors of financial distress in Kenyan commercial banks. *Journal of Financial Risk Management* 7(3), 278-283.
- Khafid, M., T. Tusyanah, and T. Suryanto, 2019. Analyzing the determinants of financial distress in Indonesian mining companies. *International Journal of Economics and Business Administration* 7(4), 353-368.
- McNulty, J. E., A. O. Akhigbe, and J. A. Verbrugge, 2001. Small bank loan quality in a deregulated environment: The information advantage hypothesis. *Journal of Economics and Business* 53(3) 325-339.
- Meher, K., and H. Getaneh, 2019. Impact of determinants of the financial distress on financial sustainability of Ethiopian commercial banks. *Banks and Bank Systems* 14(3) 187-203.
- Musyoki, D., and A. S. Kadubo, 2012. The impact of credit risk management on the financial performance of banks in Kenya for the period. *International Journal of Business and Public Management* 2(2), 72-80.
- Nasieku, T., O. R. Togun, and E. M. Olubunmi, 2014. Corporate social responsibility and organizational performance: A theoretical review. *International Journal of Humanities Social Sciences and Education* 1(12) 106-114.
- Nigam, N., and A. Boughanmi, 2017. Can innovative reforms and practices efficiently resolve financial distress? *Journal of Cleaner Production* 140(2), 1860-1871.
- Ozurumba, B. A., 2016. Impact of non-performing loans on the performance of selected commercial banks in Nigeria. *Research Journal of Finance and Accounting*, 7(16), 95-109.
- Panta, B., 2019. Non-performing loans and bank profitability: Study of joint venture banks in Nepal. *International Journal of Sciences: Basic and Applied Research* 4(2), 151-16.
- Restianti, T., and L. Agustina, 2018. The effect of financial ratios on financial distress conditions in sub industrial sector company. *Accounting Analysis Journal* 7(1) 25-33.

- Restianti, T., and L. Agustina, 2018. The effect of financial ratios on financial distress conditions in sub industrial sector company. *Accounting Analysis Journal* 7(1), 25-33.
- Singh, S. K., B. Basuki, and R. Setiawan, 2021. The effect of non-performing loan on profitability: Empirical evidence from Nepalese commercial banks. *The Journal of Asian Finance, Economics and Business* 8(4), 709-716.
- Supriyanto, J., and A. Darmawan, 2018. The effect of financial ratio on financial distress in predicting bankruptcy. *Journal of Applied Managerial Accounting* 2(1), 110-120.
- Susanti, N., I. Latifa, and D. Sunarsi, 2020. The effects of profitability, leverage, and liquidity on financial distress on retail companies listed on Indonesian Stock Exchange. *Jurnal Ilmiah Ilmu Administrasi Publik* 10(1), 45-52.
- Tan, T. K. 2012. Financial distress and firm performance: Evidence from the Asian financial crisis. *Journal of Finance and Accountancy* 11(1) 1-11.
- Thim, C. K., Y. V. Choong, and C. S. Nee, 2011. Factors affecting financial distress: The case of Malaysian public listed firms. *Corporate Ownership and Control* 8(4), 345-351.
- Torbira, L. L., and A. S. Zaagha, 2016. Capital adequacy measures and bank financial performance in Nigeria: A co-integration analysis. *Journal of Finance and Economic Research* 3(1) 15-34.
- Zaki, E., R. Bah, and A. Rao, 2011. Assessing probabilities of financial distress of banks in UAE. *International Journal of Managerial Finance* 7(3), 304-320.

Chapter 27

Role of asset management, operational efficiency and expense management on the performance of Nepalese commercial banks

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Abstract

This study examines the role of asset management, operational efficiency and expense management on the performance of Nepalese commercial banks. Return on assets (ROA) and net interest margin (NIM) are the selected dependent variables. The selected independent variables are total asset turnover ratio, non-performing loans, loan to deposit ratio, employee expenses, staff bonus to employee expenses ratio and operating expense ratio. The study is based on secondary data of 10 commercial banks with 100 observations for the study period from 2013/14 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of asset management, operational efficiency and expense management on the performance of Nepalese commercial banks.

The study showed that total asset turnover ratio has a positive effect on return on assets and net interest margin. It indicates that increase in total asset turnover ratio leads to increase in return on assets and net interest margin. In contrast, non-performing loan has a positive effect on return on assets and net interest margin. It indicates that increase in non-performing loan leads to increase in return on assets and net interest margin. Similarly, loan to deposit ratio has a positive effect on return on assets and net interest margin. It indicates that increase in loan to deposit ratio leads to increase in return on assets and net interest margin. Likewise, employee expenses have a negative effect on return on assets. It indicates that higher the employee expenses, lower would be the return on assets. In addition, staff bonus to employee expenses has a positive effect on return on assets. It indicates that increase in staff bonus to employee expenses leads to increase in return on assets. Moreover, operating expenses ratio has a negative effect on return on assets. It indicates that higher the operating expenses ratio, lower would be the return on assets. Moreover, operating expenses ratio has a positive effect on net interest margin. It indicates that higher the operating expenses ratio, higher would be the net interest margin.

Keywords: total asset turnover ratio, non-performing loans, loan to deposit ratio, employee expenses, staff bonus to employee expenses ratio, operating expense ratio, return on assets, net interest margin

1. Introduction

Financial institutions are very important in the economic growth of a nation as it helps in the easy flow of credit which leads to the investment opportunities in productive sectors. Therefore, the soundness of banking institutions is an essential consideration for financial system stability. The efficient and effective performance of the banking industry over time guarantees the financial stability of any nation. Banks are subject to many risks while conducting their business practices, such as credit risk, operating risk, interest rate risk, regulatory risk, market risk, liquidity risk, insolvency risk, and foreign exchange risk. Banking is about taking and handling the risk, rather than preventing it (Mendoza and Rivera, 2017). Banking is fundamentally about managing risks rather than eliminating them, as banks inherently take on risks to generate profits. These include credit, market, operational, and liquidity risks, which are managed through strategies like credit evaluations, hedging, and liquidity monitoring (Heffernan, 2005). However, risk prevention also plays a vital role, ensuring that banks avoid excessive exposure through measures such as robust internal controls, regulatory compliance, and cybersecurity safeguards. The balance between accepting calculated risks and implementing preventive measures is critical to sustaining profitability and stability. In the modern banking landscape, prevention has

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gained prominence due to heightened regulatory scrutiny, increasing digital threats, and the need to maintain customer trust, especially in combating fraud and operational inefficiencies (Schroeck, 2002). Effective asset management ensures optimal utilization of resources, balancing risks and returns. In banks, it involves managing loans, investments, and other assets to maximize returns while minimizing risks such as non-performing loans. Strong asset management practices improve liquidity, generate sustainable profits, and enhance financial stability, directly impacting the institution's profitability and growth.

Effective expense management enables institutions to optimize their cost structures by identifying and eliminating inefficiencies, which frees up resources for reinvestment into strategic areas. For instance, savings can be directed toward adopting advanced technologies that improve operational efficiency, enhance customer experiences, and mitigate risks. Similarly, funds can be allocated to market expansion efforts, such as opening new branches or introducing innovative financial products, which drive revenue growth. By maintaining a balance between cost control and strategic investment, institutions can ensure sustainable growth, improve competitiveness, and achieve higher returns on equity and assets, strengthening their overall financial performance (Gurbaxani and Whang, 1991). Rusmini *et al.* (2020) examined the impact of loan-to-deposit ratio (LDR) and operating costs to operational income (BOPO) on the profitability of PT BPR Bali Ambassador from 2014 to 2018. The result showed that there is positive and insignificant relationship between the loan to deposit ratio and financial performance. Anggari *et al.* (2020) used a sample of 44 banks to study the effect of capital adequacy ratio, third party fund, loan to deposit ratio, and bank size to profitability in banking companies. The study found out that loan to deposit ratio have positive and insignificant effect on the profitability of banking companies in the Indonesia Stock Exchange. Landjang and Tumiwa (2018) investigated the financial soundness evaluation of selected commercial banks in Indonesia. The study showed a positive relationship between capital to assets ratio, equity to assets ratio, capital adequacy ratio, non-performing loan to loan ratio, and loan to assets ratio with financial soundness. Similarly, Jahan *et al.* (2019) examined the factor affecting financial stability in listed private commercial banks in Bangladesh. The finding postulated that capital to risk weighted assets, non-interest income to non-interest expense, and non-interest income to total revenue have significant positive contribution to uphold financial stability on private commercial banks. Study also found that total debt to total assets ratio have significant but negative consequences on financial stability of private commercial banks. Further, Mekonnen *et al.* (2015) investigated the soundness of Ethiopian banks. The study showed that capital adequacy ratio has a positive relationship with profitability measured by return on assets and negative relationship with return on equity of the banks.

The value of human capital is a key driver of performance. Well-compensated and well-trained employees tend to be more motivated, productive, and committed, which can enhance operational efficiency, customer satisfaction, and ultimately profitability. In the banking sector, for instance, skilled employees can improve service delivery, reduce errors, and foster innovation, directly contributing to financial performance. However, this relationship requires a balanced approach, ensuring that the increase in employee expenses translates into measurable gains in productivity and financial outcomes (Vargas *et al.*, 2016). Syafrizal *et al.* (2023) analyzed the effect of capital adequacy ratio, non performing financing, financing to deposit ratio and operating expenses and operating income on profitability at PT. Sharia Aceh Bank. The results of this study indicated that the capital adequacy ratio partially has no effect, non-performing financing partially has a positive and significant effect, financing to deposit ratio partially has an effect negative and significant. Mehzabin *et al.* (2023) investigated the influence of capital structure as estimated by leverage ratio and long-term debt, operating efficiency and non-interest income on the profitability of the banking industry in 28 countries of Asia. The results of this study showed that that an increase in total debt ratio increases the profit margin of the bank and the

debt financing increases the profitability of the firm. In addition, the findings indicated that lowering the operating expenses and managing of costs effectively can boost the profitability of bank. Furthermore, non-interest income plays a vital role when the interest rates are lower.

Efficient operations lead to cost savings, higher customer satisfaction, and improved productivity, all of which contribute to better financial performance. Uddin (2022) analyzed the influence of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on the profitability of commercial banks in Bangladesh. The study showed that the leverage as measured by the debt-equity ratio (DER) has a negative and insignificant influence on profitability (ROA). Non-performing loan (NPL) has also a negative and insignificant effect on ROA. Higher DER and NPL lower the profitability position of the bank. The study found that the operating efficiency as measured by BOPO ratio has a positive and insignificant impact on ROA. The study revealed that the capital adequacy ratio (CAR) has a positive and significant effect on ROA. Chimkono *et al.* (2016) investigated the effect of non-performing loan ratio and other determinants on the financial performance of commercial banks in the Malawian banking sector. The study found that non-performing loan ratio, cost efficiency ratios and average lending interest rate have a significant effect on the performance of banks in Malawi. Cash reserve ratio variable was positively related to bank performance but was not significant.

In the context of Nepal, Panta (2018) investigated the bank-specific and macroeconomic determinants of non-performing loans as well as its impact on the financial performance the study found that non-performing loans and bank size have a negative and significant impact on return on assets and return on equity. Reshmi (2023) examined the impact of non-performing loan on the profitability of Nepalese commercial banking sector revealed that non-performing loan ratio had negative and statistically significant impact on both return on asset and return on equity. Loan loss provision had negative but insignificant impact on banks profitability (ROA and ROE). Budhathoki and Rai (2018) examined the relationship between a net profit of Nepalese commercial banks with staff expenses and staff bonus showed that natural log of staff expenses has no impact on net profit of the Nepalese commercial banks with low significant coefficient even though they are positively correlate. Bhattarai *et al.* (2023) examined four variables: net profit, staff bonus fund, return on assets, and non-performing loans from the period of 2003/04 to 2021/22. The study used statistical and econometric tools such as summary statistics, association analysis, Johnsen-Fisher and Kao co-integration test, Hausman, Breusch-Pagan, Chow test, and standardized panel fully modified ordinary least square (PFMOLS) method of regression analysis. The study found that staff bonus fund and ROA positively impact the net profit of commercial banks in Nepal. A highly qualified workforce can improve the banks' profitability through efficient operations and better customer services.

The above discussion shows that empirical evidences vary greatly across the studies on the role of asset management, operational efficiency and expenses management on the financial performance of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the role of asset management, operational efficiency and expense management on the financial performance of Nepalese commercial banks. Specifically, it examines the relationship of total asset turnover ratio, non-performing loan, loan to deposit ratio, employee expenses, staff bonus to employee expenses ratio and operating expenses ratio with financial performance of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and

methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 10 Nepalese commercial banks from 2013/14 to 2022/23, leading to a total of 100 observations. The study employed stratified sampling method. Strata was formed on the basis of ownership structure. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	Observations
1	Agricultural Development Bank Limited	2013/14-2022/23	10
2	Everest Bank Limited	2013/14-2022/23	10
3	Citizens Bank International Limited	2013/14-2022/23	10
4	Nepal Bank Limited	2013/14-2022/23	10
5	NMB Bank Limited	2013/14-2022/23	10
6	Standard Chartered Bank Nepal Limited	2013/14-2022/23	10
7	NIC Asia Bank limited	2013/14-2022/23	10
8	Machhapuchchhre Bank Limited	2013/14-2022/23	10
9	Sanima Bank Limited	2013/14-2022/23	10
10	Siddhartha Bank Limited	2013/14-2022/23	10
Total number of observations			100

Thus, the study is based on the 100 observations.

The model

The model used in this study assumes that financial performance depends upon asset management, operational efficiency and expense management. The dependent variables selected for the study are return on assets and net interest margin. Similarly, the selected independent variables are total asset turnover ratio, non-performing loan, loan to deposit ratio, employee expenses ratio, staff bonus to total employee expenses and operating expenses ratio. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 \text{TATR} + \beta_2 \text{NPL} + \beta_3 \text{LDR} + \beta_4 \text{EE} + \beta_5 \text{SBEER} + \beta_6 \text{OER} + e_{it}$$

$$\text{NIM} = \beta_0 + \beta_1 \text{TATR} + \beta_2 \text{NPL} + \beta_3 \text{LDR} + \beta_4 \text{EE} + \beta_5 \text{SBEER} + \beta_6 \text{OER} + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

NIM = Net interest margin as measured by the ratio of net interest income to total assets, in percentage.

TATR= Total asset turnover ratio as measured by dividing a company's net sales by its average total assets, in percentage.

NPL = Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage.

LDR = Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

EE= Employee expenses as measured by the total cost incurred by a company for compensating its employees, Rs. in billion.

SBEER= Staff bonus to employee expenses ratio as measured by dividing the total amount of bonuses paid to employees by the total employee expenses, in percentage.

OER = Operating expenses ratio as measured by the ratio of operating expenses to operating income, in percentage.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Total asset turnover ratio

Hasanuddin (2023) investigated impact of total asset turnover of Bank Negara Indonesia Financial performance. The study found a positive relationship between total asset turnover ratio and bank performance. Similarly, Gunawan *et al.* (2022) concluded that the higher the total asset turnover ratio, higher would be the return on assets. Similarly, Mule *et al.* (2015) assessed the relationship between corporate size, profitability and firm value. The study indicated that there is a positive and significant relationship between firm size and return on equity. Similarly, Kurniawan (2021) investigated the effect of the debt-to-equity ratio, return on assets and total asset turnover on stock returns in Property and Real Estate companies on the IDX. The study revealed that total asset turnover ratio has a positive impact on return on assets. According to Le Thi Kim *et al.* (2021) Total asset turnover has a positive and significant impact on financial performance as measured by return on asset. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between total asset turnover ratio and financial performance.

Non-performing loan

Non-performing loan is measured as the percentage of non-performing loans to total loans to risk weighted assets. Kwashie (2022) showed that the non-performing loans have a negative impact on the measures of financial performance. Likewise, Safitri and Oktavia (2022) found that NPL has a negative and significant effect on ROA. Similarly, Bandara *et al.* (2021) showed that nonperforming loans have negative and significant association with return on assets. Furthermore, Do *et al.* (2020) revealed that non-performing loans have negative impact on the bank's profitability. Furthermore, Altunbas *et al.* (2000) confirmed that there exists a negative relationship between NPLs ratio and performance. Pham (2021) evaluated the impact of NPLs on the profitability of Vietnamese commercial banks. The result indicated that NPLs has a significant and negative correlation with banks' profitability. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between non-performing loan and financial performance.

Loan to deposit ratio

Loan to deposit ratio is measured by the ratio of total loan provided by the banks out of the deposit collected. Abreu and Mendes (2002) found that there is a statistically significant positive relationship between loans to deposits ratio and bank profitability. Similarly, Sharifi and Akhter (2016) found that CDR positively influence public sector bank's financial performance. Likewise, Ulandari *et al.* (2016) found that loan to deposit ratio has a positive effect on profitability. Moreover, Bolek and Wilinski (2012) found that credit to deposit ratio has a positive impact on the profitability. Based on this, this study develops following hypothesis:

H₃: There is a positive relationship between loan-to-deposit ratio and performance of banks.

Employee expenses

The employee expenses ratio is a financial metric that measures the proportion of a company's total operating expenses that are dedicated to employee-related costs. Sejuwal and Koirala (2023) revealed that expense ratio has a significant impact on bank performance. Similarly, Alhaj-Ismail and Adwan (2024) found that there is a positive relationship between employee compensation expense and firm performance. Likewise, Berhani and Sejdini (2016) stated that staff expenses have a positive effect on bank profitability. Moreover, Schiemann and Guenther (2013) stated that employee expenses is positively related to performance as measured by return on assets (ROA). Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between employee expenses and financial performance.

Staff bonus to employee expenses ratio

Staff bonus to total employee expenses ratio is a financial metric used to evaluate the proportion of bonuses paid to employees relative to the total employee-related expenses. Gitau *et al.* (2024) found that employees' facilitative allowances have a positive and significant effect on performance. Likewise, Han and Shen (2007) showed bonus system has positive impacts on firm performance. Similarly, Bhattarai *et al.* (2023) concluded that staff bonus fund has a positive and significant effect on ROA. Similarly, Akomolafe *et al.* (2018) stated that employee benefit and firm performance has a positive and significant influence towards profitability. Likewise, Sakha (2022) stated that employee compensation has a significant effect on financial performance. Furthermore, Budhathoki and Rai (2018) revealed that staff bonuses have positive impact on performance. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between staff bonus to employee expenses ratio and financial performance.

Operating expenses ratio

Operating expenses ratio is measured as the percentage of total operating costs to total operating income. Uddin (2022) revealed that operating efficiency has a negative and insignificant impact on profitability as measured by return on assets (ROA). Likewise, Anggraeni *et al.* (2022) implicated that operational efficiency ratio has a significant negative impact on both profitability. Similarly, Setyowati (2019) showed that operational efficiency has a negative and significant effect on the profitability of Islamic banking. Moreover, Juwita *et al.* (2018) found a negative and significant effect of operational efficiency on ROA. Based on it, this study develops the following hypothesis:

H_6 : There is a negative relationship between operating expenses ratio and financial performance.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2013/14 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 10 Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are TATR (Total asset turnover ratio as measured by the ratio of total operating income to total assets, in percentage) NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), EE (Employee expenses as measured by the total cost incurred by a company for compensating its employees, in billion), SBEER (Staff bonus to employee expenses ratio as measured by the total amount of bonuses paid to employees to total employee expenses, in percentage) and OER (Operating expenses ratio as measured by the ratio of operating expenses to operating income, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.52	3.80	1.67	0.59
NIM	1.87	5.60	3.17	0.73
TATR	2.51	6.68	4.08	0.82
NPL	0.00	5.46	1.17	1.39
LDR	48.92	107.01	81.36	9.84
EE	8.29	9.70	9.10	0.33
SBEER	0.00	54.94	24.81	12.21
OER	23.46	92.67	43.16	10.06

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 10 Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are TATR (Total asset turnover ratio as measured by the ratio of total operating income to total assets, in percentage) NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), EE (Employee expenses as measured by the total cost incurred by a company for compensating its employees, in billion), SBEER (Staff bonus to employee expenses ratio as measured by the total amount of bonuses paid to employees to total employee expenses, in percentage) and OER (Operating expenses ratio as measured by the ratio of operating expenses to operating income, in percentage).

Variables	ROA	NIM	TATR	NPL	LDR	EE	SBEER	OER
ROA	1							
NIM	0.581**	1						
TATR	0.692**	0.946**	1					
NPL	0.217*	0.600**	0.472**	1				
LDR	0.074	0.043	-0.068	0.159	1			
EE	-0.222*	0.325**	0.213*	0.427**	0.234*	1		
SBEER	0.312**	-0.267**	-0.163	-0.540**	-0.078	-0.788**	1	
OER	-0.269**	0.235*	0.108	0.479**	0.016	0.429**	-0.646**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 3 shows that total asset turnover ratio has a positive relationship with return on assets. It indicates that increase in total asset turnover ratio leads to increase in return on assets. Similarly, there is a positive relationship between non-performing loan and return on assets. It indicates that increase in non-performing loan leads to increase in return on assets. In contrast, there is a positive relationship between loan to deposit ratio and return on assets. It indicates that increase in loan to deposit ratio leads to increase in return on assets. Likewise, employee expenses have a negative relationship with return on assets. It indicates that higher the employee expenses, lower would be the return on assets. In addition, staff bonus to employee expenses has a positive relationship with return on assets. It indicates that increase in staff bonus to employee expenses leads to increase in return on assets. Moreover, operating expenses ratio has a negative relationship with return on assets. It indicates that higher the operating expenses ratio, lower would be the return on assets.

Similarly, the result also shows that total asset turnover ratio has a positive relationship with net interest margin. It indicates that increase in total asset turnover ratio leads to increase in return on equity. Similarly, there is a positive relationship between non-performing loan and net interest margin. It indicates that increase in non-performing loan leads to increase in net interest margin. Similarly, there is a positive relationship between loan to deposit ratio and net interest margin. It indicates that increase in loan to deposit ratio leads to increase in net interest margin. Likewise, employee expenses have a positive relationship with net interest margin. It indicates that higher the employee expenses, higher would be the net interest margin. In addition, staff bonus to employee expenses ratio has a negative relationship with net interest margin. It indicates that increase in staff bonus to employee expenses ratio leads to decrease in net interest margin. Moreover, operating expenses ratio has a positive relationship with net interest margin. It indicates that higher the operating expenses ratio, higher would be the net interest margin.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of total asset turnover ratio, non-performing loan, loan to deposit ratio, employee expenses, staff bonus to employee expenses ratio and operating expenses ratio with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of total asset turnover ratio, non-performing loan, loan to deposit ratio, employee expenses, staff bonus to employee expenses ratio and operating expenses ratio with return on assets

The results are based on panel data of 10 commercial banks with 100 observations for the period of 2013/14 to 2022/23 by

using the linear regression model and the model is $ROA = \beta_0 + \beta_1 TATR + \beta_2 NPL + \beta_3 LDR + \beta_4 EE + \beta_5 SBEER + \beta_6 OER + e_{it}$ where the dependent variable is ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage). The independent variables are TATR (Total asset turnover ratio as measured by the ratio of total operating income to total assets, in percentage) NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), EE (Employee expenses as measured by the total cost incurred by a company for compensating its employees, in billion), SBEER (Staff bonus to employee expenses ratio as measured by the total amount of bonuses paid to employees to total employee expenses, in percentage) and OER (Operating expenses ratio as measured by the ratio of operating expenses to operating income, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		TATR	NPL	LDR	EE	SBEER	OER			
1	-0.364 (-1.665)	0.499 (9.492)**						0.474	0.428	90.104
2	1.563 (20.592)**		0.92 (2.203)*					0.037	0.580	4.855
3	2.032 (4.097)**			4.097 (0.732)				0.005	0.592	0.536
4	5.294 (3.296)**				-0.398 (2.257)*			0.40	0.579	5.094
5	1.296 (10.100)**					0.015 (3.251)**		0.088	0.564	10.567
6	2.354 (9.294)**						-0.016 (2.768)*	0.063	0.572	7.663
7	-0.490 (-2.145)*	0.547 (9.264)**	0.060 (1.724)					0.484	0.424	47.444
8	-0.493 (-1.079)	0.547 (9.092)**	0.060 (1.676)	3.892 (0.009)				0.479	0.426	31.303
9	5.715 (5.028)**	0.561 (10.792)**	0.006 (0.176)	0.004 (1.123)	-0.736 (5.824)**			0.612	0.368	40.007
10	0.595 (0.362)	0.512 (10.290)**	0.067 (1.976)*	0.000 (0.111)	-0.181 (1.003)	0.021 (4.057)**		0.666	0.341	40.507
11	1.788 (1.062)	0.502 (10.290)**	0.085 (2.501)*	0.085 (2.501)*	-0.239 (1.344)	0.015 (2.660)*	-0.011 (2.364)*	0.682	0.333	36.335

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for total asset turnover ratio are positive with return on assets. It indicates that total asset turnover ratio has a positive impact on return on assets. This finding is similar to the findings of Kurniawan (2021). Similarly, the beta coefficients for non-performing loan are positive with return on assets. It indicates that non-performing loan has a positive impact on return on assets. This finding is not similar to the findings of Pham (2021) Likewise, the beta coefficients for loan to deposit ratio are positive with return on assets. It indicates that loan to deposit ratio has a positive impact on return on assets. This finding is consistent with the findings of Abreu and Mendes (2002). In addition, the beta coefficients for employee expenses are negative with return on assets. It indicates that employee expenses have a negative impact on return on assets. This finding is consistent with the findings of Berhani and Sejdini (2016). Further, the beta coefficients for staff bonus to employee expenses ratio are positive with return on assets. It indicates that staff bonus to employee expenses ratio has a positive impact on return on assets. This finding is similar to the findings of Bhattarai *et al.* (2023). Moreover, the beta coefficients for operating expenses ratio are negative with return on assets. It indicates that operating expenses ratio has a negative impact on return on assets. This finding is similar to the findings of Setyowati (2019).

Table 5 shows the regression results of total asset turnover ratio, non-performing loan, loan to deposit ratio, employee expenses, staff bonus to employee expenses ratio and operating expenses ratio with net interest margin of Nepalese commercial banks.

Table 5

Estimated regression results of total asset turnover ratio, non-performing loan, loan to deposit ratio, employee expenses, staff bonus to employee expenses and operating expenses ratio with net interest margin

The results are based on panel data of 10 commercial banks with 100 observations for the period of 2013/14 to 2022/23 by using the linear regression model and the model is $NIM = \beta_0 + \beta_1 TATR + \beta_2 NPL + \beta_3 LDR + \beta_4 EE + \beta_5 SBEER + \beta_6 OER + e_{it}$ where the dependent variable is NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are TATR (Total asset turnover ratio as measured by the ratio of total operating income to total assets, in percentage) NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), EE (Employee expenses as measured by the total cost incurred by a company for compensating its employees, in billion), SBEER (Staff bonus to employee expenses ratio as measured by the total amount of bonuses paid to employees to total employee expenses, in percentage) and OER (Operating expenses ratio as measured by the ratio of operating expenses to operating income, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		TATR	NPL	LDR	EE	SBEER	OER			
1	-0.257 (-2.117)*	0.840 (28.777)**						0.893	0.238	828.131
2	2.800 (36.556)**		0.314 (7.430)**					0.354	0.584	55.205
3	2.905 (4.751)**			0.003 (0.430)				0.008	0.731	0.185
4	-3.346 (-1.744)				0.716 (3.396)**			0.096	0.692	11.536
5	3.562 (22.218)**					-0.016 (2.743)**		0.062	0.705	7.526
6	2.432 (7.726)**						0.017 (2.396)*	0.046	0.711	5.743
7	-0.040 (-0.365)	0.757 (26.932)**	0.103 (6.248)**					0.923	0.202	594.275
8	-0.524 (-2.494)*	0.769 (27.826)**	-0.094 (5.705)**	0.005 (2.666)*				0.928	0.195	423.492
9	-1.613 (-2.707)**	0.767 (28.109)**	0.082 (4.767)**	0.005 (2.282)*	0.129 (1.950)*			0.930	0.193	327.836
10	-2.076 (-2.226)*	0.762 (27.013)**	0.088 (4.543)**	0.004 (2.028)*	0.179 (1.755)	-0.002 (0.646)		0.929	0.196	260.744
11	-2.778 (-2.918)**	0.768 (27.839)**	0.088 (4.543)**	0.005 (2.196)*	0.214 (2.124)*	-0.005 (1.693)	0.006 (2.460)*	0.933	0.188	229.976

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Net interest margin is the dependent variable.

Table 5 shows that the beta coefficients for total asset turnover ratio are positive with net interest margin. It indicates that total asset turnover ratio has a positive impact on net interest margin. This finding is similar to the findings of Hasanuddin (2023). Similarly, the beta coefficients for non-performing loan are positive with net interest margin. It indicates that non-performing loan has a positive impact on net interest margin. This finding is not similar to the findings of Altunbas *et al.* (2000). Likewise, the beta coefficients for loan to deposit ratio are positive with net interest margin. It indicates that loan to deposit ratio has a positive impact on net interest margin. This finding is consistent with the findings of Bolek and Wilinski (2012). Further, the beta coefficients for employee expenses are positive with net interest margin. It indicates that employee expenses have a positive impact on net interest margin. This finding is inconsistent with the findings of Sejuwal and Koirala (2023). Moreover, the beta coefficients for staff bonus to employee expenses ratio are negative with net interest margin. It indicates that staff bonus to employee expenses ratio has a negative net interest margin. This finding is not similar to the findings of Gitau *et al.* (2024). Furthermore, the beta coefficients for operating

expenses ratio are positive with net interest margin. It indicates that operating expenses ratio has a positive impact on net interest margin. This finding is not similar to the findings of Anggraeni *et al.* (2022).

4. Summary and conclusion

Commercial banks are important financial intermediaries that play a greater role in economic development of any country. They collect funds from surplus units and provide loan to deficit units earning profit in between those function. During these activities, commercial banks carry a huge risk of loan default and difficulty in payment to depositors which may be affiliated to various factors such as instability in the government, instable economic condition or other bank related factors that may or may not be avoided. These risks may hinder the performance and ultimately the stability of banking system. Commercial banks must analyze the factors that may be associated with their performance to come up with a way to minimize the negative effects so that the overall financial system (in general) and economy (as a whole) will be stable.

This study attempts to analyze the impact of asset management, operational efficiency and expense management on the financial performance of Nepalese commercial banks. The study is based on secondary data of 10 commercial banks with 100 observations for the period from 2013/14 to 2022/23.

The major conclusion of this study is that total asset turnover ratio, non-performing loan, loan to deposit ratio, employee expenses and operating expenses ratio have positive effect on net interest margin of Nepalese commercial banks. The study also showed that employee expenses and operating expenses ratio have negative effect on return on assets of Nepalese commercial banks. Likewise, the study also concluded that total asset turnover ratio followed by staff bonus to employee expenses ratio is the most influencing factor that explains the changes in the return on asset of Nepalese commercial banks. Similarly, the study also concluded that total asset turnover ratio followed by operating expenses ratio is the most influencing factor that explains the changes in net interest margin in the context of Nepalese commercial banks.

References

- Abreu, M., and V. Mendes, 2002. Commercial bank interest margins and profitability. *European Journal of Finance* 2(1), 36-48.
- Akomolafe, L. C. N., G. A. Emerole, and R. S. Dickson, 2018. Impact of employees benefits on organizational performance: A study of selected manufacturing firms in Nigeria. *Nigerian Journal of Management Sciences* 6(2), 1-36.
- Alhaj-Ismael, A., and S. Adwan, 2024. The predictive ability of share-based compensation expense. *Accounting and Business Research* 1(1), 1-34.
- Altunbas, Y., M. H. Liu, P. Molyneux, and R. Seth, 2000. Efficiency and risk in Japanese banking. *Journal of Banking and Finance* 24(10), 1605-1628.
- Anggari, N. L. S., and I. M. Dana, 2020. The effect of capital adequacy ratio, third party funds, loan-to-deposit ratio, bank size on the financial performance in banking companies on IDX. *American Journal of Humanities and Social Sciences Research* 4(12), 334-338.
- Anggraeni, A., B. Basuki, and R. Setiawan, 2022. Factors influencing on bank capital and the financial performance: Evidence of government banks in Indonesia. *The Journal of Asian Finance, Economics and Business* 9(2), 185-191.
- Bandara, H. M. K. S., A. L. M., Jameel, and H. Athambawa, 2021. Credit risk and profitability of banking sector

- in Sri Lanka. *Journal of Economics, Finance and Accounting Studies* 3(1), 65-71.
- Berhani, R., and A. Sejdini, 2016. An empirical evaluation of the determinants of Albanian banks' profitability by focusing on the relationship between bank profitability and staff salary. *International Journal of Economics, Commerce and Management* 4(6), 19-41.
- Bhattarai, G., A. K. Dahal, and P. B. Budhathoki, 2023. Does the staff bonus fund decrease the net profit? Empirical insights from Nepalese Commercial Banks. *Nepal Journal of Multidisciplinary Research* 6(4), 14-28.
- Bolek, M., and W. Wiliński, 2012. The influence of liquidity on profitability of polish construction sector companies. *Financial Internet Quarterly e-Finanse* 8(1), 38-52.
- Budhathoki, P. B., and C. K. Rai, 2018. Staff expenses and its effect on the bank's net profit. *Researcher: A Research Journal of Culture and Society* 3(3), 63-71.
- Chimkono, E. E., W. Muturi, and A. Njeru, 2016. Effect of non-performing loans and other factors on performance of commercial banks in Malawi. *International Journal of Economics, Commerce and Management* 4(2), 549-563.
- Do, H., T. Ngo, and Q. Phung, 2020. The effect of non-performing loans on profitability of commercial banks: Case of Vietnam. *Accounting*, 6(3), 373-386.
- Gitau, A. R. N., R. K. Chepkilot, and S. Kipchumba, 2024. Employees' facilitative allowances on the performance of commercial state corporations in Kenya. *Editon Consortium Journal of Business and Management Studies* 6(1), 37-50.
- Gunawan, R., M. Widiyanti, S. Malinda, and M. Adam, 2022. The effect of current ratio, total asset turnover, debt to asset ratio, and debt to equity ratio on return on assets in plantation sub-sector companies listed on the Indonesia stock exchange. *International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration* 2(1), 19-28.
- Gurbaxani, V., and S. Whang, 1991. The impact of information systems on organizations and markets. *Communications of the ACM* 34(1), 59-73.
- Han, T. S., and C. H. Shen, 2007. The effects of bonus systems on firm performance in Taiwan's high-tech sector. *Journal of Comparative Economics* 35(1), 235-249.
- Hasanuddin, R., 2023. The effect of net profit margin and total asset turnover toward financial performance at Bank Negara Indonesia (PERSERO). In *Proceeding ADRI International Conference on Multidisciplinary Research* 1(1), 176-182.
- Heffernan, S., 2005. *Modern banking* (John Wiley and Sons, New York).
- Jahan, K., M. A. Kabir, and F. N. Saima, 2019. Determinants of financial stability: evidence from listed private commercial banks in Bangladesh. *Daffodil International University Journal of Business and Entrepreneurship* 12(2), 13-28.
- Juwita, S., P. D. J. Raga, F. I. Prasetyo, and E. Rimawan 2018. Effect of CAR (capital adequacy ratio), BOPO (operational costs on operational revenues) and LDR (loan to deposit ratio) to ROA (return on assets) PD Bank Pasar Bogor City. *International Journal of Innovative Science and Research Technology* 3(6), 305-309.
- Kurniawan, A., 2021. Analysis of the effect of return on asset, debt to equity ratio, and total asset turnover on share return. *Journal of Industrial Engineering and Management Research* 2(1), 64-72.
- Kwashie, A. A., S. T. Baidoo, and E. K. Ayesu, 2022. Investigating the impact of credit risk on financial performance of commercial banks in Ghana. *Cogent Economics and Finance* 10(1), 1-15
- Landjang, X. I., and J. Tumiwa, 2018. Financial Soundness Evaluation of Selected Commercial Banks in Indonesia: An Application of Bankometer Model. *Journal of ASEAN Studies on Maritime Issues* 3(5), 28-39.

- Le Thi Kim, N., D. Duvernay, and H. Le Thanh, 2021. Determinants of financial performance of listed firms manufacturing food products in Vietnam: regression analysis and Blinder–Oaxaca decomposition analysis. *Journal of Economics and Development* 23(3), 267-283.
- Mehzabin, S., A. Shahriar, M. N. Hoque, and P. Wanke, 2023. The effect of capital structure, operating efficiency and non-interest income on bank profitability: new evidence from Asia. *Asian Journal of Economics and Banking* 7(1), 25-44.
- Mekonnen, Y., H. Kedir, and M. Shibru, 2015. Soundness of Ethiopian Banks. *International Journal of Finance and Banking Studies* 4(2), 29-37.
- Panta, B., 2018. Non-performing loans and bank the financial performance: Study of joint venture banks in Nepal. *International Journal of Sciences: Basic and Applied Research* 42(1), 151-167.
- Pham, H. N., 2021. How does internal control affect bank credit risk in Vietnam? A Bayesian analysis. *The Journal of Asian Finance, Economics and Business* 8(1), 873-880.
- Reshmi, B., 2023. Non-performing loan and profitability of commercial banks in Nepal. *International Journal of Finance and Commerce* 5(2), 43-50.
- Rusmini, N. M., and A. M. Adiandari, 2020. Effect of loan-to-deposit ratio (LDR) and BOPO on the financial performance on PT BPR Bali Ambassador for the year 2014-2018. *Jurnal Akuntansi Terapan* 1(2), 84-93.
- Safitri, M., and V. Oktavia, 2022. The role of interest rates on the effect of non-performing loans and capital adequacy ratios on banking profitability (case study on conventional commercial banks listed on the Indonesia stock exchange 2016- 2020). *Jurnal Cakrawala Ilmiah* 1(7), 1785-1796.
- Schiemann, F., and T. Guenther, 2013. Earnings predictability, value relevance, and employee expenses. *The International Journal of Accounting* 48(2), 149-172.
- Schroeck, G., 2002. *Risk Management and Value Creation in Financial Institutions* (John Wiley and Sons, New York).
- Sejuwal, N., and K. B. Koirala, 2023. Determinants of profitability of insurance companies in Nepal. *Patan Prospective Journal* 3(2), 88-95.
- Setyowati, N. 2019. Macroeconomic determinants of Islamic banking products in Indonesia. *Economies* 7(2), 53-62.
- Sharifi, O., and J. Akhter, 2016. Performance of banking through credit deposit ratio in public sector banks in India. *International Journal of Research in Management and Technology* 6(4), 14-18.
- Syafrizal, A., Ilham, R. N., and Muchtar, D. 2023. Effect of capital adequacy ratio, non-performing financing, financing to deposit ratio, operating expenses and operational income on profitability at Pt. Bank Aceh Syariah. *Journal of Accounting Research, Utility Finance and Digital Assets* 1(4), 312-322.
- Uddin, M. K. 2022. Effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. *European Journal of Business and Management Research* 7(3), 289-295.
- Ulandari, L. P. E., F. Yudiaatmaja, and W. Cipta, 2016. Pengaruh capital adequacy ratio (CAR), loan to deposit ratio (Ldr) Dan Biaya Operasional Pendapatan Operasional Pada Lembaga Perkreditan Desa Kecamatan Seririt Periode 2012-2014. *Jurnal Manajemen Indonesia* 4(1), 1-18.
- Vargas, N., M. B. Lloria, and S. Roig-Dobón, 2016. Main drivers of human capital, learning and performance. *The Journal of Technology Transfer* 41(1), 961-978.

Chapter 28

Organization characteristics, efficiency, financial regulation and performance of Nepalese commercial banks

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Abstract

This study examines the organization characteristics, efficiency, financial regulation and performance of Nepalese commercial banks. Return on assets and net interest margin are the selected dependent variables. The selected independent variables are bank size, non-performing loans, number of branches, operating efficiency, capital adequacy ratio, cash reserve ratio and loan-to-deposit ratio. The study is based on secondary data of 10 commercial banks with 100 observations for the study period from 2013/14 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of organization characteristics, efficiency, financial regulation and performance of Nepalese commercial banks.

The study showed that bank size has a positive impact on return on assets and net interest margin. It indicates that increase in bank size leads to increase in return on assets and net interest margin. In addition, non-performing loan has a negative impact on return on assets and net interest margin. It indicates that increase in non-performing loan leads to decrease in return on assets and net interest margin. However, number of branches has a positive impact on return on assets and net interest margin. It indicates that increase in number of branches lead to increase in return on assets and net interest margin. Likewise, operating efficiency has a positive impact return on assets and net interest margin. It indicates that higher the operating efficiency, higher would be the return on assets and net interest margin. In addition, capital adequacy ratio has a positive impact on return on assets and net interest margin. It indicates that increase in capital adequacy ratio leads to increase in return on assets and net interest margin. In contrast, cash reserve ratio has a negative impact on return on assets and net interest margin. It indicates that higher the cash reserve ratio, lower would be the return on assets and net interest margin. However, loan to deposit ratio has a positive impact on return on assets and net interest margin. It indicates that higher the loan to deposit ratio, higher would be the return on assets and net interest margin.

Keywords: bank size, non-performing loans, number of branches, operating efficiency, capital adequacy ratio, cash reserve ratio, loan-to-deposit ratio, return on assets, net interest margin

1. Introduction

Banking sector plays a pivotal role as it ensures efficient flow of financial resources from savers to borrowers. Since banks work as a financial intermediary of financial system, efficiency and smooth performance led to economic growth. Therefore, sound performance of commercial banks is what a country needs for healthy economic growth. Globally, the banking sector has undergone significant transformations for the past decades with banks activities and performance being influenced by both internal and external factors. Banks generally contribute to economic growth through their intermediation functions and the financing of economic activities (Unvan and Yakubu, 2020). The high level of profitability describes the good performance of a company, which means that the bank has been operating effectively and efficiently (Langodai and Lutfillah, 2019). Banks are subject to many risks while conducting their business practices, such as credit risk, operating risk, interest rate risk, regulatory risk, market risk, liquidity risk, insolvency risk, and foreign exchange risk. Banking is about taking and handling the risk, rather than preventing (Mendoza and Rivera, 2017). Despite the operating costs of holding a large portfolio of loans, bank profitability should increase with a higher ratio of loans to assets as long as interest rates on loans are liberalized and the bank applies markup pricing. Among

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the different types of risk which are faced by banks, credit risk seems to have more impact on a bank's profitability because a bank's revenue is generated from loans from which interest is derived (Laryea *et al.*, 2016).

The economic progress of a state is hinged on the robustness of the financial segment in general. The banking system, world over is the nucleus of the economy that provides the hub where funds and others economic activities interrelate. The banking sector plays dynamic role in the development and growth of the Nigerian economy by mobilizing savings and channeling them for investment purposes (Petkovski and Kjosevski, 2014). Commercial banks are the most effective way to generate the credit flow of money in markets. There is acute shortage of capital in India. The banks can play an important role in promoting capital formation, in controlling speculation in maintaining a balance between requirements and availabilities and in direct physical resources into desired channels. Commercial banks play an important and active role in the economic development of a country, if the banking system in a country is effective, efficient and disciplined; it brings about a rapid growth in the various sectors of the economy (Saini and Sindhu, 2014).

Alfadhli and Alali (2021) analyzed the effect of bank size on financial performance in the context of Kuwaiti banks. The study indicated a statistically insignificant and inverse relationship between bank asset size and profitability. Conversely, the study indicated a direct and statistically significant relationship between equity held by shareholders and the profitability of banks. Similarly, Lestari *et al.* (2021) examined the determinants of net interest margin on conventional banking in context of Indonesia stock exchange. The study showed that inflation rate, bank size, credit risk, and equity capital have significant impact on net interest margins. The study also showed that loan-to-deposit ratio and management effectiveness have strong favorable impact on net interest margins. Likewise, Gupta and Mahakud (2020) investigated the ownership structure, bank size, capitalization and bank performance. The study revealed that private sector banks are more lucrative than public sector banks. The study also demonstrated that throughout the crisis, the impact of bank size, bank age, labor productivity, and income diversification on the performance of Indian banks are significant. Further, Hossain and Saif (2019) assessed the impact of firm size on financial performance of banking companies in Bangladesh. The study revealed that firm size (total assets, number of employees, and number of branches) has a positive impact on profitability. In addition, Parvin *et al.* (2019) analyzed the effect of liquidity and bank size on the profitability of commercial banks in Bangladesh. The study concluded that loan-to-asset ratio and bank size have positive relationship with return on asset. The study also concluded that deposit-to-asset ratio has a negative impact on return on assets. Moreover, Mesfin and Ram (2019) examined the determinants of net interest margin in selected commercial banks in Ethiopia over the period 2010 to 2017. The study revealed that assets quality, capital sufficiency, bank size, earning ability, liquidity position, management soundness, exchange rate, inflation, and market concentration are major factors that influenced the net interest margin of the banks.

Ali and Ghazali (2018) examined the impact of firm size on profitability: a comparative study of Islamic bank and commercial bank in Pakistan. The study showed that there is a positive relationship between firm size and profitability in commercial banks, but no relationship exists in the context of Islamic banks. Similarly, Islam and Nishiyama (2016) investigated the determinants of bank net interest margins from South Asian countries. The study concluded that liquidity and equity positions, reserve, and total asset ratios have a positive impact on net interest margins, whereas relative bank size, market power, and economic growth have an opposite impact on net interest margin. Likewise, Alnabulsi *et al.* (2023) examined the non-performing loans and net interest margin in the MENA region. The study revealed a positive and significant impact of GDP on bank profitability whereas negative impact of inflation on bank profitability. Further, Uddin (2022) examined the effect of leverage, operating

efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. The study found that operating efficiency ratio has a positive but an insignificant impact on return on assets. The study also found that capital adequacy ratio has a positive and significant impact on return on assets. In addition, Saleh and Winarso (2021) investigated the analysis of credit insights, focusing on the loan-to-deposit ratio and non-performing loans at rural banks in Bandung city. The study revealed a significant but negative impact of non-performing loans on return on assets. Moreover, Brastama and Yadnya (2020) examined the impact of capital adequacy ratio and non-performing loans on profitability. The study indicated a positive impact of capital adequacy ratio on both return on assets and stock prices. Conversely, non-performing loans have a negative impact on return on assets and stock prices. Likewise, Do *et al.* (2020) examined the effect of non-performing loans on profitability of commercial banks: A case of Vietnam in the period of 2008 to 2017. The study stated that loans to deposits rate and the growth of GDP both have positive impact on bank's performance. Further, Alshebmi *et al.* (2020) assessed the non-performing loans and banks profitability: An empirical evidence from the Saudi Arabia banking sector. The study showed a negative and insignificant relationship between nonperforming loans ratio and return on assets ratio.

Akter and Roy (2017) analyzed the impacts of non-performing loan on profitability in context of banking sector of Dhaka stock exchange. The study showed that non-performing loan has a negative impact on net interest margin. Similarly, Jathurika (2018) investigated the impact of branches nationwide on performance of selected listed commercial banks in Srilanka. The study revealed that expansion of branches have significant impact on the performance of commercial bank. Likewise, Liang *et al.* (2013) investigated enhancing bank performance through branches or representative offices in context of European banks. The study revealed that foreign expansion as a branch both dimensions (breadth and depth) have a positive impact on a bank's return on assets. In addition, Anggraeni *et al.* (2022) examined the impact of liquidity, non-performing assets, sensitivity, and efficiency on the profitability and capital of Indonesian state-owned banks. The study revealed that loan-to-deposit ratio exhibited a significant positive impact on profitability. Moreover, Santika (2022) analyzed the effect of operational risk on financial performance in banking industry Indonesia stock exchange (IDX) during period 2016-2020. The study indicated that total operating expenses has a significant impact on financial performance.

Safitri and Oktavia (2022) analyzed the role of interest rates on the effect of non-performing loans and capital adequacy ratios on banking performance. The study revealed that non-performing loan has a negative and significant effects on return on assets (ROA). Similarly, capital adequacy ratio has a positive and significant effects on return on assets (ROA). Likewise, Wu (2020) examined the internal determinants of performance of commercial banks in China using panel data modeling. The study reported that return to assets is positively related to capital adequacy ratio and negatively associated with non-performing loan ratio and bank size. Moreover, Menicucci and Paolucci (2016) assessed the relationship between bank-specific characteristics and performance in European banking sector. The study found that capital adequacy ratio and size have positive impact on financial performance in Europe, while higher asset quality results in lower performance levels. Likewise, Jaouad and Lahsen (2018) examined the factors affecting bank performance in Morocco. The study revealed that bank size is positively and statistically significant with return on assets (ROA). Similarly, Almazari (2014) assessed the impact of internal factors on financial performance in the context of Saudi Arabia and Jordan. The study found that there is a negative correlation between bank size and return on assets.

Kingu *et al.* (2018) examined the impact of non-performing loans on bank's performance. The study revealed that occurrence of non-performing loan is negatively associated with the level of performance in commercial banks in Tanzania. Similarly, Silaban (2017) assessed the effect of capital

adequacy ratio, net interest margin and non-performing loans on financial performance in Indonesia. The study concluded that capital adequacy ratio (CAR) does not have a significant effect on financial performance and non-performing loans (NPL) has a negative impacts on financial performance. Likewise, Anggari and Dana (2020) examined the effect of non-performing loans (NPL) and capital adequacy ratio (CAR) on performance measured by return on assets (ROA) at PT. Bank Central Asia (BCA), TBK. The study found that non-performing loans do not affect the return on assets. However, capital adequacy ratio has a significant impact on return on asset. Similarly, Martiningtiyas and Nitinegeri (2020) assessed the effect of non-performing loans on the performance of banking sector in Indonesia. The study revealed that non-performing loan has a significant and negative influence on performance of bank. Similarly, liquidity ratio and gross domestic product have significant positive influence on performance of bank whereas capital adequacy ratio does not have significant influence on performance of bank. In addition, Djaya and Yanuarti (2021) examined the influence of capital adequacy ratio and non-performing loan on the performance of commercial banks listed on Indonesia stock exchange. The results stated that the capital adequacy ratio and non-performing loan simultaneously affect the performance.

In the context of Nepal, Chalise (2019) examined the impacts of capital adequacy ratio and cost income ratio on the performance of Nepalese commercial banks. The study revealed that capital adequacy ratio has a negative and an insignificant impacts with bank performance measured by return on assets. However, bank size has a positive and an insignificant impact on bank performance. Similarly, Adhikari *et al.* (2020) assessed the impact of bank capital, liquidity, and credit risk on the performance of Nepalese commercial banks. The study stated that liquidity ratio and non-performing loan have negative impacts on return on assets and return on equity. The study also revealed that bank capital has a significant impact on performance of Nepalese commercial banks. Likewise, Budhathoki *et al.* (2020) examined the impacts of liquidity, leverage, and total size on banks' performance. The study revealed that loan to deposit ratio has a negative effect on the bank's return on assets and return on equity. Further, Neupane (2020) found that the performance of Nepalese commercial banks is insignificantly affected by size of the bank, deposit amount, capital base, loan and advances, number of branches and activities relating to off-balance sheet as the internal factors. Similarly, Gnawali (2018) analyzed the non-performing asset and its effects on performance of Nepalese commercial banks. The study found a negative effect of the non-performing loans on return on assets in the context of Nepalese public banks. Moreover, capital adequacy ratio, loan to deposit ratio and loan loss provision have positive relationship with the performance of banks in Nepal. Likewise, Khati (2020) examined the impacts of liquidity on performance of Nepalese commercial banks. The study found that credit to deposit ratio has a positive significant relationship with financial performance.

The above discussion shows that empirical evidences vary greatly across the studies on the organization characteristics, efficiency, financial regulation and performance of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the organization characteristics, efficiency, financial regulation and performance of Nepalese commercial banks. Specifically, it examines the relationship of bank size, non-performing loans, number of branches, operating efficiency, capital adequacy ratio, cash reserve ratio and loan-to-deposit ratio with performance of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 10 Nepalese commercial banks from 2013/14 to 2022/23, leading to a total of 100 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	Observation
1	Nepal SBI Bank Limited	2013/14-2022/23	10
2	Prime Commercial Bank Limited	2013/14-2022/23	10
3	Everest Bank Limited	2013/14-2022/23	10
4	Agricultural Development Bank Limited	2013/14-2022/23	10
5	Sanima Bank Limited	2013/14-2022/23	10
6	Machhapuchchhre Bank Limited	2013/14-2022/23	10
7	Nepal Bank Limited	2013/14-2022/23	10
8	NIC Asia Bank Limited	2013/14-2022/23	10
9	Siddhartha Bank Limited	2013/14-2022/23	10
10	Standard Chartered Bank Nepal Limited	2013/14-2022/23	10
Total number of observations			100

Thus, the study is based on the 100 observations.

The model

The model used in this study assumes that performance depends upon organization characteristics, efficiency and financial regulation. The dependent variables selected for the study are return on assets and net interest margin. Similarly, the selected independent variables are bank size, non-performing loans, number of branches, operating efficiency, capital adequacy ratio, cash reserve ratio and loan-to-deposit ratio. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 BS + \beta_2 NPL + \beta_3 NOB + \beta_4 OE + \beta_5 CAR + \beta_6 CRR + \beta_7 LTD + e_{it}$$

$$NIM = \beta_0 + \beta_1 BS + \beta_2 NPL + \beta_3 NOB + \beta_4 OE + \beta_5 CAR + \beta_6 CRR + \beta_7 LTD + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

NIM = Net interest margin as measured by the ratio of net interest income to total assets, in percentage.

BSIZE = Bank size as measured by total assets, Rs. in billion.

NPL = Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage.

NOB = Number of branches as measured by total number of branches, in numbers.

OE = Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage.

CAR = Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage.

CRR = Cash reserved ratio as measured by the ratio of reserved requirement to total deposit, in percentage

LTD = Loan- to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Bank size

Bank size is measured as the natural logarithm of total assets of the bank (Riaz and Mehar, 2013). Dodi *et al.* (2018) assessed the determinants of profitability of Islamic bank. The study found that bank size has a positive impact on financial performance. Similarly, Parvin *et al.* (2019) analyzed the effect of liquidity and bank size on the performance of seven commercial banks in Bangladesh during the year 2011-2015. The results stated that bank size has a positive relationship with return on asset. Likewise, Ezechukwu and Amahalu (2017) showed that bank size has a positive and statistically significant impact on financial performance. Further, Mbekomize and Mapharing (2017) showed a positive relationship between bank size and financial performance. In addition, Bogale (2019) revealed that bank size is significant and positively related with performance of Ethiopian private commercial banks. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between bank size and performance of banks.

Non-performing loan

Alnabulsi *et al.* (2023) examined the non-performing loans and net interest margin in the Middle East and North Africa (MENA) region. The study found that non-performing loan has a negative and insignificant impact on net interest margin. Similarly, Uddin (2022) investigated the effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. The study showed that non-performing loan has a negative and insignificant impact on return on assets. Likewise, Saleh and Winarso (2021) assessed the analysis of credit insights, focusing on the loan-to-deposit ratio (LDR) and non-performing loans (NPL) at rural banks in Bandung city. The study concluded a significant and negative impact of non-performing loans on return on assets. Further, Brastama and Yadnya (2020) examined the impact of capital adequacy ratio and non-performing loans on banking stock prices. The study indicated a positive impact of the capital adequacy ratio on both return on assets and stock prices. Conversely, non-performing loans have a negative impact on return on assets and stock prices. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between non-performing loan and performance of banks.

Number of branches

Jathurika (2018) investigated the impact of branches nationwide on performance of selected listed commercial banks in Srilanka. The study revealed that expansion of branches has a significant impact on the performance of commercial bank. Similarly, Almazari (2014) examined the impact of the internal factor on bank profitability. The study indicated that there is a significant positive correlation between number of branches and performance of the banks. Likewise, Liang *et al.* (2013) revealed

that for foreign expansion as a branch both dimensions (breadth and depth) have a positive impact on a bank's return on assets. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between number of branches and performance of banks.

Operating efficiency

Udiin and Hossain (2020) investigated the impact of operating expenditures on firm's profitability. The study found that operating expenses have an inverse impact on a firm's profitability. Similarly, Mugun (2019) analyzed the effect of operating expense ratio on financial performance of microfinance institutions in Kenya. The study revealed that operating expense ratio has a negative but significant relationship with return to assets. Likewise, Mun and Jang (2018) found that there is a negative relationship between operating expense and performance of banks. Further, Abel and Le Roux (2016) investigated the determinants of banking sector profitability in Zimbabwe. The study showed that operating expenses has a negative impact on profitability of banking system. In addition, Gill *et al.* (2014) examined the impact of operational efficiency on the future performance of Indian manufacturing firms. The study indicated that operational efficiency has a negative impact on banks' performance. Based on it, this study develops following hypothesis:

H₄: There is a negative relationship between operating expenses and performance of banks.

Capital adequacy ratio

Widyatmoko and Risman (2024) examined the influence of digital finance, capital adequacy, efficiency and asset quality on profitability in foreign ownership moderation. The study found that there is a positive relationship between capital adequacy ratio and profitability. Similarly, Mir and Shah (2022) concluded that there is a significant positive impact of capital adequacy on the performance of the bank. Likewise, Oke and Ikpesu (2022) showed that both capital adequacy and asset quality have a positive impact on performance of banks in Nigeria. Further, Suroso (2022) revealed that capital adequacy ratio has a positive impact on return on assets. In addition, Setiawan and Nupus (2021) indicated that capital adequacy ratio has a positive and significant impact on the profitability. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between capital adequacy ratio and performance of banks.

Cash reserve ratio

Akinleye and Oluwadare (2022) examined the effect of cash reserve requirement on banks' profitability in Nigeria for a period of 10 years, spanning from 2010-2019. The study found that cash reserve ratio exerts a negative but significant impact on return on assets. Similarly, Olagunju and Isiaka (2021) investigated the economic implication of cash reserve requirement on the profitability of deposit money banks in Nigeria over the period of 31 years between 1988 and 2018. The study revealed that cash reserve requirement has an inverse relationship with profitability of banks. Likewise, Hoque *et al.* (2020) examined the impact of monetary policy on the commercial bank's profitability. The study concluded that cash reserve ratio negatively related to return on assets, return on equity as well as return on investment. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between cash reserve ratio and performance of banks.

Loan-to-deposit ratio

Sihotang *et al.* (2022) showed that loan-to-deposit ratio has a positive and significant impact on return on assets. Similarly, Susantih and Ompusunggu (2022) examined the analysis of loan-to-deposit ratio and non-performing loan on profitability. The study showed that loan-to-deposit ratio has

a significant and positive impact on profitability. Likewise, Nugraha *et al.* (2021) indicated that loan-to-deposit ratio has a positive impact on performance of the banking sectors in Indonesia. Further, Amalia (2021) examined the bank's performance in terms of the risk profile, income, and capital aspects of all banks in Indonesia in 2015-2019. The study stated that loan-to-deposit ratio has a significant and positive impact on profitability measured by return on assets. In addition, Haryanto *et al.* (2021) analyzed the effect of loan-to-deposit ratio, credit risk on profitability and net interest margin as moderating variables. The results showed that loan-to-deposit ratio has a positive impact on profitability. Based on it, this study develops following hypothesis:

H₇: There is a positive relationship between loan-to-deposit ratio and performance of banks.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2013/14 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 10 Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are BSIZE (Bank size as measured by total assets, Rs. in billions), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), NOB (Number of branches as measured by total number of branches, in numbers), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CRR (Cash reserved ratio as measured by the ratio of reserved requirement to total deposit, in percentage) and LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.13	3.57	1.64	0.56
NIM	0.22	7.09	3.34	1.29
BS	10.47	11.47	11.06	0.24
NPL	0.00	5.46	1.03	1.41
NOB	28	360	138.92	81.91
OE	25.79	92.67	42.85	10.58
CAR	4.55	23.68	13.97	2.68
CRR	3.49	36.21	19.30	8.16
LTD	57	107.01	79.06	9.06

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 10 Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and NIM (Net interest margin as measured by the ratio of net interest income

to total assets, in percentage). The independent variables are BSIZE (Bank size as measured by total assets, Rs. in billions), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), NOB (Number of branches as measured by total number of branches, in numbers), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CRR (Cash reserved ratio as measured by the ratio of reserved requirement to total deposit, in percentage) and LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage).

Variables	ROA	NIM	BSIZE	NPL	NOB	OE	CAR	CRR	LTD
ROA	1								
NIM	0.349**	1							
BSIZE	0.374**	0.302**	1						
NPL	-0.117	-0.431**	0.175	1					
NOB	0.075	0.046	0.632**	0.431**	1				
OE	0.289**	0.345**	0.111	0.412**	0.308**	1			
CAR	0.357**	0.060	0.195	0.026	0.280**	-0.322**	1		
CRR	-0.096	-0.136	0.026	-0.030	0.191	0.180	0.232*	1	
LTD	0.046	0.076	0.259**	0.192	0.196	-0.026	0.089	0.330**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent respectively.

Table 3 shows that bank size has a positive relationship with return on assets. It indicates that increase in bank size leads to increase in return on assets. In addition, there is a negative relationship between non-performing loan and return on assets. It indicates that increase in non-performing loan leads to decrease in return on assets. However, there is a positive relationship between number of branches and return on assets. It indicates that increase in number of branches lead to increase in return on assets. Likewise, operating efficiency has a positive relationship with return on assets. It indicates that higher the operating efficiency, higher would be the return on assets. In addition, capital adequacy ratio has a positive relationship with return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. In contrast, cash reserve ratio has a negative relationship with return on assets. It indicates that higher the cash reserve ratio, lower would be the return on assets. However, loan to deposit ratio has a positive relationship with return on assets. It indicates that higher the loan to deposit ratio, higher would be the return on assets.

Similarly, the result also shows that bank size has a positive relationship with net interest margin. It indicates that increase in bank size leads to increase in net interest margin. Likewise, there is a negative relationship between non-performing loan and net interest margin. It indicates that increase in non-performing loan leads to decrease in net interest margin. However, there is a positive relationship between number of branches and net interest margin. It indicates that increase in number of branches lead to increase in net interest margin. Likewise, operating efficiency has a positive relationship with net interest margin. It indicates that higher the operating efficiency, higher would be the net interest margin. In addition, capital adequacy ratio has a positive relationship with net interest margin. It indicates that increase in capital adequacy ratio leads to increase in net interest margin. In contrast, cash reserve ratio has a negative relationship with net interest margin. It indicates that higher the cash reserve ratio, lower would be the net interest margin. However, loan to deposit ratio has a positive relationship with net interest margin. It indicates that higher the loan to deposit ratio, higher would be the net interest margin.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of

bank size, non-performing loans, number of branches, operating efficiency, capital adequacy ratio, cash reserve ratio and loan-to-deposit ratio with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of bank size, non-performing loans, number of branches, operating efficiency, capital adequacy ratio, cash reserve ratio and loan-to-deposit ratio with return on assets

The results are based on panel data of 10 commercial banks with 100 observations for the period of 2013/14-2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 BS + \beta_2 NPL + \beta_3 NOB + \beta_4 OE + \beta_5 CAR + \beta_6 CRR + \beta_7 LTD + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage). The independent variables are BSIZE (Bank size as measured by total assets, Rs. in billions), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), NOB (Number of branches as measured by total number of branches, in numbers), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CRR (Cash reserved ratio as measured by the ratio of reserved requirement to total deposit, in percentage) and LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage).

Model	Intercept	Regression coefficients of							Adj. R ²	SEE	F-value
		BSIZE	NPL	NOB	OE	CAR	CRR	LTD			
1	11.426 (4.658)**	0.885 (3.991)**							0.131	0.527	15.928
2	1.591 (22.669)**		-0.047 (1.169)						0.004	0.564	1.367
3	1.628 (14.769)**			0.001 (0.001)					0.006	0.526	0.490
4	2.302 (10.083)**				0.015 (2.990)**				0.074	0.544	8.937
5	0.585 (2.063)*					0.075 (3.785)**			0.119	0.531	14.325
6	1.511 (10.345)**						-0.007 (0.954)		0.001	0.566	0.911
7	1.864 (3.716)**							0.003 (0.452)	0.008	0.568	0.204
8	12.210 (4.990)**	0.963 (4.342)**	-0.076 (2.011)*						0.157	0.519	10.233
9	12.763 (4.331)**	1.030 (3.781)**	-0.060 (1.537)	0.001 (1.131)					0.190	0.407	7.285
10	14.654 (5.406)**	1.131 (4.553)**	-0.106 (2.854)**	0.002 (2.052)*	0.021 (4.370)**				0.307	0.436	10.741
11	14.890 (5.836)**	1.251 (5.214)**	-0.086 (2.421)*	0.001 (1.589)	0.014 (2.950)**	0.077 (3.448)**			0.386	0.410	12.084
12	14.757 (5.728)**	1.251 (5.214)**	-0.900 (2.461)*	0.001 (1.494)	0.015 (2.935)**	0.074 (3.171)**	-0.003 (0.504)		0.381	0.412	10.022
13	14.771 (5.701)**	1.266 (5.153)**	-0.086 (2.248)*	0.001 (1.502)	0.015 (2.706)*	0.074 (3.158)**	-0.002 (0.284)	0.002 (0.330)	0.374	0.415	8.512

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for bank size are positive with return on assets. It indicates that bank size has a positive impact on return on assets. This finding is consistent with the findings of Dodi *et al.* (2018). In contrast, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is similar to the findings of Alnabulsi *et al.* (2023). However, the beta coefficients for number of branches are positive with return on assets. It indicates that number of branches have positive impact on return on assets. This finding is consistent with the findings of Jathurika (2018). Likewise, the beta coefficients for operational efficiency are positive with return on assets. It indicates that operational efficiency has a positive impact on return on assets. This finding is not similar to the findings of Udiin and Hossain (2020). Further, the beta coefficients for capital adequacy ratio are positive with return on

assets. It indicates that capital adequacy ratio has a positive impact on return on assets. This finding is consistent with the findings of Widyatmoko and Risman (2024). In contrast, the beta coefficients for cash reserve ratio are negative with return on assets. It indicates that cash reserve ratio has a negative impact on return on assets. This finding is similar to the findings of Akinleye and Oluwadare (2022). However, the beta coefficients for loan-to-deposit ratio are positive with return on assets. It indicates that loan-to-deposit ratio has a positive impact on return on assets. This finding is consistent with the findings of Sihotang *et al.* (2022).

Table 5 shows the regression results of bank size, non-performing loans, number of branches, operating efficiency, capital adequacy ratio, cash reserve ratio and loan-to-deposit ratio with net interest margin of Nepalese commercial banks

Table 5

Estimated regression results of bank size, non-performing loans, number of branches, operating efficiency, capital adequacy ratio, cash reserve ratio and loan-to-deposit ratio with net interest margin

The results are based on panel data of 10 commercial banks with 100 observations for the period of 2013/14-2022/23 by using the linear regression model and the model is $NIM = \beta_0 + \beta_1 BS + \beta_2 NPL + \beta_3 NOB + \beta_4 OE + \beta_5 CAR + \beta_6 CRR + \beta_7 LTD + e_{it}$ where, the dependent variable is NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are BSIZE (Bank size as measured by total assets, Rs. in billions), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), NOB (Number of branches as measured by total number of branches, in numbers), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CRR (Cash reserved ratio as measured by the ratio of reserved requirement to total deposit, in percentage) and LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage).

Model	Intercept	Regression coefficients of							Adj. R ²	SEE	F-value
		BS	NPL	NOB	OE	CAR	CRR	LTD			
1	21.442 (3.721)**	1.636 (3.142)**							0.082	1.240	9.870
2	2.934 (20.132)**		-0.396 (4.732)**						0.178	1.173	22.392
3	3.429 (12.241)**			0.001 (0.428)					0.009	1.337	0.183
4	1.535 (3.000)**				0.042 (3.637)**				0.110	1.221	13.225
5	3.748 (5.409)**					0.029 (0.595)			0.007	1.298	0.354
6	2.926 (8.805)**						-0.022 (1.362)		0.009	1.288	1.855
7	4.197 (3.666)**							0.011 (0.751)	0.004	1.297	0.564
8	26.193 (5.211)**	2.108 (4.629)**	-0.459 (5.931)**						0.320	1.067	24.245
9	26.163 (3.865)**	2.103 (3.361)**	-0.446 (4.938)**	0.010 (0.087)					0.310	1.105	14.194
10	23.556 (3.535)**	1.963 (3.215)**	-0.383 (4.187)**	0.001 (0.553)	0.029 (2.450)*				0.349	1.074	12.773
11	23.749 (3.566)**	2.074 (3.352)**	-0.366 (3.954)**	0.001 (0.723)	0.034 (2.681)*	0.063 (1.083)			0.350	1.073	10.474
12	22.869 (3.429)**	1.976 (3.183)**	-0.394 (4.157)**	0.002 (0.900)	0.029 (2.102)*	0.042 (0.702)	-0.019 (1.285)		0.355	1.068	9.072
13	22.734 (3.422)**	1.822 (2.891)**	-0.430 (4.365)**	0.002 (0.971)	0.029 (2.102)*	0.041 (0.685)	-0.030 (1.742)	0.019 (1.278)	0.360	1.064	8.070

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Net interest margin is the dependent variable.

Table 5 shows that the beta coefficients for bank size are positive with net interest margin. It indicates that bank size has a positive impact on net interest margin. This finding is similar to the

findings of Ezechukwu and Amahalu (2017). In contrast, the beta coefficients for non-performing loan are negative with net interest margin. It indicates that non-performing loan has a negative impact on net interest margin. This finding is consistent with the findings of Brastama and Yadnya (2020). However, the beta coefficients for number of branches are positive with net interest margin. It indicates that number of branches have positive impact on net interest margin. This finding is similar to the findings of Almazari (2014). Likewise, the beta coefficients for operational efficiency are positive with net interest margin. It indicates that operational efficiency has a positive impact on net interest margin. This finding is consistent with the findings of Mugun (2019). Further, the beta coefficients for capital adequacy ratio are positive with net interest margin. It indicates that capital adequacy ratio has a positive impact on net interest margin. This finding is similar to the findings of Oke *et al.* (2022). In contrast, the beta coefficients for cash reserve ratio are negative with net interest margin. It indicates that cash reserve ratio has a negative impact on net interest margin. This finding is consistent with the findings of Olagunju and Isiaka (2021). However, the beta coefficients for loan-to-deposit ratio are positive with net interest margin. It indicates that loan-to-deposit ratio has a positive impact on net interest margin. This finding is similar to the findings of Nugraha *et al.* (2021).

4. Summary and conclusion

Commercial banks are important financial intermediaries that play a greater role in economic development of any country. They collect funds from surplus units and provide loan to deficit units earning profit in between those function. During these activities, commercial banks carry a huge risk of loan default and difficulty in payment to depositors which may be affiliated to various factors such as instability in the government, instable economic condition or other bank related factors that may or may not be avoided. These risks may hinder the performance and ultimately the stability of banking system. Commercial banks must analyze the factors that may be associated with their performance to come up with a way to minimize the negative effects so that the overall financial system (in general) and economy (as a whole) will be stable.

This study attempts to analyze the organization characteristics, efficiency, financial regulation and performance of Nepalese commercial banks. The study is based on secondary data of 10 commercial banks with 100 observations for the period from 2013/14 to 2022/23.

The major conclusion of this study is that bank size, number of branches, operating efficiency, capital adequacy ratio and loan-to-deposit ratio have positive impact on return on assets and net interest margin. It indicates that increase in bank size, number of branches, operating efficiency, capital adequacy ratio and loan-to-deposit ratio leads to increase in return on assets and net interest margin. However, non-performing loan and cash reserve ratio have negative impact on return on assets and net interest margin. It indicates that increase in non-performing loan and cash reserve ratio leads to decrease in return on assets and net interest margin. Likewise, the study also concluded that bank size followed by capital adequacy ratio is the most influencing factor that explains the changes in the return on asset in the context of Nepalese commercial banks. Similarly, the study also concluded that non-performing loan followed by operational efficiency is the most influencing factor that explains the changes in the net interest margin in the context of Nepalese commercial banks.

References

- Abel, S., and P. Le Roux, 2016. Determinants of banking sector profitability in Zimbabwe. *International Journal of Economics and Financial Issues* 6(3), 845-854.
- Adhikari, K., K. Mainanli, and M. Kargbo, 2020. Impacts of bank capital, liquidity, and credit risk performance on Nepalese commercial banks. *Nepalese Journal of Finance* 7(3), 143-156.

- Akinleye, G. T., and O. E. Oluwadare, 2022. Cash reserve requirement and banks' profitability: Evidence from deposit money banks in Nigeria. *Academy of Accounting and Financial Studies Journal* 26(1), 1-13.
- Akter, R., and J. K. Roy, 2017. The impacts of non-performing loan on profitability: An empirical study on banking sector of Dhaka stock exchange. *International Journal of Economics and Finance* 9(3), 126-132.
- Alfadhli, M. S., and M. S. AlAli, 2021. The effect of bank size on financial performance: a case study on Kuwaiti Banks. *Journal of Insurance and Financial Management* 4(3), 11-15.
- Ali, S. A., and Z. Ghazali, 2018. Impact of firm size on profitability: A comparative study of Islamic Bank and commercial Bank in Pakistan. *Global Journal of Management and Business Research* 18(5), 30-35.
- Almazari, A. A., 2014. Impacts of internal factors on financial performance: Comparative study between Saudi Arabia and Jordan. *Journal of Applied Finance and Banking* 4(1), 125-135.
- Alnabulsi, K., E. Kozarević, and A. Hakimi, 2023. Non-performing loans and net interest margin in the MENA region: Linear and non-linear analyses. *International Journal of Financial Studies* 11(2), 1-17.
- Alshebmi, A. S., M. H. M. Adam, A. M. Mustafa, and M. T. D. O. E. Abdelmaksoud, 2020. Assessing the non-performing loans and their effect on banks profitability: Empirical evidence from the Saudi Arabia banking sector. *International Journal of Innovation, Creativity and Change* 11(8), 69-93.
- Amalia, S., 2021. The impact of financial ratio indicators on banking the financial performance in Indonesia. *Turkish Journal of Computer and Mathematics Education* 12(8), 580-588.
- Anggari, N. L. S., and I. M. Dana, 2020. The effect of capital adequacy ratio, third party funds, loan to deposit ratio, bank size on performance in banking companies on IDX. *American Journal of Humanities and Social Sciences Research* 4(12), 334-338.
- Anggraeni, A., B. Basuki, and R. Setiawan, 2022. Factors influencing on bank capital and the financial performance: Evidence of government banks in Indonesia. *The Journal of Asian Finance, Economics and Business* 9(2), 185-191.
- Bogale, Y. W., 2019. Factors affecting profitability of banks: Empirical evidence from Ethiopian private commercial banks. *Journal of Investment and Management* 8(1), 8-15.
- Brastama, R. F., and I. P. Yadnya, 2020. The effect of capital adequacy ratio and non-performing loans on banking stock prices with the financial performance as intervening variable. *American Journal of Humanities and Social Sciences Research* 4(12), 43-49.
- Budhathoki, P. B., K. C. Rai, P. K. Lamichhane, G. Bhattarai, and A. Rai, 2020. The impacts of liquidity, leverage, and total size on banks' performance: Evidence from Nepalese commercial banks. *Journal of Economics and Business* 3(2), 123-135.
- Chalise, S., 2019. The impacts of capital adequacy ratio and cost income ratio on the performance of Nepalese commercial banks. *International Journal of Economics and Management* 6(7), 78-83.
- Djaya, N. K., and I. Yanuarti, 2021. The influence of capital adequacy ratio and non-performing loan on performance of commercial banks listed on the Indonesia Stock Exchange in 2017-2019. *Business Excellence and Management* 11(4), 80-94.
- Do, H., T. Ngo, and Q. Phung, 2020. The effect of non-performing loans on profitability of commercial banks: Case of Vietnam. *Accounting* 6(3), 373-386.
- Dodi, D., D. Supiyadi, M. Arief, and N. Nugraha, 2018. Islamic bank profitability: A study of Islamic bank in Indonesia. *The International Journal of Business* 1(1), 51-62.
- Ezechukwu, B. O., and N. N. Amahalu, 2017. Effect of firm characteristics on financial performance of quoted deposit money banks in Nigeria. *Contemporary Issues in Business Management: A Multidisciplinary Approach* 1(1), 387-409.

- Gill, A., M. Singh, N. Mathur, and H. S. Mand, 2014. The impact of operational efficiency on the future performance of Indian manufacturing firms. *International Journal of Economics and Finance* 6(10), 259-269.
- Gnawali, A., 2018. Non-performing asset and its effects on performance of Nepalese commercial banks. *Journal of Research in Business Studies and Management* 5(9), 39-47.
- Gupta, N., and J. Mahakud, 2020. Ownership, bank size, capitalization and bank performance: Evidence from India. *Cogent Economics and Finance* 8(1), 1-39.
- Haryanto, S., E. Aristanto, P. Assih, Z. Aripin, and Y. Bachtiar, 2021. Effect of loan-to-deposit ratio, credit risk on the financial performance and net interest margin as moderating variables. *AFRE Accounting and Financial Review* 4(1), 146-154.
- Hoque, Md. A., A. Ahmad, M. Chowdhury, and M. Shahidullah, 2020. Impact of monetary policy on bank's profitability: A study on listed commercial banks in Bangladesh. *International Journal of Accounting and Finance Review* 5(2), 72-79.
- Hossain, M. S., and A. N. M. Saif, 2019. Impact of firm size on financial performance of banking companies in Bangladesh. *Journal of Banking and Financial Services* 11(2), 143-160.
- Islam, M. S., and S. I. Nishiyama, 2016. The determinants of bank net interest margins: A panel evidence from South Asian countries. *Research in International Business and Finance* 37, 501-514.
- Jaouad, E., and O. Lahsen, 2018. Factors affecting bank performance: An empirical evidence from Morocco. *European Scientific Journal* 14(34), 255-267.
- Jathurika, M., 2018. Impact of branches nationwide on performance of selected listed commercial banks in Srilanka. *Global Scientific Journal* 6(9), 523-532.
- Khati, P., 2020. Impacts of liquidity on performance of Nepalese commercial banks. *Journal of Economics and Finance* 11(6), 26-33.
- Kingu, P. S., S. Macha, and R. Gwahula, 2018. Impacts of non-performing loans on bank's performance: Empirical evidence from commercial banks in Tanzania. *International Journal of Scientific Research and Management* 6(1), 71-79.
- Langodai, D. J., and N. Q. Lutfillah, 2019. Influence of third-party funds, capital adequacy ratio, and non-performing loans to credit distribution on the Indonesia Stock Exchange. *Research in Management and Accounting* 2(1), 14-25.
- Laryea, E., M. Ntow-Gyamfi, and A. A. Alu, 2016. Nonperforming loans and bank profitability: Evidence from an emerging market. *African Journal of Economic and Management Studies* 7(4), 462-481.
- Lestari, H. S., H. Chintia, and I. C. Akbar, 2021. Determinants of net interest margin on conventional banking: Evidence in Indonesia stock exchange. *Jurnal Keuangan dan Perbankan* 25(1), 104-116.
- Liang, H. Y., Y. P. Ching, and K. C. Chan, 2013. Enhancing bank performance through branches or representative offices? Evidence from European banks. *International Business Review* 22(3), 495-508.
- Martiningtiyas, C. R., and D. T. Nitinegeri, 2020. The effect of non-performing loans on performance in banking sector in Indonesia. *International Journal on Management, Accounting, and Economy* 151(8), 64-67.
- Mbekomize, C. J., and M. Mapharing, 2017. Analysis of determinants of profitability of commercial banks in Botswana. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 7(2), 131-144.
- Mendoza, R., and J. P. R. Rivera, 2017. The effect of credit risk and capital adequacy on the profitability of rural banks in the Philippines. *Scientific Annals of Economics and Business* 64(1), 83-85.
- Menicucci, E., and G. Paolucci, 2016. The determinants of financial performance: An empirical evidence from European banking sector. *Journal of Financial Reporting and Accounting* 14(1), 86-115.

- Mesfin, E. A., and B. Ram, 2019. Determinants of net interest margin in selected commercial banks in Ethiopia. *International Journal of Scientific Research and Reviews* 8(1), 1646-1655.
- Mir, S. M., and F. A. Shah, 2022. Does capital adequacy affect bank performance? A comparative study of select public and private sector banks in India. *Business and Economics Review* 31(2), 34-52.
- Mugun, W., 2019. Effect of operating expense ratio on financial performance of microfinance institutions in Kenya. *International Journal of Novel Research in Humanity and Social Sciences* 6(04), 91-102.
- Mun, S. G., and S. S. Jang, 2018. Restaurant operating expenses and their effects on profitability enhancement. *International Journal of Hospitality Management* 71, 68-76.
- Neupane, B. P., 2020. Performance determinants of Nepalese commercial banks. *Press Academia Procedia* 12(5), 40-45.
- Nugraha, N. M., A. Yahya, T. N. Nariswari, F. Salsabila, and I. Y. Octaviantika, 2021. Impact of non-performing loans, loan to deposit ratio and education diversity on firm performance of Indonesia banking sectors. *Review of International Geographical Education Online* 11(3), 85-96.
- Oke, B. O., and F. Ikpesu, 2022. Capital adequacy, asset quality and banking sector performance in Nigeria. *Acta Universitatis Danubius* 18(5), 37-46.
- Olagunju, I. L., and N. A. Isiaka, 2021. The economic implication of cash reserve requirement on the profitability of deposit money banks in Nigeria. *Cross-Cultural Communication* 17(1), 38-47.
- Parvin, S., A. M. H. Chowdhury, A. Siddiqua, and J. Ferdous, 2019. Effect of liquidity and bank size on the profitability of commercial banks in Bangladesh. *Asian Business Review* 9(1), 7-10.
- Petkovski, V., and R. Kjosovski, 2014. Does banking sector development promote economic growth? An empirical analysis for selected countries in Central and South Eastern Europe. *Economic Research Ekonomska Istraživanja* 27(1), 55-66.
- Riaz, S., and A. Mehar, 2013. The impact of bank specific and macroeconomic indicators on the profitability of commercial banks. *Romanian Economic Journal* 16(47), 1-11.
- Safitri, M., and V. Oktavia, 2022. The role of interest rates on the effect of non-performing loans and capital adequacy ratios on banking performance (case study on conventional commercial banks listed on the Indonesia stock exchange 2016-2020). *Journal Cakrawala Ilmiah* 1(7), 1785-1796.
- Saini, P., and J. Sindhu, 2014. Role of commercial bank in the economic development of India. *International Journal of Engineering and Management Research* 4(1), 27-31.
- Saleh, D. S., and E. Winarso, 2021. Analysis of non-performing loans (NPL) and loan-to-deposit ratio (LDR) towards the financial performance. *International Journal of Multicultural and Multireligious Understanding* 8(1), 423-436.
- Santika, E., M. H. Fakhruhozy, W. M. Nur, and H. S. Lestari, 2022. Effect of operational risk on financial performance in banking industry. *Jurnal Ekonomi* 27(1), 123-137.
- Setiawan, Y., and M. Nupus, 2021. The effect of capital adequacy ratio and loan-to-deposit ratio on banking profitability. *International Journal of Business and Management* 1(1), 79-89.
- Sihotang, M. K., U. Hasanah, and I. Hayati, 2022. Model of Sharia bank the financial performance determination factors by measuring internal and external variables. *Indonesian Interdisciplinary Journal of Sharia Economics* 5(1), 235-251.
- Silaban, P., 2017. The effect of capital adequacy ratio, net interest margin and non-performing loans on financial performance: The case of Indonesia. *International Journal of Economics and Business Administration* 5(3), 58-69.
- Suroso, S., 2022. Analysis of the effect of capital adequacy ratio and loan to deposit ratio on the profits of public

- banks in the Indonesia Stock Exchange (IDX) Period 2016-2021. *Economit Journal: Scientific Journal of Accountancy, Management and Finance* 2(1), 45-53.
- Susantih, S., and H. Ompusunggu, 2022. Analysis of loan-to-deposit ratio and non-performing loans on the financial performance on the financial performance PT BPR Dana Nagoya. *Conference on Business, Social Sciences and Technology* 2(1), 37-49.
- Uddin, M. K., 2022. Effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. *European Journal of Business and Management Research* 7(3), 289-295.
- Uddin, M. K., 2022. Effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. *European Journal of Business and Management Research* 7(3), 289-295.
- Udiin, M. H., and M. S. Hossain, 2020. Impact of operating expenditures on firms' profitability. *ELK Asia Pacific Journal of Finance* 11(4), 1-18.
- Unvan, Y. A., and I. N. Yakubu, 2020. Do bank-specific factors drive bank deposits in Ghana? *Journal of Computational and Applied Mathematics* 376(1), 1-7.
- Widyatmoko, Y. W., and A. Risman, 2024. The moderating role of foreign ownership on the influence of digital finance, capital adequacy, efficiency and asset quality on profitability (Study at KBMI 3 and 4 Commercial Banks on the IDX 2015-2022). *International Journal of Innovative Science and Research Technology* 9(2), 315-322.
- Wu, M. L., 2020. The internal determinants of performance of commercial banks in China: A panel data modeling based empirical study. *International Journal of Managerial Studies and Research* 8(3), 1-12.

Chapter 29

Effect of diversification on profitability of Nepalese commercial banks

- Nishchal Sharma*

Abstract

This study employs both descriptive and causal-comparative research designs, addresses the effect of diversification strategies deployed in the commercial banks of Nepal to perform financially. Both single-step and multi-step regression analysis techniques are considered for the analysis of data. This exhibition is based on secondary data obtained from the annual reports and circulars of a sample of 12 Nepalese commercial banks out of total 20, comprising 2 public banks, 5 joint venture banks, and 5 private banks, totaling 108 observations, by employing panel data from fiscal year 2015-16 to 2022-23, considering 8-years as study period. The investigation utilized several statistical and econometric tools and techniques, including descriptive statistics, correlation analysis, regression analysis and t-tests. The Statistical Package for Social Sciences (SPSS) and Microsoft Excel (MS-Excel) programs were utilized to process, evaluate and analyze the information in order to extract the significant insights and results.

The study showed that income diversification positively impacted both return on assets as well as return on equity of Nepalese commercial banks. It indicates that the increase in diversity of income source increases profitability of Nepalese commercial banks. Similarly, the result shows the positive impact of geographical diversification on ROA but negative impact on ROE. It indicates that increase in geographical diversification increases ROA but decreases ROE. Likewise, the result showed the positive influence of product diversification on ROA but negative influence in ROE which indicates that increase in product diversification increases ROA but decreases ROE. Also, the result showed the positive impact of asset diversification on ROA but negative impact on ROE. It indicates that increase in asset diversification increases ROA but decreases ROE. Similarly, the result showed the positive effect of funding diversification on ROA but negative effect on ROE, indicating that increase in funding diversity increases ROA but decreases ROE. Additionally, the study showed that board diversification negatively impacts both ROA and ROE. It indicates that increase in board diversification decreases both ROA and ROE or profitability of Nepalese commercial banks.

Keywords: income diversification, geographical diversification, product diversification, asset diversification, funding diversification, board diversification, return on assets and return on equity

1. Introduction

Commercial banks are the financial intermediaries which provide platform to demanders and suppliers of capital. Among the different components of economic system of a country, banking system perhaps is the most significant component that plays a vital role in mobilizing the financial resources by extending credit to various investors and businesses (Mokaya and Jagongo, 2014). The general understanding in the banking industry about the diversification is that it improves the financial performance by reducing the volatility in financial returns of commercial banks. Further, supporting this general understanding, Turkmen and Yigit (2012) indicated that commercial banks' financial performances are influenced by diversification since losses from one segment or exposure source can always be recovered or compensated by gains from other exposures or segments. Diversification is a genre of strategies for growth and marketing, using which an organization looks into raising profitability through higher volume of sales that can be achieved through new markets and new products. It is different from other strategies such as merger, acquisition, new start-up and Joint Venture. It requires an organization to acquire new techniques, new skills and new facilities. Hence, diversification is considered the riskiest among various strategies that can be pursued by an organization. (Makokha et al., 2016). In general terms, diversification refers to be involved in more market areas and/or more products. In

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terms for commercial banks and financial organizations, diversification refers to the expected inflow of more non-interest revenues and enriching structure of assets in banks, which generally are named as income diversification and asset diversification (Chu et al., 2021). Osifo and Osagie (2020) conferred that diversification enhances the corporate organizations' financial performances with the reason being that it enables the organizations to leverage the resources in order to establish and support different new projects, and thus complementing organization's final performance. With the banking industry facing increased competition, most of the banks are adopting strategies of diversification (Tan and Chintakananda, 2016).

Competitive edge in the banking industry creates an atmosphere for competitors in attracting and retaining the customers as well as fending off other factors forcing competition. Therefore, commercial banks should consistently look around and scan their competitive surroundings and business where they operate. With the proper examining of the competitive surroundings, commercial banks can implement various strategies of diversification that guarantee superior financial performance in the banking industry (Amidu and Wolfe, 2013). Sissy et al. (2017) asserted that cross border banking and diversification of sources of revenue generation as interest and non-interest income enhances the stability and profitability of banks. Banks should adopt in both revenue and cross border banking diversification simultaneously so that the banks can attain higher gain by reducing risks and increasing financial performance. Berger et al. (2010) stated that diversification can be measured in four major dimensions: deposits, loans, assets and geography. Phung and Mishra (2016) affirmed that firm diversification strategy reduced firm performance. Stiroh (2004) discovered a negative association between diversification and bank profitability of US community banks. Moudud-Ul-Huq et al. (2018) looked to contribute towards the debate on the cost and benefits of bank diversification by observing that the diversification heterogeneously benefits banks and the diversified banks have lower risks and higher performance. The authors stated that diversification might benefit the banks if diversified activities yield a high return and are less risky, while it might hurt banks if the diversified activities yield low returns and are riskier. As per Acharya et al. (2006) diversification does not guarantee superior performance and/or greater safety for banks. Mercieca et al. (2007) confirmed that there are not any direct benefits of diversification within and across business lines for those banks due to lack of expertise and experience. Further, the authors suggested that higher non-interest income leads to increased risk and lower profitability. Brighi and Venturelli (2013) analyzed the impact of revenue and geographic diversification on some principal performance indicators and suggested that revenue and geographical diversification play a crucial role in determining bank performance. They further disclosed that diversification improve profitability of banks (return on assets and risk adjusted return on assets). Goddard et al. (2008) implied that similar diversification strategies are not appropriate for small and large credit unions. The authors suggested that the small credit unions should not go for diversification to operate as simple financial institutions with savings and loan services. However, large credit unions should be encouraged to exploit the opportunities shown by diversification. Similarly, Hayden et al. (2007) commented that there is only a little evidence that diversification is associated with large performance benefits in high-risk banks.

Hamdi et al. (2017) mentioned that the diversification in commercial banks boosted bank performance indicating the positive relationship between diversification and bank performance. Elsas et al. (2010) stated that diversification increases bank profitability and, as a consequence also market valuations indicating the positive relationship between diversification and profitability. Flamini and Schumacher (2009) revealed that higher Returns on Assets (ROA) were associated with larger bank size, diversification, and private ownership, directing the positive relationship between diversification and return on assets. An analysis on diversification and bank profitability by Gambacorta, et al. (2014) showcased that income diversification is correlated positively with bank profitability only up to a

certain degree. Benefits from diversification are not as great and noteworthy for globally systemically important institutions, particularly when using volatility-adjusted return as a proxy for bank profitability. According to the revelation by Pisedtasalasai and Edirisuriya (2020) there is a strong and significant bidirectional relationship between diversification and Sri Lankan bank performance. The performance of banks in Sri Lanka has been significantly improved because of the diversification attempts. In other words, the more the banks are diversified, the more they are profitable in long-term. Sharma and Anand (2018) showed that, for medium- and large-sized banks, diversity and performance as assessed by bank risk and returns are positively correlated. This link, however, suggests a “diversification discount” for small banks. Sarwar et al. (2020) identified various factors such as bank-specific, diversification, regulatory and industry concentration that affect the profitability of commercial banks. They further revealed that, among the bank-specific variables, credit risk, funding cost, market share, managerial efficiency and operating cost are significant predictors of bank margins. For diversification non-interest income is negatively associated with bank margins whereas asset diversification is positively associated with bank margins.

One reasoning suggests that diversification supports banks and financial institutions extend the fixed costs throughout various products and gain economies of scale (Laeven & Levine, 2007), coming up with abilities and skills of management in order to bear on various markets and products (Iskandar-Datta & McLaughlin, 2007), diminishing bankruptcy risk (Berger et al., 2010), and acquiring efficient decision making skills in advance within new areas (Elsas et al., 2010). In contrary, another reasoning supports that diversification leads to increase in problem of agency between small shareholders and corporate insiders (Laeven & Levine, 2007), makes managers work outside their expertise and diminishes the competitive edge of management (Klein & Saldenberg, 1998), increases revenue volatility causing volatility of profits (Berger et al., 2010), and in a higher competitive markets, exaggerate costs for institutions that seek to enter into a new market (Winton, 1999).

In Nepalese context, Shahu (2022) analyzed the effect of revenue diversification on financial performance and risk of Nepalese banking industry and the result showed that banks that diversify their revenue streams can lower risk while increasing their financial performance and value for investors. Similarly, Neupane (2020) examined the key determinants of profitability of Nepalese commercial banks and the result showed that the factors that affect the profitability are capital sufficiency, the total number of branches, and the yearly rate of inflation. Likewise, Prajapati and Shah (2019) showed that there is positive impact of income diversification on the risk adjusted performances of the Nepalese commercial and development banks. Also, Thagunna et al. (2024) showed that board diversity has a positive impact on return on equity that increase in proportion female directors on board leads to increase in return on assets and return on equity. However, Budhathoki and Rai (2020) revealed that diversity has little to no influence on banks’ profitability.

The above discussion shows that a lot of studies related to the impact of various diversification strategies on profitability of commercial bank have been commenced in many different countries. However, most of those studies do not have gravity of any magnitude to generalize in Nepalese context. Some studies on revenue, geographical and board diversification have also been commenced in Nepal. However, no proper assessment of relationship between income diversification, geographical diversification, product diversification, asset diversification, funding diversification and board diversification, and profitability could be entrenched in those studies in recent time.

The major objective of this study is to examine the effect of diversification on profitability of Nepalese commercial banks. The specific objectives of this study is to examine the relationship of income diversification, geographical diversification, product diversification, asset diversification,

funding diversification and board diversification with return on assets and return on equity.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws conclusions and discuss the implications of the study findings.

2. Methodological Aspects

This study is based on the secondary data which were gathered for 12 commercial banks of Nepal. The main sources of the data are the annual reports and circulars of selected commercial banks. The data were collected for income diversification, geographical diversification, product diversification, asset diversification, funding diversification, board diversification, return on assets and return on equity. These data were collected for the period 2014-15 to 2022-23 making the total of 108 observations. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the number of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of banks selected for the study along with the study period and number of observations

S. N.	Name of the banks	Study period	Observations
1	Agriculture Development Bank Limited	2014/15-2022/23	9
2	Rastriya Banijya Bank Limited	2014/15-2022/23	9
3	Everest Bank Limited	2014/15-2022/23	9
4	Himalayan Bank Limited	2014/15-2022/23	9
5	Nabil Bank Limited	2014/15-2022/23	9
6	Nepal SBI Bank Limited	2014/15-2022/23	9
7	NMB Bank Limited	2014/15-2022/23	9
8	Citizens Bank International Limited	2014/15-2022/23	9
9	Global IME Bank Limited	2014/15-2022/23	9
10	Machhapuchchhre Bank Limited	2014/15-2022/23	9
11	NIC Asia Bank Limited	2014/15-2022/23	9
12	Siddhartha Bank Limited	2014/15-2022/23	9
Total number of observations			108

Thus, the study is based on the 108 observations.

The model

The model estimated in this study assumes that profitability depends on several independent variables. The independent variables considered in this study are income diversification, geographical diversification, product diversification, asset diversification, funding diversification and board diversification. Therefore, the model takes the following forms:

$$ROA_{it} = \beta_0 + \beta_1 ID_{it} + \beta_2 GD_{it} + \beta_3 PD_{it} + \beta_4 AD_{it} + \beta_5 FD_{it} + \beta_6 BD_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 ID_{it} + \beta_2 GD_{it} + \beta_3 PD_{it} + \beta_4 AD_{it} + \beta_5 FD_{it} + \beta_6 BD_{it} + e_{it}$$

where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

ID = Income diversification as measured by the HHI index of interest income and non-interest income to total income, in ratio.

GD = Geographical diversification as measured by the total number of branches, in number.

PD= Product diversification as measured by the total number of deposit and loan products, in number.

AD= Asset diversification as measured by the HHI index if loans and non-loan assets to total assets, in ratio.

FD= Funding diversification as measured by the HHI index of equity, short-term interbank borrowing, deposits, subordinated term debt and short-term money market borrowing or certificate of deposits to total funds, where total funds is the sum of equity, short-term interbank borrowing, deposits, subordinated term debt and short-term money market borrowing or certificate of deposits, in ratio.

BD = Board diversification as measured by number of female directors among the board members, in number.

e_{it} = Error term, and

β_0 is the constant term and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 are the beta coefficients of independent variables.

The following section describes the dependent and independent variables used in this study along with hypothesis formulation:

Income diversification

A bank can increase its share of net trading profits, fees, and other noninterest income within its net operating income by implementing income diversification (Gurbuz et al., 2013). Income diversification is an expansion into new revenue earning banking and financial services including traditional intermediation services (Ebrahim and Hasan, 2008). The standard measure of income diversification is the Herfindahl-Hirschman Index (Olaewaju, 2018; Jouda, 2018; Batool and Jamil 2019; Brahmana et al., 2018). The Herfindahl-Hirschman Index (HHI), which is calculated as follows, was used in the study as a measure of income diversification. Damankah et al. (2015) investigated the income diversification and financial stability of banks in Ghana. The study considered the income source and profits data of banks from the period from 2002 to 2011. According to the report, interest revenue continues to be Ghana's largest source of bank profits. Ndungu and Muturi (2019) explored the effect of diversification on financial performance of commercial banks in Kenya for the period of 2013-2017 with ROA and ROE as the financial performance indicators. The investigation showed that income diversification had positive impact on financial performance. Based on it, the study develops the following hypothesis:

H₁: There is a positive relationship between income diversification and profitability.

Geographical diversification

Geographical diversification refers to diversification of business across multiple locations

either inside the company's home country territory or outside the home country for the motive of generating more earnings for the company. Geographic diversification is considered as an important strategy by most firms (Cheng and Roulac, 2007). A common strategic expansion approach used by many banks worldwide is geographic diversification. This approach entails dispersing bank activities over numerous markets both domestically and internationally (Zoghلامي, 2020). Based on the study of Ndungu and Muturi (2019), this study uses number of branches as the proxy for geographical diversification. Cai et al. (2016) stated that geographical expansion of banks increases market share, net interest margin and non-interest income, but it is also associated with rising operating costs. Cotugno and Stefanelli (2010) revealed a strong positive association between geographical diversification and profitability for Italian banks over a period from 2005 to 2010. Based on it, the study develops the following hypothesis:

H₂: There is a positive relationship between geographical diversification and profitability.

Product diversification

Product diversification is a tactic that is employed by a business organization in order to boost the profitability of the organization and achieve higher sales volume with by selling new products. More varieties and options for products and services are made possible by product diversification. Product diversification greatly enhances a company's profitability and brand image when done correctly (Githaiga, 2022). Kenyori et al. (2016) conducted a research on the effects of product diversification strategy on financial performance of selected banks in Kericho Town and the findings revealed positive and significant relationship between product diversification and financial performance of banks. Maina (2013) conducted an investigation to study the relationship between product diversification and commercial banks' financial performance in Kenya using secondary data for the investigation period from 2008 to 2012. Correlation analysis, regression analysis and Herfindahl-Hirschman Index (HHI) were used to illuminate that the financial performance of commercial banks in Kenya are positively influenced by product diversification. Based on it, the study develops the following hypothesis:

H₃: There is a positive relationship between product diversification and profitability.

Asset diversification

Asset diversification states the act of dividing one's investable capital between different asset classes to mitigate risk in better way. Asset diversification is a diversification and group strategy that joins together more than one asset which lowers the investment portfolio risk as a whole; so that asset diversification can be acknowledged as a fundamental principle of sound investment (Mochabo et al., 2017). Referring to the study of Al-khouri and Arouri (2019), the measurement of asset diversification is performed by the adoption of Herfindahl-Hirschman Index (HHI) which is computed as follows:

$$HHI = 1 - \left(\frac{\text{Loans}}{\text{Total assets}} \right)^2 - \left(\frac{\text{Non-loan assets}}{\text{Total assets}} \right)^2$$

Chu et al. (2021) looked into the performance and diversity of banks using ROA as a proxy for bank performance. The result suggested positive effect of asset diversification on bank performance. Most of the studies based on US economy find that assets diversification increases bank performance such as Hughes et al. (1999) and Deng et al. (2007). Based on it, the study develops the following hypothesis:

H₄: There is a positive relationship between asset diversification and profitability.

Funding diversification

According to Berger and Bouwman (2009), funding diversification is the practice of a financial institutions, sourcing their funds from a variety of sources or instruments or channels to minimize risk and ensure stability which can involve different types of deposits, equity, debt instruments, and other financial sources, thereby reducing single funding source dependence. Referring to the study of Fresno and Hanggraeni (2020) funding diversification is calculated by the adoption of Herfindahl-Hirschman Index (HHI) which is computed as follows which includes equity (EQUI); short-term interbank deposits (IBDEP); deposits from customers (CDEP); long-term market funding, such as subordinated debts (LDEBT); and short-term market funding, such as certificates of deposit (SDEBT).

$$HHI = 1 - \left(\left(\frac{EQUI}{FUND} \right)^2 + \left(\frac{IBDEP}{FUND} \right)^2 + \left(\frac{CDEP}{FUND} \right)^2 + \left(\frac{LDEBT}{FUND} \right)^2 + \left(\frac{SDEBT}{FUND} \right)^2 \right)$$

Abbas et al. (2021) states that funding diversification improves the certainty of a bank's capital and has a positive influence on bank profitability. Huang and Ratnovski (2008) provide the demerits of relying on wholesale source of funding in the sense that wholesale funding may have an incentive to withdraw the funding based on noisy and cheap signals of asset quality of bank, which could lead to a significant profit decrease due to a lack of cheap funding, indicating to diversify the source of funding to improve profitability of banks. Based on it, the study develops the following hypothesis:

H₅: There is a positive relationship between funding diversification and profitability.

Board diversification

Hoogendoorn et al. (2011) conveys that teams or groups that are made up of both men and women show better performance in terms of earnings per share, profits and revenues. The board's gender structure influences the quality of monitoring role and the financial performance of the firm. The economic gains are the outcome of greater board gender diversity. Ujunwa et al. (2012) studied the effect of corporate board diversification on the financial performance of Nigerian quoted firms during the period from 1991 to 2008 using least square regression to assess the impact of board diversification on firm performance which was measured by ROA. According to the report, shareholders believe that the inclusion of women on the board indicates that big changes are about to occur. Based on it, the study develops the following hypothesis:

H₆: There is a positive relationship between board diversification and profitability.

3. Result and Discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2014-15 to 2022-23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2014-15 to 2022-23. The dependent variables are ROA (Return on assets, measured by the ratio of net income to total asset, in percentage) and ROE (Return on equity, measured by the ratio of net income to total equity, in percentage). The independent variables are ID (Income diversification as measured by the Herfindahl-Hirschman Index(HHI) using interest

income, non-interest income and total income, in ratio), GD (Geographical diversification, measured by the number of branches, in number), PD (Product diversification, measured by the total number of deposit and loan products, in number), AD (Asset diversification, measured by Herfindahl–Hirschman Index (HHI) using loans, non-loan assets and total assets, in ratio), FD (Funding diversification, measured by Herfindahl–Hirschman Index (HHI) using equity, short-term interbank borrowing, deposits, subordinated term debt, short term money market borrowing or certificate of deposits and total funds, in ratio) and BD (Board diversification, measured by number of female directors, in number).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.22	1.63	0.50
ROE	3.94	33.11	15.09	4.84
ID	0.09	0.48	0.22	0.09
GD	42	360	147.40	85.91
PD	19	136	42.32	19.30
AD	0.36	0.50	0.42	0.03
FD	0.10	0.48	0.23	0.06
BD	0	2	0.49	0.54

Source: Output from SPSS

Correlation Analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the correlation coefficients of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2014-15 to 2022-23. The dependent variables are ROA (Return on assets, measured by the ratio of net income to total asset, in percentage) and ROE (Return on equity, measured by the ratio of net income to total equity, in percentage). The independent variables are ID (Income diversification as measured by the Herfindahl–Hirschman Index (HHI) using interest income, non-interest income and total income, in ratio), GD (Geographical diversification, measured by the number of branches, in number), PD (Product diversification, measured by the total number of deposit and loan products, in number), AD (Asset diversification, measured by Herfindahl–Hirschman Index (HHI) using loans, non-loan assets and total assets, in ratio), FD (Funding diversification, measured by Herfindahl–Hirschman Index (HHI) using equity, short-term interbank borrowing, deposits, subordinated term debt, short term money market borrowing or certificate of deposits and total funds, in ratio) and BD (Board diversification, measured by number of female directors, in number).

Variables	ROA	ROE	ID	GD	PD	AD	FD	BD
ROA	1							
ROE	.0596**	1						
ID	.0484**	0.220*	1					
GD	-0.064	-0.278**	-0.045	1				
PD	-0.01	-0.237*	-0.063	0.644**	1			
AD	0.089	0.406**	0.074	-0.101	-0.015	1		
FD	0.101	-0.378**	0.218*	0.078	-0.003	-0.374**	1	
BD	-0.254**	-0.445**	-0.005	0.288**	0.254**	-0.116	0.262**	1

Note: The asterisk signs (*) and (**) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows the correlation between the dependent and independent variables of the study. It

shows that income diversification has significant positive association with return on assets, suggesting that increase in the level of income diversification tends to increase the return on assets of Nepalese commercial banks. However, the table demonstrates that geographical diversification negatively impacts the return on assets as seen in the table. It clarifies that growing number of geographical diversification lowers return on assets. Similarly, product diversification and return on assets are negatively related stating that return on assets decreases with the increase in the level of product diversification. In contrast, asset diversification is positively related with return on assets signifying that increase in diversity of assets increases the level of return on assets. Likewise, funding diversity also positively impacts return on assets suggesting that increase in diversity of funding tends to increase return on assets. However, board diversification is negatively associated with return on assets, defining that increase in the number of female directors diminishes the return on assets.

Similarly, the result also shows that income diversification has significant positive association with return on equity, suggesting that increase in the level of income diversification tends to increase the return on equity of Nepalese commercial banks. However, the table demonstrates that geographical diversification negatively impacts the return on equity as seen in the table. It clarifies that growing number of geographical diversification lowers return on equity. Similarly, product diversification and return on equity are negatively related stating that return on equity decreases with the increase in the level of product diversification. In contrast, asset diversification is positively related with return on equity signifying that increase in diversity of assets increases the level of return on equity. However, funding diversity negatively impacts return on equity suggesting that increase in diversity of funding tends to decrease return on equity. Similarly, board diversification is negatively associated with return on equity, defining that increase in the number of female directors diminishes the return on equity.

Regression Analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of income diversification, geographical diversification, product diversification, asset diversification, funding diversification, board diversification and return on asset of Nepalese commercial banks.

Table 4

Estimated regression results of income diversification, geographical diversification, product diversification, asset diversification, funding diversification and board diversification with return on asset of Nepalese commercial banks

The outcomes are based on panel data of 12 commercial banks with 108 observations for the period of 2014-15 to 2022-23 by using the linear regression model and the model is $ROA_{it} = \beta_0 + \beta_1 ID + \beta_2 GD_{it} + \beta_3 PD_{it} + \beta_4 AD_{it} + \beta_5 FD_{it} + \beta_6 BD_{it} + e_{it}$ where, dependent variable is ROA (Return on assets, measured by the ratio of net income to total asset, in percentage). The independent variables are ID (Income diversification as measured by the Herfindahl–Hirschman Index(HHI) using interest income, non-interest income and total income, in ratio), GD (Geographical diversification, measured by the number of branches, in number), PD (Product diversification, measured by the total number of deposit and loan products, in number), AD (Asset diversification, measured by Herfindahl–Hirschman Index (HHI) using loans, non-loan assets and total assets, in ratio), FD (Funding diversification, measured by Herfindahl–Hirschman Index (HHI) using equity, short-term interbank borrowing, deposits, subordinated term debt, short term money market borrowing or certificate of deposits and total funds, in ratio) and BD (Board diversification, measured by number of female directors, in number).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		ID	GD	PD	AD	FD	BD			
1	1.104 (8.768)**	2.824 (5.689)**						0.227	0.44	32.36
2	1.68 (17.446)**		0.001 (0.659)					0.005	0.502	0.434
3	1.637 (13.968)**			0.001 (0.918)				0.009	0.503	0.011
4	1.054 (1.687)				1.349 (0.917)			0.001	0.501	0.841
5	1.412 (6.725)**					0.915 (1.004)		0.001	0.501	1.091
6	1.742 (27.42)**						-0.237 (2.707)**	0.056	0.487	7.325
7	1.052 (7.518)**	2.840 (5.893)**	0.001 (0.493)					0.221	0.442	16.185
8	0.357 (0.451)			0.001 (0.076)	2.236 (1.410)	1.415 (1.496)		0.001	0.501	1.03
9	0.890 (1.621)	2.840 (5.893)**		0.002 (1.055)	0.344 (0.273)		-0.253 (3.183)**	0.278	0.426	11.324
10	0.547 (0.807)	2.680 (5.332)**	0.001 (0.420)		0.344 (0.273)	0.915 (1.058)	-0.261 (3.144)**	0.272	0.428	8.984
11	0.499 (0.734)	2.697 (5.368)**	0.001 (0.339)	0.003 (1.082)	0.862 (0.626)	0.915 (1.058)	-0.271 (3.248)**	0.273	0.427	7.694

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. ROA is the dependent variable.

Table 4 shows that the beta coefficients between income diversification and ROA is positive, showcasing the positive significant impact of income diversification on return on assets of commercial banks in Nepal. This finding illustrates the similar findings of Ndungu and Muturi (2019). Similarly, the beta coefficients between geographical diversification and ROA is also positive, displaying the positive affect of geographical diversification on return of assets of Nepalese commercial banks. The findings of from this study has the similarity with findings of Njuguna (2018). Likewise, positive beta coefficients can be seen between product diversification and ROA as well, which explains the positive influence of product diversification on return on assets of commercial banks in Nepal. This outcome is consistent with the findings of Maina (2013). Also, the table demonstrates the positive beta coefficients between asset diversification and ROA. This explains that return on assets of Nepalese commercial banks are positively powered by assets diversification. This finding is consistent with the finding of Chu et al. (2021). In the same way, there can be seen the positive beta coefficients between funding diversification and ROA, exhibiting the idea that funding diversification drives return on assets positively. This finding is similar to the findings of Abbas et al. (2021). In contrast, negative beta coefficients can be seen in the table between board diversification and ROA, elaborating that board diversification impacts return on assets of Nepalese commercial banks negatively. This finding contradicts with the finding of Tumewang et al. (2024) where the authors stated that board diversity exerts positive influence in bank profitability.

Table 5 shows the regression results of income diversification, geographical diversification, product diversification, asset diversification, funding diversification, board diversification and return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of income diversification, geographical diversification, product diversification, asset diversification, funding diversification and board diversification with return on equity of nepalese commercial banks

The outcomes are based on panel data of 12 commercial banks with 108 observations for the period of 2014-15 to 2022-23 by using the linear regression model and the model is $ROE_{it} = \beta_0 + \beta_1 ID + \beta_2 GD_{it} + \beta_3 PD_{it} + \beta_4 AD_{it} + \beta_5 FD_{it} + \beta_6 BD_{it} + e_{it}$ where, dependent variable is ROE (Return on equity, measured by the ratio of net income to total equity, in percentage). The independent variables are ID (Income diversification as measured by the Herfindahl–Hirschman Index(HHI) using interest income, non-interest income and total income, in ratio), GD (Geographical diversification, measured by the number of branches, in number), PD (Product diversification, measured by the total number of deposit and loan products, in number), AD (Asset diversification, measured by Herfindahl–Hirschman Index (HHI) using loans, non-loan assets and total assets, in ratio), FD (Funding diversification, measured by Herfindahl–Hirschman Index (HHI) using equity, short-term interbank borrowing, deposits, subordinated term debt, short term money market borrowing or certificate of deposits and total funds, in ratio) and BD (Board diversification, measured by number of female directors, in number).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		ID	GD	PD	AD	FD	BD			
1	12.397 (9.953)**	12.447 (2.327)*						0.004	4.746	5.414
2	17.405 (19.420)**		-0.016 (2.982)**					0.069	4.674	8.890
3	17.405 (19.420)**			-0.060 (2.517)*				0.048	4.727	6.336
4	-10.173 (1.836)				59.678 (4.572)**			0.157	4.447	20.907
5	22.823 (12.083)**					-33.153 (4.204)**		0.135	4.505	17.667
6	17.058 (29.994)**						-4.003 (5.114)**	0.190	4.358	26.151
7	14.954 (9.274)**	11.653 (2.223)*		-0.056 (2.419)*				0.082	4.641	5.758
8	-3.925 (0.764)		-0.008 (1.658)		51.433 (4.359)**		-3.282 (4.374)**	0.324	3.983	18.065
9	-5.441 (1.075)	10.612 (2.409)*	-0.007 (1.596)		49.457 (4.277)**		-3.308 (4.510)**	0.353	3.894	15.626
10	5.834 (0.920)	13.932 (3.146)**	-0.007 (1.215)	-0.034 (1.3)	36.334 (2.821)**	-29.175 (3.721)**		0.320	3.995	11.052
11	4.747 (0.793)	13.932 (3.146)**	-0.004 (0.738)	-0.024 (0.952)	36.554 (3.010)**	-22.263 (2.920)**	-2.728 (3.710)**	0.395	3.766	12.657

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- ROE is the dependent variable.

Table 5 shows that the beta coefficients between income diversification and ROE is positive, showcasing the positive significant impact of income diversification on return on equity of commercial banks in Nepal. This finding illustrates the similar findings of Edirisuriya et al. (2015). In the hindsight, the beta coefficients between geographical diversification and ROE is negative, displaying the negative affect of geographical diversification on return of equity of Nepalese commercial banks. The findings of from this study contradicts with the findings of Zoghlami (2020). Similarly, negative beta coefficients can be seen between product diversification and ROE as well, which explains the negative influence of product diversification on return on equity of commercial banks in Nepal. This outcome is consistent with the findings of James et al. (2023). Likewise, the table exhibits the positive beta coefficients between asset diversification and ROE. This explains that return on equity of Nepalese commercial banks are positively powered by assets diversification. This finding is consistent with the finding of Obaro et al. (2022). However, there can be seen the negative beta coefficients between funding diversification and ROE, exhibiting the idea that funding diversification drives return on equity negatively. This finding is similar to the findings of Duong et al. (2023). Similarly, negative beta coefficients can be seen in the table between board diversification and ROE, elaborating that board diversification impacts return on equity of Nepalese commercial banks negatively. This finding contradicts with the finding of Thagunna et al. (2024) where the authors stated that board diversity exerts positive influence in bank profitability measured by both ROA and ROE.

4. Summary and conclusion

Commercial banks are the most dynamic financial intermediaries, fulfilling vital financial roles in a variety of global economies. They transfer risk, deal with intricate financial products and markets, offer payment mechanisms, promote market transparency, balance supply and demand in financial markets, and manage risk. Commercial banks are one of the most profitable institutions as they take risks of similar level as well. profitability is the main target for policymakers, bank authorities and shareholders in banking industry, as profitability resembles the effectiveness and efficiency of management which helps to generate profit with optimal utilization of resources. So, in order to be profitable, they also need to diversify their activities, products, assets and sources.

This study attempts to examine the effect of diversification on profitability of Nepalese commercial banks. The study is based on secondary data of 12 Nepalese commercial banks with 108 observations for the period from 2014-15 to 2022-23.

The major conclusion of this study is that various diversification strategies drive the profitability of Nepalese commercial banks. As referred by the study, it can be concluded that income diversification, followed by board diversification are the most persuading diversification strategies towards manipulation of ROA of Nepalese commercial banks. Similarly, board diversification, followed by asset diversification are the most persuading diversification strategies to influence ROE of commercial banks in Nepal. In conclusion, diversification of income, geography, product, asset, funding and board influence the profitability of Nepalese commercial banks.

References

- Abbas, F., and S. Ali, 2022. Dynamics of diversification and banks' risk-taking and stability: Empirical analysis of commercial banks. *Managerial and Decision Economics* 43(4), 1000-1014.
- Acharya, V. V., I. Hasan, and A. Saunders, 2006. Should banks be diversified? Evidence from individual bank loan portfolios. *The Journal of Business* 79(3), 1355-1412.
- Ahsan, A. M., 2012. Can ROE be used to predict portfolio performance?. *Economics, Management, and Financial Markets* 7(2), 132-148.
- Aissa, S. B., and M. Goaied, 2016. Determinants of Tunisian hotel profitability: The role of managerial efficiency. *Tourism Management* 52, 478-487.
- Al-Khouri, R., and H. Arouri, 2019. The effect of diversification on risk and return in banking sector: Evidence from the Gulf Cooperation Council countries. *International Journal of Managerial Finance* 15(1), 100-128.
- Amidu, M., and S. Wolfe, 2013. Does bank competition and diversification lead to greater stability? Evidence from emerging markets. *Review of Development Finance* 3(3), 152-166.
- Batool, S., and F. Jamil, 2019. Rural employment and income diversification in Pakistan. *Pakistan Journal of Agricultural Sciences* 56(2).
- Berger, A. N., and C.H. Bouwman, 2009. Bank liquidity creation. *The review of financial studies* 22(9), 3779-3837.
- Berger, A., I. Hasan, and M. Zhou, 2010. The effects of focus versus diversification on bank performance: Evidence from Chinese Banks. *Journal of Banking and Finance* 34, 1417-1435.
- Brahmana, R., M. Kontesa, and R.E. Gilbert, 2018. Income diversification and bank performance: evidence from Malaysian banks. *Economics Bulletin* 38(2), 799-809.
- Brighi, P., and V. Venturelli, 2013. The effect of revenue and geographic diversification on bank performance.

CEFIN WORKING PAPERS 43, 1-32.

- Budhathoki, P. B., and C.K. Rai, 2020. The effect of specific factors on bank profitability: Evidence from Nepalese banks. *Journal of Economics and Business* 3(1), 82-89.
- Cheng, P., and S.E. Roulac, 2007. Measuring the Effectiveness of Geographical Diversification. *Journal of Real Estate Portfolio Management* 13(1), 29-44.
- Chu, S. H., S. Li, X. Xia, X. Liu, J. Li, and S. Zhang, 2021. Bank Diversification and Performance: The Role of Financial Stability. *Advances in Economics, Business and Management Research* 178. 38-43.
- Cotugno, M., and V. Stefanelli, 2010. Bank intermediation models and portfolio default rates. What's the relation?. *23rd Australasian Banking and Finance Conference*, 1-14.
- Damankah, B. S., O. Anku-Tsedde, and M. Abubakar, 2015. Income Diversification and Financial Stability of Banks in Ghana. *International Journal of Business and Social Science* 6(6), 177-184.
- Damodaran, A. (2014), *Applied corporate finance*. John Wiley & Sons.
- Deng, S., E. Elyasiani, and C.X. Mao, 2007. Diversification and the cost of debt of bank holding companies. *Journal of Banking & Finance* 31(8), 2453-2473.
- Duong, K. D., P.M.D. Tran, P.Y.N. Nguyen, and H. Pham, 2023. How do funding diversity and non-performing loans affect bank performance in different economic cycles?. *Cogent Business & Management* 10(2), 2215076.
- Ebrahim, A., and I. Hasan, 2008. The value relevance of product diversification in commercial banks. *Review of Accounting and Finance* 7(1), 24-37.
- Edirisuriya, P., A. Gunasekarage, and M. Dempsey, 2015. Australian specific bank features and the impact of income diversification on bank performance and risk. *Australian Economic Papers* 54(2), 63-87.
- Elsas, R., A. Hackethal, and M. Holzhäuser, 2010. The anatomy of bank diversification. *Journal of Banking & Finance* 34(6), 1274-1287.
- Engida, B., 2023. The Effect of Asset Diversification on Profitability of Commercial Banks in Ethiopia.
- Flamini, V., C.A. McDonald, and L.B. Schumacher, 2009. The determinants of commercial bank profitability in Sub-Saharan Africa.
- Fresno, M., and D. Hanggraeni, 2020. Impact of diversification on systemic risk of conventional banks listed on the Indonesia Stock Exchange. *Banks and Bank Systems* 15(4), 80-87.
- Gambacorta, L., M. Scatigna, and J. Yang, 2014. Diversification and bank profitability: a nonlinear approach. *Applied economics letters* 21(6), 438-441.
- Githaiga, P. N. 2022. Revenue diversification and financial sustainability of microfinance institutions. *Asian Journal of Accounting Research* 7(1), 31-43.
- Goddard, J., D. McKillop, and J.O. Wilson, 2008. The diversification and financial performance of US credit unions. *Journal of banking & finance* 32(9), 1836-1849.
- Gurbuz, A. O., S. Yanik, and Y. Ayturk, 2013. Income diversification and bank performance: Evidence from the Turkish banking sector. *Journal of BRSA Banking and Financial Market* 7(1), 9-29.
- Hamdi, H., A. Hakimi, and K. Zaghdoudi, 2017. Diversification, bank performance and risk: have Tunisian banks adopted the new business model?. *Financial innovation* 3, 1-25.
- Hayden, E., D. Porath, and N.V. Westernhagen, 2007. Does diversification improve the performance of German banks? Evidence from individual bank loan portfolios. *Journal of financial services research* 32, 123-140.

- Hoogendoorn, S., H. Oosterbeek, and M. van Praag, 2013. The impact of gender diversity on the performance of business teams: Evidence from a field experiment. *Management science* 59(7), 1514-1528.
- Huang, R., and L. Ratnovski, 2008. The dark side of bank wholesale funding. Wharton Financial Institutions Center. *Working paper*. 8–40.
- Hughes, J. P., W.W. Lang, L.J. Mester, and C.G. Moon, 1999. The dollars and sense of bank consolidation. *Journal of banking & finance* 23(2). 291-324.
- Iskandar-Datta, M., and R. McLaughlin, 2007. Global diversification: New evidence from corporate operating performance. *Corporate Ownership and Control* 4, 228–250.
- James, M. W., N. Rintari, and W. Muema, 2023. Influence of Product Diversification on Financial Performance of Microfinance Institutions in Nairobi County, Kenya. *International Journal of Finance* 8(2), 88-101.
- Jouda, S. 2018. Diversification, capital structure, and profitability: A panel VAR approach. *Research in International Business and Finance* 45, 243-256.
- Kenyoru, D., G. Chumba, S. Chumba, M. Finance, and S.C. Rotich, 2016. Effect of Product Diversification on Financial Performance of Selected Banks in Kericho Town. *European Journal of Business and Management* 8(22), 126-134.
- Klein, P., and M. Saidenberg, 1998. Diversification, organization, and efficiency: Evidence from bank holding companies. Working paper Federal Reserve Bank of New York.
- Laeven, L., and R. Levine, 2007. Is there a diversification discount in financial conglomerates? *Journal of Financial Economics* 85, 331–367.
- Maina, J. K. 2013. The effect of product diversification on the financial performance of micro finance companies in Kenya. Doctoral dissertation, University of Nairobi.
- Makokha, A., G. Namusonge, and M. Sakwa, 2016. Effect of Portfolio Diversification on Commercial Banks Financial Performance in Kenya. *European Journal of Business Management* 5(9), 5-8.
- Mercieca, S., K. Schaeck, and S. Wolfe, 2007. Small European banks: Benefits from diversification?. *Journal of Banking & Finance* 31(7), 1975-1998.
- Mochabo, I. M., K.B.M. Ombaba, and B.A. Ondiek, 2017. Effect of bank diversification on the financial distress of commercial banks listed at the Nairobi Securities Exchange, Kenya. *International Journal of Scientific Research and Management* 5(11), 7329-7343.
- Mokaya M. A., and A. Jagongo, 2014. Corporate loan portfolio diversification and credit risk management among commercial banks in Kenya. *International Journal of Current Business and Social Sciences* 1(2), 20-32.
- Moudud-Ul-Huq, S., B.N. Ashraf, A.D. Gupta, and C. Zheng, 2018. Does bank diversification heterogeneously affect performance and risk-taking in ASEAN emerging economies?. *Research in International Business and Finance* 46, 342-362.
- Ndungu, J. G., and W. Muturi, 2019. Effect of diversification on financial performance of commercial banks in Kenya. *International journal of current aspects* 3(5), 267-285.
- Neupane, B.P. 2020. Profitability determinants of Nepalese commercial banks. *PressAcademia procedia* 12(1), 40-45.
- Njuguna, V. N. 2018. Influence of diversification strategies on performance of non-financial Firms Listed at the Nairobi Securities Exchange in Kenya. *International Journal of Education and Research* 6(6), 157-168.
- Obaro, V. C., A.C. Onuorah, H.O. Evesi, and V.C. Ehiedu, 2022. Diversification and the performance of quoted banks in Nigeria. *Quest Journal of Research in Business and Management* 10(10), 46-54.

- Olarewaju, O. M. 2018. Income Diversification in Low Income SubSaharan African Countries' Commercial Banks: A "Blessing" or "Curse"? *Folia Oeconomica Stetinensia* 18(2), 90-105.
- Osifo, O., and E.I. Evbayiro-Osagie, 2020. Foreign diversification and performance of quoted deposit money banks in selected Sub-Sahara African countries. *Oradea Journal of Business and Economics* 5(special), 82-93.
- Phung, D. N., and A.V. Mishra, 2016. Corporation Diversification and Firm Performance: Evidence from Vietnamese Listed Firms. *Australian Economic Papers* 55(4), 386-408.
- Pisedtasalasai, A., and P. Edirisuriya, 2020. Diversification and performance of Sri Lankan banks. *The Journal of Asian Finance, Economics and Business* 7(9), 1-10.
- Prajapati, R., and A.K. Shah, 2019. Effect of income diversification on risk-adjusted profitability of commercial and development banks in Nepal. *Journal of Business and Social Sciences Research* 4(2), 35-51.
- San, O. T., and T.B. Heng, 2013. Factors affecting the profitability of Malaysian commercial banks. *African Journal of Business Management* 7(8), 649-660.
- Sarwar, B., N. Muhammad, and N.U. Zaman, 2020. Diversification, industry concentration, and bank margins: Empirical evidence from an emerging south Asian economy. *The Journal of Asian Finance, Economics and Business* 7(7), 349-360.
- Shahu, D. 2022. Effect of Revenue Diversification on Financial Performance and Risk of Banks: Evidence from Nepali Commercial Banks.
- Sharma, S., and A. Anand, 2018. Income diversification and bank performance: evidence from BRICS nations. *International Journal of Productivity and Performance Management* 67(9), 1625-1639.
- Sissy, A. M., M. Amidu, and J.Y. Abor, 2017. The effects of revenue diversification and cross border banking on risk and return of banks in Africa. *Research in International Business and Finance* 40, 1-18.
- Stiroh, K. J. 2004. Do community banks benefit from diversification?. *Journal of Financial Services Research* 25, 135-160.
- Tan, B. R., and A. Chintakananda, 2016. The effects of home country political and legal institutions on firms' geographic diversification performance. *Global Strategy Journal* 6(2), 105-123.
- Thagunna, P., P. Thakuri., R. Thapa, R.K. Chaudhary, R. Dahal, and R.K. Das, 2024. Corporate Governance and Organizational Growth: A Case of Nepalese Commercial Banks. *Nepalese Journal of Finance* 11(2), 112-130.
- Tumewang, Y. K., F. Fakhrunnas, and K.P. Ardiami, 2024. The impact of bank's diversity and inclusion index on profitability: Evidence from Indonesia and Malaysia. *Journal of Contemporary Accounting* 6(1), 42-52.
- Turkmen, S., and I. Yigit, 2012. Diversification in Banking and its Effect on Banks' Performance: Evidence from Turkey. *American International Journal of Contemporary Research* 2(12), 111-119.
- Ujunwa, A. 2012. Board characteristics and the financial performance of Nigerian quoted firms. *Corporate Governance: The international journal of business in society* 12(5), 656-674.
- Winton, A. 1999. Don't put all your eggs in one basket? Diversification and specialization in lending. University of Minnesota. Working paper.
- Zoghلامي, F. 2020. Geographical Diversification Effects on Banks' Performance: Evidence from Islamic Banks of some Selected Countries. *Journal of Accounting, Business and Management (JABM)* 27(2), 15-29.

Chapter 30

Effect of employee cost and employee size on profitability of Nepalese commercial banks

- Bhabana Koirala and Sumit Pradhan*

Abstract

This study examines the effect of employee cost and employee size on the profitability of Nepalese commercial banks. Return on assets and return on equity are the selected dependent variables. The selected independent variables are number of employees, salary expenses, training and development expenses, employee bonus, employee allowances and employee insurance. The study is based on secondary data of 13 commercial banks with 104 observations for the study period from 2015/16 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB), annual report and audited financial statement of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of employee cost and employee size on the profitability of Nepalese commercial banks.

The study showed that number of employees has a negative impact on return on assets and return on equity. It indicates that increase in number of employees leads to decrease in return on assets and return on equity. Likewise, salary expenses have negative impact on return on assets and return on equity. It indicates that increase in salary expenses leads to decrease in return on assets and return on equity. In contrast, training and development expenses have positive impact on return on assets and return on equity. It indicates that increase in training and development expenses leads to increase in return on assets and return on equity. Further, employee bonus has a negative impact on return on assets and return on equity. It indicates that increase in employee bonus leads to decrease in return on assets and return on equity. Furthermore, employee allowances have negative impact on return on assets and return on equity. It indicates that increase in employee allowances leads to decrease in return on assets and return on equity. Additionally, employee insurance has a negative impact on return on assets and return on equity. It indicates that increase in employee insurance leads to decrease in return on assets and return on equity.

Keywords: number of employees, salary expenses, training and development expenses, employee bonus, employee allowances and employee insurance, return on assets, return on equity

1. Introduction

In the contemporary corporate landscape, human capital is acknowledged as a vital source of competitive advantage. As the knowledge economy expands, organizations increasingly regard their personnel as important assets and spend significantly in their development. Information on human capital and its growth is essential for financial analysts and fund managers, who must assess the future potential and worth of firms. According to Sharma (2012), an individual's profits are predominantly influenced by their stock of human capital. Consequently, evaluating business success may be inadequate without accounting for the value of human capital. Employees are the most critical and challenging resources inside the company. It is insufficient to only engage them; it is as vital to guarantee their efficiency in performing their duties. This can only be achieved via training and growth. Managers worldwide assert that training and development enhance employee performance and productivity inside organizations. Training and development guarantee that organizational members have the necessary knowledge and skills to do their duties successfully. Garrow (2004) asserted that offering training and development fosters a robust psychological connection between employees and their company, so reinforcing their commitment and improving organizational cohesiveness. Staff expenses constitute a substantial segment of the overall operating costs for banks, including salaries, allowances, provident fund contributions, training costs, uniforms, medical insurance, pensions, gratuity contributions, and additional expenses such as post-employment and termination benefits. These expenses directly

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influence the overall profitability of banks and are frequently utilized as measures of management's efficacy in cost control. Certain managers presume a negative correlation between net profit and personnel expenses, leading them to conclude that reducing these costs will enhance profitability. This viewpoint corresponds with the expenditure preference theory, which posits that companies may want to fulfill their goals by augmenting pay and fringe benefits. Agency theory, however, presents a counterargument, suggesting that, elevated compensation and perks augment the firm's agency costs, which employers inherently strive to avoid. Ojeleye (2017) posits that when employees see a correlation between their additional efforts and financial incentives, their motivation to enhance performance increases, since these monetary advantages satisfy their physiological requirements. If employees do not get sufficient financial advantages, they may be motivated to depart the firm in pursuit of superior prospects, as shown by Nzyoka and Orwa (2016).

Boateng (2019) investigated the relationship between efficiency, productivity and profitability of Ghanaian banks. The study indicated that profit per employee has the positive impact on the profitability of banks. Domanovic *et al.* (2018) inspected the internal factors that influence the profitability of banks in the Republic of Serbia. The study determined that there is a detrimental correlation between the profitability of a bank and its capital adequacy ratio. The study also determined that profitability of a bank is positively correlated with its magnitude and employee count. Likewise, Kevser (2021) conducted an analysis of the correlation between the profitability ratios of banks operating in Borsa Istanbul (BIST) and their scale. The study found that the number of employees and the return on equity have a positive relationship. Similarly, Fonseca *et al.* (2022) conducted a study on the profitability and scale of newly established firms. The study determined that profitability (as measured by return on assets) is positively correlated with firm size (as measured by the number of employees).

Iloska (2014) explored the factors that affect bank profitability in Macedonian banks. The study found that the profitability of banks is adversely affected by operating expenses and loan-loss provisions. The study also determined that profitability is positively influenced by staff expenses, bank size and the proportion of loans in total assets. Likewise, Berhani and Sejdini (2016) investigated the factors that influence the profitability of Albanian banks by concentrating on the correlation between staff salaries and bank profitability. The study found that that Albanian banks' profitability is substantially affected by numerous variables, including inflation, cost management, capital ratio and staff remuneration. Similarly, Le and Nguyen (2020) conducted a study on the influence of intellectual capital on the risk-adjusted returns of banks in Vietnam. The study concluded that the profitability of banks is positively influenced by intellectual capital, as measured by the value-added intellectual coefficient and its components, including human capital efficiency, capital employed efficiency, and structural capital efficiency. The study also found that staff compensation are a critical component of human capital efficiency. Bekhet *et al.* (2020) examined the influence of internal and external factors on the profitability of Jordanian commercial banks. The study found that internal variables, like bank size and diversity, had a beneficial impact on bank profitability. The study also revealed that external factors, like financial development and inflation, had a favorable and considerable influence on bank profitability. Likewise, the study also indicated that a well-structured staff bonus scheme might potentially augment profitability. Likewise, Chen (2020) analyzed the effects of promotional incentives on employee happiness and performance within Chinese commercial banks. The study found that promotional incentives significantly enhance the performance of Chinese commercial banks. Similarly, Nawangsari *et al.* (2022) examined the effect of the operating efficiency ratio and Islamic performance index on the financial performance of Islamic banking. The study showed that the operational efficiency ratio and profit-sharing ratio significantly harmed profitability, however the Islamic income ratio had no effect at all. The study also found that profitability (ROA) is significantly impacted negatively by the Operating Efficiency Ratio (OER). The study also found a negligible positive correlation between

profitability (ROA) and the Islamic Income Ratio.

Bogale (2019) examined a study on the profitability of private commercial banks in Ethiopia over a decade, from 2008 to 2017, utilizing unbalanced panel data from fourteen Ethiopian private commercial banks. The study found that bank-specific factors, capital adequacy and bank size, had a substantial positive influence on profitability. The study also found that operational efficiency has a significantly adverse impact on profitability. Likewise, Phan (2020) examined the determinants influencing the profitability of publicly traded commercial banks in Vietnam. The findings indicated that operating efficiency, loan size, retail loan ratio, state ownership, inflation rate and GDP growth positively influence profitability. Conversely, factors like capital size, credit risk, liquidity risk, bank size, and income diversification exhibit statistical insignificance. Similarly, Uddin (2022) explored the impact of non-performing loans on profitability, utilizing operational efficiency as a mediating variable. The study found that operational efficiency has a negative and minor influence on profitability, but non-performing loans demonstrate a negative and substantial impact on profitability in the context of operating efficiency. Khan and Maktoumi (2021) conducted an analysis of the efficacy of bank performances and looked at the relationships between asset management, bank size, operational efficiency, and the performance of the bank in Oman. The study found that the selected commercial banks' operational efficiency (OE) significantly affected their return on assets. The study also shown that ratio analysis, which may be a useful tool for evaluating bank financial performances, can be used to analyze the size, management, and equity of the banks' assets. Likewise, Krasniqi *et al.*, (2021) examined the effect of cost control on the profitability of Kosovo's commercial banks. The study found that the profitability metrics (Return on equity or Return on assets) are significantly impacted by human expenditures. Similarly, Mehzabin *et al.* (2022) examined the impact of long-term debt, operating efficiency, non-interest income, and capital structure as measured by the leverage ratio on the profitability of the banking sector in 28 Asian nations. The results of the study showed that the profitability of the banking industry is positively and significantly influenced by the leverage ratio, non-interest income, operating efficiency, and capital ratio.

In the context of Nepal, Budhathoki and Rai (2018) demonstrated that Nepalese commercial banks cannot enhance net profit by augmenting staff salaries and contended that banks should reduce personnel expenditures to boost net profit. Operational profit and net profit are distinct metrics for assessing profitability. Training and development expenses are a segment of personnel costs, which are a significant component of operating expenditures. Likewise, Pandey (2017) asserts that the frequency and depth of training significantly influence organizational performance in Nepalese commercial banks, with institutions prioritizing formal training exhibiting superior performance relative to those depending on informal approaches. Similarly, Neupane (2020) evaluated the determinants of profitability in Nepalese commercial banks. The research indicated that operating efficiency has a significantly negative correlation with return on assets. Furthermore, Gautam (2020) examined the financial performance analysis of Nepalese financial institutions in the framework of CAMEL. The study demonstrated that profitability has a negative and substantial correlation with operational efficiency.

The above discussion reveals that the empirical evidences vary greatly across the studies on the effect of employee cost and employee size on banks profitability. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of this study is to examine the effect of employee cost and employee size on the profitability of Nepalese commercial banks. Specifically, it examines the effect of number

of employees, salary expenses, training and development expenses, employee bonus, employee allowances and employee insurance on the profitability of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were gathered from 13 Nepalese commercial banks from 2015/16 to 2022/23, leading to a total of 105 observations. The study employed convenience sampling method. The main sources of data collected from are the Bank Supervision Report published by Nepal Rastra Bank (NRB), annual report and audited financial statement of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of commercial banks	Study period	Observations
Public Banks			
1.	Agricultural Development Bank Limited	2015/16-2022/23	8
2.	Rastriya Banijaya Bank Limited	2015/16-2022/23	8
Joint Venture Banks			
3.	NMB Bank Limited	2015/16-2022/23	8
4.	Everest Bank Limited	2015/16-2022/23	8
Private Banks			
5.	Machhapuchchhre Bank Limited	2015/16-2022/23	8
6.	Himalayan Bank Limited	2015/16-2022/23	8
7.	Prabhu Bank Limited	2015/16-2022/23	8
8.	Prime Commercial Bank Limited	2015/16-2022/23	8
9.	Siddhartha Bank Limited	2015/16-2022/23	8
10.	Nepal SBI Bank Limited	2015/16-2022/23	8
11.	Citizens International Bank Limited	2015/16-2022/23	8
12.	Sanima Bank Limited	2015/16-2022/23	8
13.	Standard Chartered Bank Nepal Limited	2015/16-2022/23	8
Total number of observations			104

Source: Annual reports

Thus, the study is based on 104 observations.

The model

The model used in this study assumes that profitability of banks depends upon employee cost and employee size. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are number of employees, salary expenses,

training and development expenses, employee bonus, employee allowances and employee insurance. Therefore, the models take the following forms:

$$ROA_{it} = \beta_0 + \beta_1 NOE_{it} + \beta_2 SE_{it} + \beta_3 TDE_{it} + \beta_4 EB_{it} + \beta_5 EA_{it} + \beta_6 EI_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 NOE_{it} + \beta_2 SE_{it} + \beta_3 TDE_{it} + \beta_4 EB_{it} + \beta_5 EA_{it} + \beta_6 EI_{it} + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

NOE = Number of employees as measured by the head count, in number.

SE = Salary expenses as measured by the total salary expenses, Rs. in millions.

TDE = Training and development expenses as measured by the total training and development expenses, Rs. in millions.

EB = Employee bonus as measured by the total employee bonus, Rs. in millions

EA = Employee allowances as measured by the total employee allowances, Rs. in millions.

EI = Employee insurance as measured by the total employee insurance, Rs. in millions.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Number of employees

Number of employees refers to the total count of individuals employed by a commercial bank in Nepal. This includes all full-time and part-time employees across various departments and branches of the bank. Mariette (2022) examined factors influencing the performance of commercial banks of Kenya: Case of Equity Banks. The study found that number of employees have a negative relationship with performance of bank. Likewise, Chitai *et al.* (2022) examined e-Banking strategies and financial performance of commercial banks in Kenya. The study found that there is the significant and negative relationship between number of employees and bank profitability. Similarly, Nuwagaba and Tusubira (2023) examined financing alternatives for sustainable growth of micro, small and medium scale enterprises in Uganda. The study found that number of staff in bank has the negative impact on the profitability of bank. Further, Ekesiba (2024) examined employment casualization in Nigerian banks and its implication on human resource management practices. The study found that there is the negative relationship between number of employees and profitability. Furthermore, Inah and Agiabekong (2024) examined financial accounting information as an aid in management decision making of first bank Nigeria. The study found that there is the negative relationship between number of employees and bank profitability. Based on it, this study develops the following hypothesis:

H₁: There is a negative relationship between number of employees and profitability of bank.

Salary expenses

Salary expenses refer to the total monetary compensation paid by a commercial bank to its employees. This includes basic salaries, wages, bonuses, allowances, and any other financial benefits provided to employees for their services. Iloska (2014) examined an analysis of bank profitability in Macedonia. The study found that salary expenses have the negative impact on the performance

of the bank. Likewise, Onuonga (2014) examined the analysis of profitability of Kenya's top six commercial banks: Internal factor analysis. The study found that salary expenses have the negative impact on the profitability. Similarly, Berhani and Sejdini (2016) examined an empirical evaluation of the determinants of Albanian banks' profitability by focusing on the relationship between bank profitability and staff salary. The study found that salary expenses have negative relationship with banks profitability. Further, Abel and Le Roux (2016) examined the determinants of banking sector profitability in Zimbabwe. The study found that salary expenses have the significant and negative impact on the bank profitability. Furthermore, Krasniqi *et al.* (2021) examined the impact of cost control on the profitability of commercial banks. The study found that salary expenses have the negative relationship with profitability. Moreover, Mehzabin *et al.* (2023) examined the effect of capital structure, operating efficiency and non-interest income on bank profitability: New evidence from Asia. The study found that there is the negative relationship between employee expenses and the performance of bank. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between employee expenses and profitability of bank.

Training and development expenses

Training and development expenses refer to the total amount of money a commercial bank spends on activities aimed at improving the skills, knowledge, and capabilities of its employees. These expenses can include costs associated with internal and external training programs, workshops, seminars, courses, certifications, and other professional development activities. Bolanle *et al.* (2012) examined corporate social responsibility and profitability of Nigeria banks-a causal relationship. The study found that internal and external training expenses positively impact the bank profitability. Likewise, Ekwe (2013) examined the relationship between intellectual capitals and growth in revenue of deposit money banks in Nigeria. The study found that training and development have the positively impact on the bank profitability. Similarly, Gidado *et al.* (2014) examined investing in human resource development: Empirical evidence from banking institutions of Malaysia and Nigeria. The study found that there is the positive relationship between TandD with the performance of bank. Further, Sowunmi *et al.* (2015) examined human resource development as a correlate of performance of the banking industry in Ogun State, Nigeria. The study found that TandD of employees positively impact performance of bank. Furthermore, Boateng (2019) examined the relationship between efficiency, productivity and profitability of Ghanaian banks. The study found that there is the positive relationship between training and development and profitability. Moreover, Siddiqui and Ali (2023) examined impact of training and development on the profitability of the banking sector: A study on the leading banks of Pakistan. The study found that training and development positively impact on the performance of bank. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between training and development expenses and profitability of bank.

Employee bonus

Employee bonus refers to the additional compensation awarded to employees based on their performance, company performance, or other criteria set by the bank. This can include annual bonuses, performance bonuses, profit-sharing, and other incentive-based payments. Aduda and Musyoka (2011) examined the relationship between executive compensation and firm performance in the Kenyan banking sector. The study found that employee bonus negatively impact the performance of bank. Likewise, Bolanle *et al.* (2012) examined corporate social responsibility and profitability of Nigeria banks-a causal relationship. The study found that there is the negative relationship between employee

bonus and bank profitability. Similarly, Gidado *et al.* (2014) examined investing in human resource development: Empirical evidence from banking institutions of Malaysia and Nigeria. The study found that employee bonus have the negative relationship with return on assets. Further, Efig *et al.* (2015) examined incentive pay and bank risk-taking: Evidence from Austrian, German and Swiss banks. The study found that there is a negative relationship between employee bonus and bank profitability. Furthermore, Daudi (2021) examined performance-based rewards as a determinant of employee retention among tier-one commercial banks in Kenya. The study found that there is the significant and negative relationship between the bank profitability. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between employee bonus and profitability of bank.

Employee allowances

Employee allowances refer to additional financial benefits provided to employees on top of their regular salaries. These can include housing allowances, transportation allowances, meal allowances, medical allowances, and other forms of supplementary compensation designed to support employees' living and working conditions. Obieze (2018) examined impact of compensation management practice on employees' performance of selected banks in Delta State. The study found that there is the negative relationship between employee allowance and profitability. Likewise, Hamdan *et al.* (2018) examined employee benefits accounting, its impact on the market share price, the volume of credit facilities and deposits. The study found that allowances have the negative impact on the performance of banks. Similarly, Namutebi (2018) examined the contribution of financial rewards towards employee productivity at Stanbic Bank Uganda Ltd: A case of Nakasero Branch. The study found that there is the negative impact of employee allowance towards the bank's profitability. Further, Haris *et al.* (2019) examined intellectual capital performance and profitability of banks: Evidence from Pakistan. The study found that there is the negative relationship between allowances and profitability. Furthermore, Festus *et al.* (2024). Human resource accounting and banks profitability: Evidence from deposit money banks listed on the Nigerian exchange. The study found that employee allowances have the significant and negative relationship with the bank profitability. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between employee allowance and profitability of bank.

Employee insurance

Employee insurance is an important component of an employee's overall compensation package. Providing comprehensive insurance coverage can enhance employee satisfaction, well-being, and retention, which can, in turn, improve productivity and performance. Guruswamy and Marew (2017) examined profitability performance of selected insurance companies in Ethiopia. The study found that employee insurance has the negative impact on the bank profitability. Likewise, Nireesh and Silva (2018) examined nexus between corporate social responsibility disclosure and financial performance: Evidence from the listed banks, finance and insurance companies in Sri Lanka. The study found that there is the negative relationship between employee insurance and bank profitability. Similarly, Boateng (2019) examined the relationship between efficiency, productivity and profitability of Ghanaian banks. The study found that employee insurance has negatively impact the profitability. Further, Chideh and Sorayaei (2019) examined effective factors on life insurance profitability: Case study of Iranian insurance companies. The study found that there is the negative relationship between bank profitability and employee insurance. Furthermore, Eladly (2021) examined working capital management on profitability and earning assets of insurance industry in Egypt. The study found that

there is the negative relationship between employee insurance and profitability. Moreover, Dahmash *et al.* (2023) examined impact of earnings components on future profitability of banking and insurance companies in Jordan. The study found that employee insurance negatively impact the bank profitability. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between employee insurance and profitability of bank.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2015/16 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 13 Nepalese commercial banks for the study period from 2015/16 to 2021/22. The dependent variables are ROA (Return on assets is measured by the ratio of net income to total assets, in percentage), ROE (Return on equity is measured by the ratio of net income to total equity, in percentage). The independent variables are NOE (Number of employees as measured by the total employee count in the bank, in number), SE (Salary expenses as measured by the total salary expenses, Rs. in Millions), TDE (Training and development expenses as measured by the total training and development expenses, Rs. in Millions), EB (Employee bonus as measured by the total employee bonus, Rs. in Millions), EA (Employee allowances as measured by the total employee allowance, Rs. in Millions) and EI (Employee insurance as measured by the total employee insurance, Rs. in Millions).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.23	1.57	0.51
ROE	3.7	24.53	14.13	4.72
NOE	390	3439	1336.80	663.41
SE	7.92	9.2	8.65	0.26
TAD	6.2	7.85	7.10	0.36
EB	8.11	9	8.46	0.17
EA	5.93	9.33	8.40	0.63
EI	5.89	7.69	6.83	0.46

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 13 Nepalese commercial banks for the study period of 2015/16 to 2021/22. The dependent variables are ROA (Return on assets is measured by the ratio of net income to total assets, in percentage), ROE (Return on equity is measured by the ratio of net income to total equity, in percentage). The independent variables are NOE (Number of employees as measured by the total employee count in the bank, in number), SE (Salary expenses as measured by the total salary expenses, Rs. in Millions), TDE (Training and development expenses as measured by the total training and development expenses, Rs. in Millions), EB (Employee bonus as measured by the total employee bonus, Rs. in Millions), EA (Employee allowances as measured by the total employee allowance, Rs. in Millions) and EI (Employee insurance as measured by the total employee insurance, Rs. in Millions).

Variables	ROA	ROE	NOE	SE	TDE	EB	EA	EI
ROA	1							
ROE	0.525**	1						
NOE	-0.250*	-0.375**	1					
SE	-0.216*	-0.411**	0.799**	1				
TDE	0.008	0.267**	0.591**	0.595**	1			
EB	-0.246*	-0.041	0.211*	0.455**	0.267**	1		
EA	-0.318**	-0.239*	0.597**	0.434**	0.495**	0.179	1	
EI	-0.343**	-0.114	0.133	0.300**	0.175	0.084	0.300**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that the number of employees has a negative relationship with return on assets. It indicates that increase in number of employees leads to decrease in return on assets. Likewise, salary expense has a negative relationship with return on assets. It indicates that increase in salary expenses leads to decrease in return on assets. In contrast, training and development expenses has a positive relationship with return on assets. It indicates that increase in training and development expenses leads to increase in return on assets. Further, employee bonus has a negative relationship with return on assets. It indicates that increase in employee bonus leads to decrease in return on assets. Furthermore, employee allowances has a negative relationship with return on assets. It indicates that increase in employee allowances leads to decrease in return on assets. Additionally, employee insurance has a negative relationship with return on assets. It indicates that increase in employee insurance leads to decrease in return on assets.

On the other hand, the results show that the number of employees has a negative relationship with return on equity. It indicates that increase in number of employees leads to decrease in return on equity. Likewise, salary expense has a negative relationship with return on equity. It indicates that increase in salary expenses leads to decrease in return on equity. In contrast, training and development expenses has a positive relationship with return on equity. It indicates that increase in training and development expenses leads to increase in return on equity. Further, employee bonus has a negative relationship with return on equity. It indicates that increase in employee bonus leads to decrease in return on equity. Furthermore, employee allowances has a negative relationship with return on equity. It indicates that increase in employee allowances leads to decrease in return on equity. Additionally, employee insurance has a negative relationship with return on equity. It indicates that increase in employee insurance leads to decrease in return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of number of employees, salary expenses, training and development expenses, employee bonus, employee allowances and employee insurance on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of number of employees, salary expenses, training and development expenses, employee bonus, employee allowances and employee insurance on return on assets

The results are based on panel data of 13 commercial banks with 105 observations for the study period from 2015/16 to 2022/23 by using linear regression model. The model is $ROA_{it} = \beta_0 + \beta_1 NOE_{it} + \beta_2 SE_{it} + \beta_3 TDE_{it} + \beta_4 EB_{it} + \beta_5 EA_{it} + \beta_6 EI_{it} + e_{it}$ where, the dependent variables is ROA (Return on assets is measured by the ratio of net income to total assets, in percentage). The independent variables are NOE (Number of employees as measured by the total employee count in the bank, in number), SE (Salary expenses as measured by the total salary expenses, Rs. in Millions), TDE (Training and development expenses

as measured by the total training and development expenses, Rs. in Millions), EB (Employee bonus as measured by the total employee bonus, Rs. in Millions), EA (Employee allowances as measured by the total employee allowance, Rs. in Millions) and EI (Employee insurance as measured by the total employee insurance, Rs. in Millions).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		NOE	SE	TDE	EB	EA	EI			
1	5.224 (3.194)**	-0.422 (2.236) *						0.037	0.496	4.998
2	5.224 (3.194)**		-0.254 (3.391) **					0.092	0.492	11.495
3	1.491 (1.504)			0.011 (0.091)				0.249	8.132	35.493
4	4.139 (5.936)**				0.011 (0.091)			0.109	0.477	13.643
5	4.662 (1.921)*					-0.737 (2.568)**		0.052	0.493	6.593
6	1.824 (16.720)**						-0.001 (2.607)**	0.053	0.492	6.797
7	0.050 (3.176)**	-0.188 (0.922)	-0.221 (2.652)**					0.091	0.482	6.164
8	5.008 (3.265)**	-0.508 (2.262) **	-0.303 (3.561)**	0.461 (2.817) **				0.155	0.465	7.294
9	5.008 (3.265)**	-0.387 (1.733) *	-2.256 (3.034)**	0.461 (2.817) **	-0.269 (2.595)**			0.207	0.452	7.467
10	1.701 (0.804)	-0.772 (3.501) **	-0.253 (3.281)**	0.462 (3.091) **	-0.243 (2.571)**	-1.237 (4.574)**		0.335	0.413	11.361
11	1.573 (0.615)	-0.795 (2.344) *	-0.257 (2.875)**	0.461 (3.054) **	-0.240 (2.366)*	-1.246 (4.299)**	-1.166 (0.089)	0.328	0.415	9.373

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that beta coefficients for number of employee has negative with return on assets. It indicates that number of employee has a negative impact on return on assets. This finding is consistent with the findings of Ekesiba (2024). Likewise, beta coefficients for salary expenses has negative with return on assets. It indicates that salary expenses has a negative impact on return on assets. This finding is consistent with the findings of Krasniqi *et al.* (2021). Similarly, beta coefficients for training and development has positive with return on assets. It indicates that training and development expenses has a positive impact on return on assets. This finding is consistent with the findings of Boateng (2019). Further, beta coefficients for employee bonus has negative with return on assets. It indicates that employee bonus has a negative impact on return on assets. This finding is consistent with the findings of Efung *et al.* (2015). Furthermore, beta coefficients for employee allowances has negative with return on assets. It indicates that employee allowances has a negative impact on return on assets. This finding is consistent with the findings of Haris *et al.* (2019). Additionally, beta coefficients for employee insurance has negative with return on assets. It indicates that employee insurance has a negative impact on return on assets. This finding is consistent with the findings of Eladly (2021).

Table 5 shows the regression results of number of employees, salary expenses, training and development expenses, employee bonus, employee allowances and employee insurance on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of number of employees, salary expenses, training and development expenses, employee bonus, employee allowances and employee insurance on return on equity

The results are based on panel data of 13 commercial banks with 105 observations for the study period from 2015/16 to 2022/23 by using linear regression model. The model is $ROE_{it} = \beta_0 + \beta_1 NOE_{it} + \beta_2 SE_{it} + \beta_3 TDE_{it} + \beta_4 EB_{it} + \beta_5 EA_{it} + \beta_6 EI_{it} + e_{it}$ Where, The dependent variables is ROE (Return on equity is measured by the ratio of net income to total equity, in percentage). The

independent variables are NOE (Number of employees as measured by the total employee count in the bank, in number), SE (Salary expenses as measured by the total salary expenses, Rs. in Millions), TDE (Training and development expenses as measured by the total training and development expenses, Rs. in Millions), EB (Employee bonus as measured by the total employee bonus, Rs. in Millions), EA (Employee allowances as measured by the total employee allowance, Rs. in Millions) and EI (Employee insurance as measured by the total employee insurance, Rs. in Millions).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		NOE	SE	TDE	EB	EA	EI			
1	73.988 (5.127) **	-6.918 (4.151) **						0.136	4.384	17.218
2	26.609 (4.926) **		-1.843 (2.582) *					0.052	4.592	6.668
3	42.134 (4.786) **			3.945 (3.185) **				0.082	4.521	10.146
4	25.996 (3.815) **				-1.738 (1.745) *			0.019	4.671	3.045
5	7.023 (0.301)					-0.841 (0.305)		0.009	4.738	0.093
6	17.257 (17.409) **						-0.002 (3.517) **	0.009	4.476	12.371
7	73.391 (5.081) **	-6.112 (3.303) **	-0.759 (1.004)					0.136	4.384	9.114
8	73.491 (5.076) **	-5.366 (2.529) *	-0.569 (0.709)	1.149 (0.725)				0.132	3.493	6.223
9	74.681 (5.073) **	-5.135 (2.359) *	-0.481 (0.584)	1.211 (0.578)	-0.511 (0.507)			0.126	4.411	4.697
10	33.120 (1.505) *	-7.318 (3.187) **	-0.462 (0.575)	1.206 (0.776)	-0.367 (0.373)	-7.011 (2.491) *		0.169	4.299	5.195
11	45.417 (1.711)	-9.531 (2.709) **	-0.845 (0.912)	1.325 (0.847)	-0.063 (0.601)	-7.878 (2.621) **	-0.001 (0.831)	0.167	4.301	4.431

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Return on equity is the dependent variable.

Table 5 shows that beta coefficients for number of employee has negative with return on equity. It indicates that number of employees has a negative impact on return on equity. This finding is consistent with the findings of Inah and Agiabekong (2024). Likewise, beta coefficients for salary expenses have negative with return on equity. It indicates that salary expenses have a negative impact on return on equity. This finding is consistent with the findings of Mehzabin *et al.* (2023). Similarly, beta coefficients for training and development has positive with return on equity. It indicates that training and development expenses has a positive impact on return on equity. This finding is consistent with the findings of Siddiqui and Ali (2023). Further, beta coefficients for employee bonus have negative with return on equity. It indicates that employee bonus has a negative impact on return on equity. This finding is consistent with the findings of Daudi (2021). Furthermore, beta coefficients for employee allowances has negative with return on equity. It indicates that employee allowances have a negative impact on return on equity. This finding is consistent with the findings of Festus *et al.* (2024). Additionally, beta coefficients for employee insurance have negative with return on equity. It indicates that employee insurance has a negative impact on return on equity. This finding is consistent with the findings of Dahmash *et al.* (2023).

4. Summary and conclusion

Employees are the most important and the most difficult of all the resources in the organization. It is not enough to employ and utilize them, but it is equally important to ensure that they do their job efficiently. This can only be possible through training and development. Globally, managers believe that training and development contributes to the improvement of employees' performance and productivity in organization. That is to say, training and development helps to ensure that organizational members

have the knowledge and skills they need to perform jobs effectively.

This study attempts to examine the effect of employee size and employee cost on the profitability of commercial banks in Nepal. The study is based on secondary data of 13 commercial banks with 105 observations for the period from 2015/16 to 2022/23.

The major conclusion of this study is number of employees, salary expenses, employee bonus, employee allowances and employee insurance have a negative relationship with return on assets. It indicates that increases in number of employees, salary expenses, employee bonus, employee allowances and employee insurance leads to decrease in return on assets. Whereas, training and development expenses have a positive relationship with return on assets. It indicates that increase in training and development expenses leads to increase in return on assets. Furthermore, the study also shows that number of employees, salary expenses, employee bonus, employee allowances and employee insurance have a negative relationship with return on equity. It indicates that increases in number of employees, salary expenses, employee bonus, employee allowances and employee insurance leads to decrease in return on equity. Whereas, training and development expenses have a positive relationship with return on equity. It indicates that increase in training and development expenses leads to increase in return on equity.

References

- Abel, S., and P. Le Roux, 2016. Determinants of banking sector profitability in Zimbabwe. *International Journal of Economics and Financial Issues* 6(3), 845-854.
- Aduda, J., and L. Musyoka, 2011. The relationship between executive compensation and firm performance in the Kenyan banking sector. *Journal of Accounting and Taxation* 3(2), 34-45.
- Bekhet, H. A., A. M. Alsmadi, and M. Khudari, 2020. Effects of internal and external factors on profitability of Jordanian commercial banks: Panel data approach. *International Journal of Financial Research* 11(5), 359-375.
- Berhani, R., and A. Sejdini, 2016. An empirical evaluation of the determinants of Albanian banks' profitability by focusing on the relationship between bank profitability and staff salary. *International Journal of Economics, Commerce and Management* 4(2), 56-70.
- Boateng, K. 2019. The relationship between efficiency, productivity and profitability of Ghanaian banks. *IOSR Journal of Business and Management* 21(6), 42-60.
- Bogale, Y. W., 2019. Factors affecting profitability of banks: empirical evidence from Ethiopian private commercial banks. *Journal of Investment and Management* 8(1), 8-15.
- Bolanle, A. B., S. O. Adebisi, and A. A. Muyideen, 2012. Corporate social responsibility and profitability of Nigeria banks-a causal relationship. *Research Journal of Finance and Accounting* 3(1), 34-45.
- Budhathoki, P. B., and C. K. Rai, 2018. Staff expenses and its effect on the bank's net profit. *Researcher: A Research Journal of Culture and Society* 3(3), 63-71.
- Chen, Z., (2020). Promotion incentive, employee satisfaction and commercial bank performance. *Open Journal of Social Sciences* 8(04), 108-115.
- Chideh, O. A., and A. Sorayaei, 2019. Effective factors on life insurance profitability: Case study of Iranian insurance companies. *Open Journal of Business and Management* 7(3), 34-50.
- Chitai, W., L. Wangari, B. Kamau, and J. Mutua, 2022. E-Banking strategies and financial performance of commercial banks in Kenya. *International Journal of Finance and Accounting* 10(2), 85-102.
- Dahmash, F. N., H. Al-Hazaima, and H. Alshurafat, 2023. Impact of earnings components on future profitability of banking and insurance companies in Jordan. *Banks and Bank Systems* 5(2), 34-50.

- Daudi, J. M., 2021. Performance-based rewards as a determinant of employee retention among tier-one commercial banks in Kenya. *Strathmore University Journal of Business* 2(2), 100-115.
- Domanovic, V., V. Todorović, and S. Savović, 2018. Internal factors of bank profitability in the republic of Serbia. *Journal of Business and Economic Horizons* 3(15), 659-673.
- Efing, M., H. Hau, P. Kampkötter, and J. Steinbrecher, 2015. Incentive pay and bank risk-taking: Evidence from Austrian, German, and Swiss banks. *Journal of International Financial Markets, Institutions and Money* 5(1), 34-48.
- Ekesiba, C. C., 2024. Employment casualization in Nigerian banks and its implication on human resource management practices. *BW Academic Journal* 9(2), 215-230
- Ekwe, M. C., 2013. The relationship between intellectual capitals and growth in revenue of deposit money banks in Nigeria. *Research Journal of Finance and Accounting* 4(2), 45-60.
- Eladly, S. M., 2021. Working capital management on profitability and earning assets of insurance industry in Egypt. *International Journal of Business and Management* 6(1), 34-45.
- Festus, B. G., A. T. Idera, and O. O. Taiwo, 2024. Human resource accounting and banks profitability: Evidence from deposit money banks listed on the Nigerian exchange. *Journal of Public Administration, Finance and Law* 31(2), 45-60.
- Fonseca, S., M. J. Guedes, and V. da Conceição Gonçalves, 2022. Profitability and size of newly established firms. *International Entrepreneurship and Management Journal* 18(2), 957-974.
- Garrow, V., 2004. Training and development and the psychological contract. *Training Journal* 5(1), 8-10.
- Gautam, K. R., 2020. Financial performance analysis of Nepalese financial institutions in the framework of CAMEL. *Janapriya Journal of Interdisciplinary Studies* 9(1), 56-74.
- Gidado, A. M., S. Kusairi, and S. Muhamad, 2014. Investing in human resource development: Empirical evidence from banking institutions of Malaysia and Nigeria. *Journal of Economic Development* 3(1), 24-40.
- Guruswamy, D., and A. Marew, 2017. Profitability performance of selected insurance companies in Ethiopia. *Journal on Management* 5(3), 56-70.
- Hamdan, M., M. B. Khaled, and S. B. Khaled, 2018. Employee benefits accounting, its impact on the market share price, the volume of credit facilities and deposits. *International Journal of Economics and Finance* 10(1), 56-70.
- Haris, M., H. X. Yao, G. Tariq, A., Malik and M. J. Iqbal, 2019. Intellectual capital performance and profitability of banks: Evidence from Pakistan. *Journal of Risk and Financial Management* 12(2), 45-60.
- Iloska, N., 2014. An analysis of bank profitability in Macedonia. *Journal of Applied Economics and Business* 2(1), 34-50.
- Inah, E. G., and A. D Agiabekong, 2024. Financial accounting information as an aid in management decision making of first bank Nigeria Plc. *Wukari International Studies Journal* 8(3), 112-124
- Kevser, M., 2021. Does bank size affect the bank profitability? An evidence from Borsa Istanbul (BIST), Turkey. *International Journal of Business and Economic Studie*, 2(2), 63-71.
- Khan, F. R., and I. S. Al Maktoumi, 2021. Performance evaluation of commercial banks in Oman using ratio analyses. *International Journal of Research in Entrepreneurship and Business Studies* 1(2), 10-21.
- Krasniqi, A., A. Ahmeti, and S. Ahmeti, 2021. The impact of cost control on the profitability of commercial banks. *EuroEconomica* 40(1), 106-118.
- Le, T. D., and D. T. Nguyen, 2020. Intellectual capital and bank profitability: New evidence from Vietnam. *Cogent Business and Management* 7(1), 1859666.
- Mariette, N., 2022. Factors influencing the performance of commercial banks of Kenya: Case of Equity Banks.

Journal of Banking and Finance Studies 5(2), 95-110.

- Mehzabin, S., A. Shahriar, and M. N Hoque, 2023. The effect of capital structure, operating efficiency and non-interest income on bank profitability: New evidence from Asia. *Asian Journal of Economics and Banking* 7(1), 24-38.
- Namutebi, G., 2018. The contribution of financial rewards towards employee productivity at Stanbic Bank Uganda Ltd: A case of Nakasero Branch. *Uganda Management Institute Journal* 6(1), 45-60.
- Nawangasari, A. T., M. I. Junjuran, Z. Fakhriroh, A. T. R. C. Yudha, and A. R. Fitrianto, 2022. Performance index and operating ratio: Effects Islamic on sharia profitability in Indonesia. *Jurnal Riset Akuntansi Kontemporer* 14(2), 175-188.
- Neupane, B. P., 2020. Profitability determinants of Nepalese commercial banks. *PressAcademia procedia* 12(1), 40-45.
- Niresh, J. A., and W. H. E. Silva, 2018. Nexus between corporate social responsibility disclosure and financial performance: Evidence from the listed banks, finance and insurance companies in Sri Lanka. *Accounting and Finance Research* 4(2), 45-60.
- Nuwagaba, G., and N. F. Tusubira, 2023. Financing alternatives for sustainable growth of micro, small and medium scale enterprises in Uganda: An ideal framework. *African Journal of Banking and Finance* 5(3), 120-145.
- Nzyoka, C. M. and B. H. Orwa, 2016. The relationship between total compensation and employee performance in the insurance industry, case of Mayfair Insurance Company Limited. *Psychology and Behavioral Sciences* 3(5), 28-37.
- Obieze, E. S., 2018. Impact of compensation management practice on employees' performance of selected banks in Delta State. *Journal of Financial Management* 4(2), 45-58.
- Ojeleye, Y., 2017. The impact of remuneration on employees' performance: A study of Abdul gusau polytechnic, Talata-Mafara and State College of Education Maru, Zamfara State. *Arabian Journal of Business and Management Review* 13(4), 128-137.
- Onuonga, S. M., 2014. The analysis of profitability of Kenya's top six commercial banks: Internal factor analysis. *American International Journal of Social Science* 4(3), 45-60.
- Pandey, D. L., 2017. Training-performance relationship: A study of Nepalese commercial banks. *The Saptagandaki Journal* 8, 31-41.
- Phan, H. T., T. N. Hoang, L. V. Dinh, and D. N. Hoang, 2020. The determinants of listed commercial banks' profitability in Vietnam. *The Journal of Asian Finance, Economics and Business* 7(11), 219-229.
- Sharma, A., 2012. Impact of human resource accounting on organizational performance. *IOSR Journal of Business and Management (IOSR-JBM)* 5(1), 25-31.
- Siddiqui, R., and T. Ali, 2023. Impact of training and development on the profitability of the banking sector: A study on the leading banks of Pakistan. *Journal of Finance, Accounting and Management* 14(1), 56-75.
- Sowunmi, S. O., I. O. Eleyowo, and M. A. Salako, 2015. Human resource development as a correlate of performance of the banking industry in Ogun State, Nigeria. *Journal of Economics and International Finance* 7(2), 45-58.
- Uddin, M. K., 2022. The effect of non-performing loan on state-owned commercial banks' profitability with operating efficiency as mediating variable. *European Journal of Business and Management Research* 7(3), 216-223.

Part VIII:

Economic Environment and Policy

Chapter 31

Impact of government expenditure on economic growth of Nepal

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Abstract

This study examines the impact of government expenditure on economic growth of Nepal. The selected dependent variables are gross domestic product and per capita income. Similarly, the selected independent variables are agriculture expenditure, education expenditure, health expenditure, communication expenditure, transportation expenditure, and electricity expenditure. The study is based on secondary data for the study period from 1989/1990 to year 2022/2023. The data were collected from the report published by Central Bureau of Statistics, the Ministry of Finance, World Bank, and Nepal Rasta Bank. The correlation analysis and regression models are estimated to test the significance and effect of government expenditure on economic growth of Nepal.

The study showed that agriculture has a positive impact on gross domestic product and per capita income. It indicates that increase in agriculture expenditure leads to increase economic growth of Nepal. In contrast, spending on education has a negative effect on both per capita income and the gross domestic product. It means that increase in education expenditure leads to decrease in economic growth of Nepal. Moreover, this study shows that government spending on health has a positive effect on both gross domestic product and per capita income. It means that increase in health spending leads to increase in gross domestic product and per capita income. Similarly, transportation expenditure has a positive effect on both gross domestic and per capita income. It means that increase in transportation expenditure leads to increase in economic growth of Nepal. Similarly, communication expenditure has a positive effect on the gross domestic product and per capita income. It means that increase in government expenditure leads to increase in economic growth of Nepal. Furthermore, electricity expenses has a positive but insignificant effect on gross domestic product and per capita income. It indicates that increase in electricity expenditure leads to no impact economic growth of Nepal.

Keywords: gross domestic product, per capita income, agriculture expenditure, education expenditure, health expenditure, communication expenditure, transportation expenditure, electricity expenditure

1. Introduction

Government expenditure refers to the total amount of money that a government uses to provide public services, fund social programs, and carry out its functions. Economic development in any country essentially depends on a series of activities that are taking place or continuing to create better condition both simultaneously and consistently. Within this framework, it can also spur the economic development for equitable development in order to improve the welfare of the people fairly and equitably. Government expenditure play a major role in fiscal policy. Economic growth is defined as the steady process by which the productive capacity of the economy is increased over time to bring about rising levels of national output and income while economic development is defined as the process of improving the quality of all human life (Smith, 2003). According to the neo-classical economists, reducing the role of private sector by crowding-out effect is important because it reduces the inflation in the economy; increase in public debt, increases the interest rate which reduces inflation in the economy as well as output (Sen and Kaya, 2014). Ranjan and Sharma (2008) concluded that expansion of government expenditure contributes positively to economic growth. The rise in the amount of products and services generated by an economy over time is known as economic growth. An economy's ability to raise its productive capacity makes it more equipped to produce more units of products and services (Chughtai *et al.*, 2015). The term economic growth describes the growth of a certain metric, such as per capita income, real national income, or gross domestic product. The gross domestic product is the total

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value-added output of the domestic economy and is often used to express national income or product. Spencer *et al.* (1993) defined economic growth as the rate of increase in an economy's full employment real output or income overtime.

Government expenditure represents the engine of economic growth by contributing to the increase in the productive capacity of the local economy, especially if it is directed correctly toward important economic sectors. If government spending is zero, presumably there will be very little economic growth because enforcing contracts, protecting property, and developing an infrastructure would be very difficult. In other words, some government expenditure is necessary for the successful operation of the rule of law. Government expenditure remains an important instrument utilized in the process of development. Expenditure plays a pivotal role in the functioning of any economy at almost all stages of growth and development. Most developing and developed countries today use public expenditure to improve income distribution, direct the allocation of resources in desired areas, and influence the composition of national income (Vtyurina, 2020). The relationship between government expenditure and economic growth has continued to generate a series of controversies. Akpan (2005) concluded that the effect of government expenditure on economic growth is negative and insignificant. The relationship between government expenditure and economic growth has continued to generate a series of controversies. While some studies concluded that the effect of government expenditure on economic growth is negative and insignificant (Akpan, 2005). Others indicated that the effect is positive and significant (Jiranyakul and Brahmasrene, 2007). Similarly, Yasin (2000) re-examined the effect of government spending on economic growth in 26 sub-Saharan African (SSA) countries from 1987 to 1997. The results of the study showed that government expenditure has a positive effect on economic growth in SSA. However, Landau (1983) examined the effect of government (consumption) expenditure on economic growth for a sample of 96 countries. The study found a negative effect of government expenditure on growth of real output.

Abur *et al.* (2014) examined the impact of public expenditure on education expenditure and economic growth in Nigeria. The study showed that public expenditure has a positive impact on economic growth in Nigeria. Piabuo and Tieguhong (2017) examined the impact of health expenditure between countries in the CEMAC sub-region and five other African countries that achieved the Abuja declaration. The study showed that health expenditure has a positive and significant effect on economic growth in both samples. Matovu and Sennoga (2013) revealed that government spending on communication contribute to higher economic growth and accelerate the rate of poverty reduction. Landau (1983) found that in line with the pro-market theory that holds that government expansion restrains overall economic growth, the gross domestic product proportion of government consumption decreased economic growth. The findings were relevant to per capita output growth and did not always result in higher economic welfare. Ram (1986) found that government expenditure has a large positive externality impact on growth, especially in emerging nations. Gemmell *et al.* (2014) examined the historical correlation between gross domestic product and variations in overall government expenditure for a sample of OECD nations from 1970 to 2011. The study showed a long-term positive correlation between public spending and Nigeria's economic growth as well as higher education. Chinweoke *et al.* (2014) explained the relationship between government expenditures and Nigeria's economic expansion from 1992 to 2011. The study showed that, although not significantly, federal expenditure has a positive impact on Nigeria's economic growth.

Muturi and Omari (2016) examined the impact of sectorial government spending on Kenya's poverty rate. The findings showed that government spending on health care significantly and favorably affects per capita income. The study showed that per capita is not significantly affected by government spending on the education sector. Al-Mazrouei and Nejme (2012) looked at the effect of governmental

spending from 1990 to 2009 on the gross domestic product of the United Arab Emirates. The findings of the regression analysis demonstrated that public spending had a favorable effect on the UAE's GDP. Elijah *et al.* (2018) examined the impact of government expenditure on transportation sector and economic growth in Nigeria. The study showed that continuous increase in government expenditure on transportation will increase the gross domestic product.

Liu *et al.* (2008) investigated the causal link between gross domestic product and public spending. The findings of the causality analysis showed that gross domestic product growth is caused by total government spending. However, an increase in gross domestic product does not automatically translate into an increase in government spending. Furthermore, the estimation results showed that public spending increases the growth of the US economy. Elola *et al.* (1995) stated that the health of the population is influenced by both the type of health system and of their resources. The study found that there is a significant positive relationship between government expenditure on health and PCI. Olulu *et al.* (2014) examined the empirical relationship between government expenditure and economic growth. The study found that there is a negative relationship between government expenditure on health and economic growth. In contrast, government expenditure on the education sector was shown to be insufficient to cater to Nigeria's expanding industry. Nurudeen and Usman (2010) found that government expenditure on education has positive effects on economic growth. Barro (1999) assessed the determinants of economic growth for a panel of 100 countries using data from 1960 to 1995. The study showed that government investment expenditure has a positive impact on economic growth and concluded that investment spending by a government should be encouraged in order to boost economic growth. Similarly, Ram (1986) studied the linkage between government expenditure and economic growth for a group of 115 countries. The study found a positive influence of government expenditure on economic growth. Moreover, Al-Yousif (2000) revealed that government spending has a positive relationship with economic growth in Saudi Arabia.

In a context of Nepal, Khanal (1988) analyzed the growth, pattern, and impact of government expenditure on Nepalese economic growth. The study found that gross domestic product only increased by 2.04 percent when government expenditure increase by 8.42 percent per annual. The study also found that government expenditure increased only after 1970. Government expenditure has been increasing tremendously mainly after the restoration of democracy in 1991 and adoption of liberalization policy in 1992. Ghimire (2021) examined the relationship between economic growth and public expenditure in the transportation sector in Nepal. The study showed that there is a positive and significant influence of transportation capital expenditure on gross domestic product. Sharma (1999) found that economic growth rate is less as compared to regular during the past three decades because of high investment in unproductive sector and decreasing in development expenditure. Increasing challenges encountered in relation to the rising expectations of people have prompted the government to become serious as to the means and the use of the scarce resources in a more organized and effective manner.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of government expenditure on the economic growth are of greater significance. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of government expenditure on economic growth of Nepal. Specifically, it examines the relationship of agriculture expenditure, education expenditure, health expenditure, transportation expenditure, communication expenditure and electricity expenditure on gross domestic product and per capita income of Nepal.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 1989/90 and 2022/23. The main sources of data include reports published by The World Bank, the Ministry of Finance, Nepal Rasta Bank, and the Central Bureau of Statistics. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of government expenditure and economic growth for the study along with the study period.

Table 1

List of government expenditure and economic growth for the study along with study period

S.N.	Name of the variables	Study period
1	Gross domestic product	1989/90-2022/23
2	Per capita income	1989/90-2022/23
3	Agriculture expenditure	1989/90-2022/23
4	Education expenditure	1989/90-2022/23
5	Communication expenditure	1989/90-2022/23
6	Transportation expenditure	1989/90-2022/23
7	Health expenditure	1989/90-2022/23
8	Electricity expenditure	1989/90-2022/23

Thus, the study is based on time series data.

The model

The model used in this study assumes that economic growth depends upon agriculture expenditure, education expenditure, health expenditure, transportation expenditure, communication expenditure and electricity expenditure. Therefore, the models take the following forms

$$GDP_{it} = \beta_0 + \beta_1 AE_{it} + \beta_2 EdE_{it} + \beta_3 EE_{it} + \beta_4 HE_{it} + \beta_5 TE_{it} + \beta_6 CE + e_{it}$$

$$PCI_{it} = \beta_0 + \beta_1 AE_{it} + \beta_2 EdE_{it} + \beta_3 EE_{it} + \beta_4 HE_{it} + \beta_5 TE_{it} + \beta_6 CE + e_{it}$$

Where,

GDP = Gross domestic product as measured by real gross domestic product, Rs. in billion.

PCI = Per capita income as measured by average income earned per person, in Rs.

AE= Agricultural Expenditure, Rs. in million.

EdE= Education Expenditure, Rs. in million.

EE= Electricity Expenses, Rs. in million.

HE= Health Expenditure, Rs. in million.

TE= Transportation Expenditure, Rs. in million.

CE=Communication Expenditure, Rs. in million.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Education expenditure

Investments in education enhance human capital, which is a critical driver of productivity and innovation. Increased spending on education improves access to quality schooling, enhances skill development, and fosters a more competent and adaptive workforce, enabling individuals to contribute effectively to the economy. Education spending also reduces inequality, promotes social mobility, and supports technological advancements, which further boost economic performance. Krueger and Lindahl (2001) found that overall education is statistically significantly and positively associated with subsequent growth only for the countries with the lowest education. Education has long been viewed as an important determinant of economic well-being. Akamobi *et al.* (2016) found that the effect of government sectorial spending on economic growth in Nigeria. The study found that government expenditure on education has a positive impact on economic growth. Similarly, Dada (2013) examined the composition effect of government expenditure on private consumption and output growth in Nigeria. Nurudeen and Usman (2010) found that government expenditure on education is negatively related to gross domestic product. Based on it, the study develops following hypothesis:

H₁: There is a positive relationship between government expenditure on education and the economic growth.

Agriculture expenditure

Agriculture is a major contributor of Nigeria's gross domestic product and small- scale farmers play a dominant role. Dada (2013) examined the composition effect of government expenditure on private consumption and output growth in Nigeria. The study found that government expenditure on agriculture has a positive effect on growth output. There is a positive relationship between government expenditure on agriculture and economic growth, as investments in agriculture play a crucial role in enhancing productivity, ensuring food security, and supporting livelihoods, particularly in agrarian economies. Increased spending on agricultural infrastructure, research, irrigation systems, subsidies, and market access helps boost crop yields, reduce post-harvest losses, and promote the adoption of modern farming techniques. This leads to increased agricultural output, which stimulates rural incomes, generates employment, and contributes to overall GDP growth (Akamobi *et al.*, 2016). Olajide *et al.* (2012) analyzed the relationship between agricultural resource and economic growth in Nigeria between 1970 and 2010. The study found a positive causal relationship between GDP and agricultural output in Nigeria. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between government expenditure on agriculture and the economic growth.

Health expenditure

Dauda (2001) analyzed the relationship between health expenditure and economic growth for Nigeria spanning from 1970-2009. The study found that health expenditure is positive and statistically significant but the coefficients of the second and third lags are negative and statistically significant. Expenditure on healthcare improve public health, enhance productivity, and foster a more stable and resilient workforce. Increased government spending on health services, such as hospitals, disease prevention programs, and healthcare infrastructure, leads to better overall health outcomes, reducing mortality rates and improving life expectancy. Bhargava *et al.* (2001) found positive relationship between adult survival rate and economic growth. A healthier population is more productive, experiences fewer

workdays lost to illness, and contributes more effectively to the economy. Furthermore, investing in health can promote social stability and reduce inequality, as it ensures that all segments of society have access to essential medical services. Bloom *et al.* (2001) found that there is positive and significant effect of health on economic growth. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship of government expenditure on health with the economic growth.

Transportation expenditure

Yahaya (2019) found a significant relationship of government expenditure on transportation with poverty trend in Nigeria. As investments in transportation infrastructure improve connectivity, reduce transaction costs, and facilitate the efficient movement of goods and people. Enhanced transportation networks, such as roads, railways, ports, and airports, are essential for facilitating trade, supporting industries, and attracting investment. Improved infrastructure not only boosts domestic productivity by enabling quicker and more reliable supply chains but also opens up new markets, both domestically and internationally. Additionally, government spending on transportation creates jobs, stimulates construction and manufacturing sectors, and improves access to remote areas, which can lead to regional economic development. Chandra and Thompson (2000) found that investments in Interstate highways raised economic growth in counties in which the highways passed directly. Sahoo *et al.* (2010) found that infrastructure investment in China has a significant positive impact on economic growth. Mohmand (2017) found that the direct and indirect effects of transportation infrastructure have a positive impact on the economic growth and development of a country. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship of government expenditure on transportation with the economic growth.

Communication expenditure

Charles-Anyagou and Ebiringa (2012) found that there is a positive and significant impact of government expenditure on communication on economic growth. Moreover, Haque and Kim (2003) investigated the relationship of the public investment in transportation and communication with economic growth. The study found that there is a positive impact of public investment on communication on economic growth. Yahaya (2019) found negative and significant relationship of government expenditure on communication with poverty trend in Nigeria. Nurudeen and Usman (2010) found a significant positive association between expenditure on communication and gross domestic product. Ebiringa *et al.* (2012) investigated the impact of government sectoral expenditure on the economic growth of Nigeria. The study found that government expenditures remain the bedrock of Nigeria's economic growth. There is a positive relationship between government expenditure on communication and economic growth, as investments in communication infrastructure enhance connectivity, productivity, and economic efficiency. Improved communication networks, such as broadband internet, mobile services, and digital platforms, facilitate the flow of information, reduce transaction costs, and enable businesses to operate more efficiently. This, in turn, drives innovation, boosts trade, and supports the growth of industries like e-commerce, financial technology, and digital services. Moreover, enhanced communication systems improve governance, education, and healthcare delivery by bridging urban-rural divides and promoting social inclusion. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship of government expenditure on communication with the economic growth.

Electricity expenditure

The relationship between government expenditure on electricity and economic growth is often positive, particularly in developing economies, where infrastructure investment plays a key role in driving productivity and economic activity (Wolde-Rufael, 2005). Villarroya *et al.* (2020) found electricity production boosted economic growth in Spain. Azam *et al.* (2020) found unidirectional causality exists between electricity and growth. There is a positive relationship between government expenditure on electricity and economic growth, as investments in electricity infrastructure are fundamental for enhancing productivity and fostering economic activity. A reliable and accessible energy supply supports industrial growth, agricultural mechanization, and service sector expansion, enabling businesses to operate efficiently and reducing production costs. Moreover, government spending on electricity, particularly in generation, transmission, and distribution, helps address energy deficits, promotes rural electrification, and reduces reliance on expensive energy imports. This not only stimulates immediate economic activity through job creation but also drives long-term growth by improving access to energy for households, schools, and healthcare facilities, thus enhancing human capital development. Bacon and Kojima (2016) found that there is a positive effect of energy use on economic growth. Government expenditure on electricity tends to have a positive relationship with economic growth, particularly in economies with energy deficits. However, the effectiveness of such spending hinges on the quality of project management, policy frameworks, and the broader economic environment. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship of government expenditure on electricity with economic growth.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 1989/90 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables for the study period of 1989/90 to 2022/23. The dependent variables are GDP (Gross domestic product, Rs. in Million) and PCI (Per capita income as measured by average income earned per person, in Rupees). The independent variables are AE (Agricultural expenditure, Rs. in million), EdE (Educational expenditure, Rs. in million), HE (Health expenditure, Rs. in million), TE (Transportation expenditure, Rs. in million), EE (Electricity expenditure, Rs. in million) and CE (Communication expenditure, Rs. in million).

Variables	Minimum	Maximum	Mean	Std. Deviation
GDP	103416	5348527	1497453.68	1561396.17
PCI	5271.88	173110.61	53094.58	51643.47
AE	2402	38319	11215.32	10047.063
EdE	96	5098	1605.35	1368.093
HE	142	15747	3307.29	3725.088
TE	207	105590	18699.91	28262.517
CE	56	1875	659.18	515.704
EE	224	20659	5322.88	4421.143

Source: SPSS Software

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent for the study period of 1989/90 to 2022/23. The dependent variables are GDP (Gross domestic product as measured, Rs. in million) and PCI (Per capita income as measured by average income earned per person, in Rupees). The independent variables are AE (Agricultural expenditure, Rs. in million), EdE (Educational expenditure, Rs. in million), HE (Health expenditure, Rs. in million), EE (Electricity expenditure, Rs. in million), TE (Transportation expenditure, Rs. in million) and CE (Communication expenditure, Rs. in million).

Variables	GDP	PCI	AE	EdE	HE	TE	CE	EE
GDP	1							
PCI	0.909**	1						
AE	0.859**	0.867**	1					
EdE	-0.350*	-0.377*	-0.315	1				
HE	0.922**	0.907**	0.786**	-0.100	1			
TE	0.525**	0.555**	0.635**	-0.503**	0.301	1		
CE	0.501**	0.482**	0.375*	-0.072	0.530**	0.071	1	
EE	0.223	0.236	0.255	-0.161	0.195	0.502**	-0.024	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that there is a positive relationship between agriculture expenditure and gross domestic product. It indicate that increase in agriculture expenditure leads to increase in gross domestic product. Similarly, education expenditure has a negative relationship with gross domestic product. It means that increase in education expenditure leads to decrease in gross domestic product. In addition, there is positive relationship between health expenditure and gross domestic product. It means that increase in health expenditure leads to increase in gross domestic product. Moreover, there is a positive relationship between transportation expenditure and gross domestic product. In means that increase in transportation expenditure leads to increase in gross domestic product. Similarly, there is positive relationship between communication expenditure and gross domestic product. It means that increase in communication expenditure leads to increase in gross domestic product. Furthermore, there is a positive relationship between electricity expenditure and gross domestic product. It indicates that increase in electricity expenditure leads to increase in gross domestic product.

On the other hand, the result shows that there is a positive relationship between agriculture expenditure and per capita income. It indicate that increase in agriculture expenditure leads to increase in per capita income. Similarly, education expenditure has a negative relationship with per capita income. It means that increase in education expenditure leads to decrease in per capita income. In addition, there is positive relationship between health expenditure and per capita income. It means that increase in health expenditure leads to increase in per capita income. Moreover, there is a positive relationship between transportation expenditure and per capita income. In means that increase in transportation expenditure leads to increase in per capita income. Similarly, there is positive relationship between communication expenditure and per capita income. It means that increase in communication expenditure leads to increase in per capita income. Furthermore, there is a positive relationship between electricity expenditure and per capita income. It indicates that increase in electricity expenditure leads

to increase in per capita income.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and the results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of government agricultural expenditure, education expenditure, health expenditure, transportation expenditure and communication expenditure on gross domestic product of Nepal.

Table 4

Estimated regression results of government agricultural expenditure, education expenditure, health expenditure, transportation expenditure, electricity expenditure, and communication expenditure on gross domestic product of Nepal

The results are based on time series data for the study period from 1989/90 to 2022/23. by using the linear regression model and the model is $GDP_t = \beta_0 + \beta_1 AE_t + \beta_2 EdE_t + \beta_3 EE_t + \beta_4 HE_t + \beta_5 TE_t + \beta_6 CE_t + e_t$, where the dependent variable is GDP (Gross domestic product, Rs. in million). The independent variables are AE (Agricultural expenditure, Rs. in million), EdE (Educational expenditure, Rs. in million), EE (Electricity expenditure, Rs. in million), HE (Health expenditure, Rs. in million), TE (Transportation expenditure, Rs. in million) and CE (Communication expenditure, Rs. in million).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		AG	EdE	HE	TE	CE	EE			
1	2.540 (1.987)* 17.826 (21.505)**	1.231 (8.695)**						0.693	0.659	75.603
2			-0.622 (5.179)**					0.439	0.891	26.820
3				0.816 (7.950)**				0.653	0.700	63.208
4					0.331 (2.480)*			0.135	1.106	6.159
5						0.634 (2.80)**		0.172	1.083	7.842
6							0.634 (2.80)**	0.013	1.197	0.580
7		0.987 (6.220)**	-0.265 (2.663)**					0.742	0.604	48.543
8		0.408 (1.428)	-0.298 (3.179)**	0.424 (2.336)*				0.776	0.563	39.085
9		0.406 (1.394)	-0.296 (2.875)**	0.424 (2.336)*	0.004 (0.055)			0.768	0.573	28.340
10		0.333 (0.261)	-0.294 (2.908)**	0.409 (2.293)*	0.026 (0.328)	0.193 (1.470)		0.777	0.562	24.001
11		0.436 (1.436)	-0.315 (3.073)**	0.341 (1.820)	0.001 (0.012)	0.155 (1.147)	0.123 (1.104)	0.779	0.559	20.368

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Gross domestic product is the dependent variable.

Table 4 shows that the beta coefficients for agriculture expenditures are positive with the gross domestic product. It indicates that agriculture expenditure has a positive impact on gross domestic product. This finding is similar to the finding of Dada et al. (2013). Similarly, the beta coefficients for education expenditures are negative with gross domestic product. It indicates that education expenditure has a negative impact on gross domestic product. This finding is consistent with the finding of Nurudeen and Usman (2010). Likewise, the beta coefficients for health expenditures are positive with gross domestic product. It indicates that health expenditure has a positive impact on gross domestic product. This finding is similar to the finding of Bloom *et al.* (2001). Similarly, the beta coefficients of transportation expenditures are positive correlations with the gross domestic product.

It indicates that transportation expenditure has a positive impact on the gross domestic product. This finding is consistent with the finding of Easterly and Rebelo (1993). Likewise, the beta coefficients for communication expenditures are positive with gross domestic product. It indicates that the communication expenditure has a positive impact on gross domestic product. This finding is similar to the finding of Charles-Anyagou and Ebiringa (2012). Furthermore, the beta coefficients for electricity expenditures are positive but insignificant with gross domestic product. It indicates that electricity expenditure has a positive but very weak impact on gross domestic product. This finding is similar to the finding of Bacon and Kojima (2016).

Table 5 shows the regression results of agriculture expenditure, education expenditure, health expenditure, transportation expenditure, electricity expenditure and communication expenditure on per capita income of Nepal.

Table 5

Estimated regression results of government agricultural expenditure, education expenditure, health expenditure, transportation expenditure, electricity expenditure, and communication expenditure on per capita income of Nepal

The results are based on time series data for the study period from 1989/90 to 2022/23, by using the linear regression model and the model is $PCI_{it} = \beta_0 + \beta_1 AE_{it} + \beta_2 EdE_{it} + \beta_3 EE_{it} + \beta_4 HE_{it} + \beta_5 TE_{it} + \beta_6 CE_{it} + e_{it}$, where the dependent variable is PCI (Per capita income, in Rs.). The independent variables are AE (Agricultural expenditure, Rs. in million), EdE (Educational expenditure, Rs. in million), EE (Electricity expenditure, Rs. in million), HE (Health expenditure, Rs. in million), TE (Transportation expenditure, Rs. in million) and CE (Communication expenditure, Rs. in million).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		AG	EdE	HE	TE	CE	EE			
1	0.214 (1.920)	1.129 (9.132)**						0.714	0.575	83.386
2	14.243 (19.289)**		-0.572 (5.384)**					0.455	0.794	28.597
3	4.788 (6.859)**			0.741 (8.082)**				0.661	0.626	65.321
4	7.664 (7.084)**				0.304 (2.525)*			0.140	0.997	6.378
5	6.860 (5.356)**					0.566 (2.759)**		0.167	0.982	7.610
6	9.284 (5.881)**						0.131 (0.688)	0.016	1.084	0.473
7	3.912 (2.391)*	0.903 (6.611)**	-0.246 (2.869)**					0.767	0.519	55.235
8	5.824 (3.357)**	0.411 (1.670)	-0.274 (3.384)**	0.359 (2.335)*				0.796	0.486	43.926
9	5.795 (3.062)**	0.410 (1.633)	-0.274 (3.384)**	0.359 (2.296)*	0.003 (0.044)			0.789	0.494	31.849
10	5.274 (2.778)**	0.350 (1.393)	-0.271 (3.093)**	0.347 (2.249)*	0.021 (0.304)	0.159 (1.403)		0.796	0.486	26.725
11	4.586 (2.295)*	0.437 (1.659)	-0.288 (3.247)**	0.290 (1.785)	0.002 (0.026)	0.128 (1.089)	0.104 (1.074)	0.797	0.485	22.584

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Per capita income is the dependent variable.

Table 5 shows that the beta coefficients for agriculture expenditures are positive with per capita income. It indicates that agriculture expenditure has a positive impact on per capita income. This finding is similar with the finding of Udoh (2011). Likewise, the beta coefficients for education expenditures are negative with per capita income. It indicates that education expenditure has a negative

impact on per capita income. This finding is consistent with the finding of Nurudeen and Usman (2010). Furthermore, the beta coefficients for health expenditures are positive with per capita income. It indicates that health expenditure has a positive impact on per capita income. This finding is similar with the finding of Sainasinh et al. (2014). Similarly, the beta coefficients of transportation expenditures are positive correlations with the per capita income. It indicates that transportation expenditure has a positive impact on the per capita income. This finding is consistent with the finding of Fan et al. (2004). Likewise, the beta coefficients for communication expenditures are positive with per capita income. It indicates that the communication expenditure has a positive impact on per capita income. This finding is similar with the finding of Belgrave and Craigwell (1995). Furthermore, the beta coefficients for electricity expenditures are positive with per capita income. It indicates that electricity expenditure has a impact on gross domestic product. This finding is consistent with the finding of Hayat et al. (2012).

4. Summary and conclusion

The government allots funds for national development initiatives each year. In essence, it divides spending into capital and ongoing categories. Capital spending is essential to the development of industry, manufacturing, agriculture, health, transportation, education, and hydropower, all of which have a significant impact on the nation's economy in the long run. These measurement help to minimize the risk of unnecessary budget allotment. This study also help to find out the most significant and important sector for investment for economic growth of Nepal. Per capita income and gross domestic product are the dependent variables. Transportation, health, education, communication, electricity, and agriculture are the independent variables.

This study attempts to examine the impact of agriculture expenditure, education expenditure, health expenditure, communication expenditure, transportation expenditure and electricity expenditure on economic growth of Nepal. The study is based on secondary data of Nepal capital expenditure for the period from 1989/90 to 2022/23.

The major conclusion of this study is that there is varied relationships between different categories of public expenditure and economic indicators such as gross domestic product (GDP) and per capita income, offering important insights into the economic impact of sectoral spending. The study showed a positive relationship between agriculture expenditure and both GDP and per capita income, suggesting that increased investment in agriculture significantly boosts overall economic output and individual income levels, likely due to the sector's foundational role in providing food security, employment, and raw materials for industries. Similarly, health expenditure shows a positive correlation with GDP and per capita income, emphasizing the critical role of healthcare in enhancing human capital and productivity. Expenditure on transportation, communication, and electricity also demonstrates a positive impact on both GDP and per capita income, reflecting the importance of infrastructure and utility services in facilitating economic activities, improving connectivity, and enhancing quality of life. Conversely, the study reveals a negative relationship between education expenditure and both GDP and per capita income, indicating that increased spending in this sector might not translate into immediate economic returns, potentially due to long gestation periods associated with investments in education. This finding could also point to inefficiencies in the allocation or utilization of education budgets or a mismatch between educational outcomes and labor market demands. The study also concluded that there is a significant and multifaceted contributions of agriculture, health, transportation, communication, and electricity expenditures to economic growth and individual well-being. These findings suggest that prioritizing investments in these sectors can yield substantial economic dividends. However, the negative correlation between education expenditure and economic indicators calls for a closer examination of education policies, resource allocation, and their alignment

with broader economic objectives to ensure long-term sustainable development.

References

- Abur, C. C., M. A. Chiawa, and J. T. Torruam, 2014. Cointegration analysis of public expenditure on tertiary education and economic growth in Nigeria. *CBN Journal of Applied Statistics* 5(2), 137-146.
- Akamobi, A. A., C. S. Ekesiobi, B.N. Ibekilo, and C. O. Obi, 2016. Investigating government sectorial spending and economic growth: Empirical evidence from Nigeria. *Research on Humanities and Social Sciences* 6(12), 111-117.
- Akpan, N. I., 2005. Government expenditure and economic growth in Nigeria: A disaggregated approach. *Economic and Financial Review* 43(1), 51-69.
- Al-Mazrouei, A. I., and E. Nejme, 2012. The impact of public expenditure in gross domestic product: An empirical study on the United Arab Emirates through the period (1990-2009). *Damascus University Journal for Economic and Legal Science* 28(1), 611-650.
- Al-Yousif, Y. K., 2000. Do government expenditures inhibit or promote economic growth: Some empirical evidence from Saudi Arabia. *Indian Economic Journal* 48(2), 92-110.
- Azam, A., M. Rafiq, M. Shafique, M. Ateeq, and M. Yuan., 2020. Causality relationship between electricity supply and economic growth: Evidence from Pakistan. *Energies* 13(4), 837-849.
- Bacon, R., M. Kojima, 2016. Energy, economic growth, and poverty reduction: A literature review. *World Bank Working Paper No. 104866*.
- Barro, R. J., 1999. Determinants of democracy. *Journal of Political Economy* 107(6), 158-183.
- Belgrave, A., and R. Craigwell, 1995. The impact of government expenditure on economic growth in Barbados: A disaggregated approach. *DeLisle Worrell and Roland Craigwell* 2(6), 138-149.
- Bhargava, A. D. T., L.J. Jamison and C. J. L. Murray, 2001. Modelling the effects of health on economic growth. *Journal of Health Economics* 20(1), 423-440.
- Bloom, E., D. Canning, and J. Sevilla, 2001. The effect of health on economic growth: Theory and Evidence. *NBER Working Paper No. 8587*.
- Charles-Anyaogu, N. B. and O. T. Ebiringa, 2012. Impact of government sectorial expenditure on the economic growth of Nigeria. *International Journal of Economic Research* 3(6), 82-92.
- Chinweoke, N., N. Ray, and N. Paschal, 2014. Impact of government expenditure on Nigeria's Economic Growth (1992-2011). *The Macrotheme Review: A Multidisciplinary Journal of Global Macro Trends* 3(7), 79-87.
- Chughtai, M. S., M.W. Malik, and A. Rashid, 2015. Impact of major economic variables on economic growth of Pakistan. *Acta University Statistics Danibus* 11(2), 94-106.
- Dada, M. A., 2013. Composition effects of government expenditure on private consumption and output growth in Nigeria: A single-equation error correction modelling. *Romanian Journal of Fiscal Policy* 4(2), 18-34.
- Dauda, R.O., 2001. Investment in education and economic growth in Nigeria: An Empirical Evidence. *International Research Journal of Finance and Economics* 55(1), 158-169.
- Easterly, W., and S. Rebelo, 1993. Fiscal policy and economic growth. *Journal of Monetary Economics* 32(3), 417-458.
- Ebiringa, O. F., and N. B. Chalse-Anyaogu, 2012. Impact of government sectorial expenditure on the economic. *International Journal of Business and Management Review* 1(4), 64-71.
- Elijah, S., M. Usaini, and M. Yusufu, 2018. Impact of government expenditure on transportation sector and

- economic growth in Nigeria (1980-2016). *Bingham Journal of Economics and Allied Studies* 1(2), 1-12.
- Elola, J., A. Daponte, and V. Navarro, 1995. Health indicators and the organization of health care systems in Western Europe. *American Journal of Public Health* 85(10), 1397-1401.
- Fan, S., L. Zhang, and X. Zhang, 2004. Reforms, investment, and poverty in rural China. *Economic Development and Cultural Change* 52(2), 395-421.
- Gemmell, N., R. Kneller, and I. Sanz, 2014. Does the Composition of Government Expenditure Matter for Long-run GDP Levels. Working Paper, Chair in Public Finance, Victoria University of Wellington, New Zealand.
- Ghimire, N. P., 2021. Public expenditure in Nepal: A case of transportation sector. *Journal of Management and Development Studies* 30(1), 24-36.
- Haque, M. E., and D. H. Kim, 2003. Public investment in transportation and communication and growth: A dynamic panel approach. *Centre for Growth and Business Cycle Research* 1(31), 1-24.
- Hayat, S., H. Khan, I. Jan, 2012. Determinants of rural household energy choice: An example from Pakistan. *Polish Journal of Environmental Studies* 21(3), 2012.
- Jiranyakul, K., and T. Brahmasrene, 2007. The relationship between government expenditures and economic growth in Thailand. *Journal of Economic Education* 14(1), 234-246.
- Khanal, D. R., 1988. *Public Expenditure in Nepal: Growth Pattern and Impact* (Streling Publishers Pvt. Ltd, New Delhi).
- Krueger, A., and M. Lindahl, 2001. Education for Growth: Why and for Whom? *Journal of Economic Literature* 39, 1101-1136.
- Landau, D., 1983. Government expenditure and economic growth: A cross-country study. *Southern Economic Journal* 49(3), 783-792.
- Liu, C., C. Hsu, and M. Z. Younis, 2008. The association between government expenditure and economic growth: The Granger Causality Test of the US Data, 1974-2002. *Journal of Public Budgeting, Accounting and Financial Management* 20(4): 439-52.
- Matovu, J. M., and E. B. Sennoga, 2013. Public spending composition in Uganda and its implications for growth and poverty reduction. *Public Finance Review* 41(2), 227-247.
- Mohmand, Y. T., A. Wang, and A. Saeed, 2017. The impact of transportation infrastructure on economic growth: empirical evidence from Pakistan. *Transportation Letters* 9(2), 63-69
- Muturi, W., and L.B. Omari, 2016. The effect of government sectorial expenditure on poverty level in Kenya. *Journal of Economics and Sustainable Development* 7(8), 219-242.
- Nurudeen, A., and A. Usman, 2010. Government expenditure and economic growth in Nigeria, 1970-2008: A disaggregated analysis. *Business and Economics Journal* 10(4), 1-11.
- Olajide, O., B. Akinlabi, and A. Tijani, 2012. Agricultural resource and economic growth in Nigeria. *European Scientific Journal* 8 (22), 103-115.
- Olulu, R. M., E.K. Erhieyovwe, and U. Andrew, 2014. Government expenditures and economic growth: The Nigerian experience. *Mediterranean Journal of Social Sciences* 5(10), 89-89.
- Piabuo, S. M., and J.C. Tieguhong, 2017. Health expenditure and economic growth-a review of the literature and an analysis between the economic community for central African states (CEMAC) and selected African countries. *Health Economics Review* 7(1), 1-13.
- Ram, R., 1986. Government size and economic growth: A new framework and some evidence from cross-section

- and time-series data. *The American Economic Review* 76(1), 191-203.
- Ranjan K. D., and C. Sharma, 2008. Government expenditure and economic growth: Evidence from India. *The ICAFI University Journal of Public Finance* 6(3), 60-69.
- Sahoo, P., R. K. Dash, and G. Nataraj, 2010. Infrastructure investment and economic growth in China. Discussion Paper 261. *Institute of Developing Economies, Japan External Trade Organization, Chiba*.
- Sainasinh, S., K. Souriya, and P. Onphandala, 2014. Public spending, aid effectiveness and poverty reduction in Lao PDR. *Journal of International Cooperation Studies* 21(3), 163-186.
- Sen, H., and A. Kaya, 2014. Crowding-out or crowding-in? Analyzing the effects of government spending on private investment in Turkey. *Panoeconomicus* 61(6), 631-651.
- Sharma, B. P., 1999. The problems and prospects of regular and developmental budget of HMG/Nepal. *The Economic Journal of Nepal* 22(1), 1-17.
- Smith, N. C., 2003. Corporate social responsibility: whether or how? *California Management Review* 45(4), 52-76.
- Spencer, M. A., and M.A. Orley, 1993. *Contemporary Macroeconomics* (Worth Publishers, New York).
- Udoh, E., 2011. An examination of public expenditure, private investment and agricultural sector growth in Nigeria: Bounds testing approach. *International Journal of Business and Social Science* 2(13), 285-292.
- Villarroya, J. J. S., I. Sanz-Villarroya, and L.P. Perez, 2020. Economic growth or electricity, what came first in Spain after 1958? *Applied Economic Analysis* 29(86), 105-123.
- Vtyurina, S., 2020. Effectiveness and equity in social spending: the case of Spain. *IMF Working Paper, No. WP/20/16*.
- Wolde-Rufael, Y., 2005. Energy demand and economic growth: The African experience. *Journal of Policy Modeling* 27(8), 891-903.
- Yahaya, N., 2019. Relationship between government expenditure and poverty trends: A study of Nigeria. *Journal of Economics and Finance* 10(6), 39-52.
- Yasin, M. 2000. Public spending and economic growth: Empirical investigation of Sub-Saharan Africa. *Southwestern Economic Review* 30(1), 59-68.

Chapter 32

Determinants of financial distress: A case of Nepalese commercial banks

- Anil Phuldel*

Abstract

This study examines the determinants of financial distress of Nepalese commercial banks. Z-score and non-performing loans are the selected dependent variables. The selected independent variables are leverage, return on equity, capital adequacy ratio, gross domestic product growth rate, interest rate, and inflation rate. The study is based on secondary data of 12 commercial banks with 108 observations for the study period from 2014/15 to 2022/23. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, reports published by the Ministry of Finance and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of different factors on the financial distress of Nepalese commercial banks.

The study showed that leverage ratio has a negative effect on Z- score and non-performing loan. It indicates that increase in leverage ratio leads to decrease in Z- score and non-performing loan. Similarly, return on equity has a positive effect on Z- score and non-performing loan. It indicates that increase in return on equity leads to increase in Z- score and non-performing loan. Likewise, capital adequacy ratio has a positive effect on Z- score and non-performing loan. It indicates that increase in capital adequacy ratio leads to increase in Z- score and non-performing loan. Moreover, there is a negative effect of gross domestic product growth rate on non-performing loan. It indicates that increase in gross domestic product growth rate leads to decrease in non-performing loan. In contrast, interest rate has a positive effect on non-performing loan. It indicates that increase in interest rate leads to increase in non-performing loan. Moreover, inflation rate has a positive effect on return on equity. It indicates that increase in inflation rate leads to increase in non-performing loan.

Keywords: financial distress, Z score, non-performing loan, leverage, return on equity, capital adequacy ratio, interest rate, gross domestic product, inflation

1. Introduction

Financial distress occurs when a firm faces difficulties in meeting its financial obligations, potentially leading to bankruptcy or restructuring. Understanding the determinants of financial distress is crucial for both management and investors, as it helps in identifying risks and taking preventive measures. When a business is in financial trouble, it typically means that its operating cash flow is insufficient to cover its net asset deficit (Geng et al., 2015). A company's operational conditions may worsen, significant financial obligations may become the norm, and salaries may be renegotiated downward when it faces financial difficulties. Insolvency might actually happen if things keep getting worse (Garlappi and Yan, 2011). It can, however, recover and see a resurrection if the right management measures are implemented and financial hardship causes are utilized wisely (Wang and Shiu, 2014). Financial distress is typically the result of a combination of high leverage, poor profitability, liquidity issues, and external economic pressures, among other factors. Companies can mitigate the risk of financial distress by maintaining a balanced capital structure, ensuring adequate liquidity, and managing operations efficiently. Proactive risk management and strategic financial planning are essential for safeguarding against the triggers of financial distress and ensuring long-term financial stability.

According to Keasey et al. (2015), financial distress is the likelihood of a voluntary exit that grows with debt levels and falls with cash, making it difficult for small and medium-sized businesses

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in the UK to pay their bills. The use of tangible assets as security for short-term lending will lower six financial costs that contribute to financial distress, according to a study that looked more into the risk of financial distress. Financial distress is closely linked to the firm's leverage decision. Financial distress is indeed closely linked to a firm's leverage decision, as the level of debt a company takes on significantly influences its financial stability and risk profile. Leverage, which refers to the use of borrowed funds to finance a firm's operations and investments, can magnify both gains and losses. While taking on debt can provide tax advantages and enhance returns on equity during good times, it also increases the firm's fixed financial obligations, such as interest payments. Opler and Titman (1994) discovered that during industry downturns, highly leveraged companies lose significant market share to their more cautiously financed rivals. In industries when output contractions occur, companies in the top leverage decile specifically report a 26 percent loss in revenues compared to companies in the lowest leverage decile. These results support the hypothesis that there are important and beneficial indirect costs associated with financial distress. The study discovered that highly leveraged enterprises involved in research and development suffer the most during economically difficult periods, which is consistent with the hypothesis that firms with specialized products are particularly prone to financial distress. The study also discovered that in concentrated businesses, the negative effects of leverage are more noticeable.

Asyikin et al. (2018) investigated the financial performance of Indonesian sharia commercial banks to forecast financial hardship. The study examined the factors impacting Islamic financial bank distress in Indonesia, including financial performance, capital ratio (CAR), profitability ratios (ROA, ROE), liquidity ratio (FDR), and financial distress efficiency ratios (NOM and BOPO). The analysis's findings demonstrated that CAR significantly and negatively affects financial strain. Financial distress is significantly impacted negatively by ROA. Financial suffering is significantly impacted negatively by ROE. Financial distress is positively and significantly impacted by FDR. Financial strain is significantly impacted negatively by NOM. Financial strain is significantly and favourably impacted by BOPO. When a firm has high leverage, it faces greater financial risk because it must consistently generate sufficient cash flow to meet its debt obligations, regardless of its operational performance. In periods of economic downturn, declining revenues, or unexpected expenses, highly leveraged firms are more vulnerable to financial distress. This is because their reduced ability to cover interest payments and principal repayments can lead to liquidity crises, creditor pressure, and even bankruptcy. The impact of financial performance on the forecast of financial distress was examined by Laksmiwati et al. (2021). Using the Altman Z-Score approach, this study attempts to empirically examine the effects of the Current Ratio (CR), Debt to Equity Ratio (DER), Total Assets Turnover (TATO), and Return on Assets (ROA) on Financial Distress. The study showed the debt-to-equity ratio has no bearing on financial distress, the current ratio significantly and negatively affects it, and the total asset on turnover ratio and return on asset have favourable effects (FD). Al-Homaidi et al. (2018) used a panel data approach to explain the macroeconomic and bank-specific factors that affect the profitability of Indian commercial banks. The study showed that, when assessed by NIM, all bank-specific variables significantly impacted profitability, with the exception of the number of branches. Furthermore, the results demonstrated that every macroeconomic variable included in the analysis had a negative influence on the profitability of Indian commercial banks. Additionally, the findings showed that, when considering Indian commercial banks, the ROA-measured factors of bank size, number of branches, assets management ratio, and leverage ratio are extremely significant predictors of profitability.

Sairin et al. (2019) examined the macroeconomic factors that contribute to financial distress in Malaysia. The findings showed that financial distress companies are significantly impacted by the real interest rate (RIR), the money supply (M2), the producer pricing index (PPI), and the consumer price index (CPI). On the other hand, when it comes to non-financial distress, the money supply (M2),

producer pricing index (PPI), consumer price index (CPI), and gross domestic product (GDP) are the macroeconomic indicators that have the significant impact on these organizations. Khafid et al. (2019) examined how managerial ownership, leverage, and liquidity affected financial distress at Indonesian mining enterprises. The study's findings showed that leverage helps those in financial difficulties. Therefore, managerial ownership and liquidity have no bearing on financial hardship. Furthermore, profitability, however, has been shown to considerably reduce the impact of liquidity on financial distress. Restianti and Agustina (2018) assessed the current ratio, retained earnings to total assets, earnings before interest and tax to total assets, return on equity, debt to assets ratio, and total asset turnover. The findings showed that return on equity and profits before interest tax to total assets influence those who are in financial distress. The financial company's distress is unaffected by the current ratio, retained earnings to total assets, debt to assets ratio, or total assets turnover. The study's conclusion is that by lowering the amount of finance obtained through debt, the company's financial difficulty situation can be prevented. Additionally, a company can lessen and avoid financial trouble by boosting sales and making the most use of its available assets and equity.

In the context of Nepal, Poudel (2012) revealed that high leverage can limit a firm's financial flexibility, making it difficult to raise additional capital or refinance existing debt on favorable terms, further exacerbating the risk of financial distress. Therefore, a firm's leverage decision is a critical determinant of its financial health, with excessive debt increasing the likelihood of financial distress and potential insolvency. Balancing the benefits of leverage with its associated risks is essential for maintaining long-term financial stability. Furthermore, Gnawali (2018) discovered that, in the context of Nepalese government banks, non-performing loans had a negative effect on return on assets. Financial distress is typically the result of a combination of high leverage, poor profitability, liquidity issues, and external economic pressures, among other factors. Companies can mitigate the risk of financial distress by maintaining a balanced capital structure, ensuring adequate liquidity, and managing operations efficiently. Proactive risk management and strategic financial planning are essential for safeguarding against the triggers of financial distress and ensuring long-term financial stability.

The above discussion shows that empirical evidences vary greatly across the studies on the determinants of financial distress. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of this study is to examine the determinants of financial distress of Nepalese commercial banks. Similarly, it examines the effect of institutional variables such as leverage, return on equity, capital adequacy ratio and macroeconomic variables such as gross domestic product, interest rate and inflation on financial distress indicators which are Altman Z-score and non-performing loan in the context of Nepalese commercial banks.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results and the final sections draws conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 12 Nepalese commercial banks from 2014/15 to 2022/23, leading to a total of 108 observations. The study employed stratified sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB), reports published by the Ministry of Finance and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research

designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N	Name of the Bank	Study Period	Observations
1	Nepal Bank Limited	2014/15-2022/23	9
2	Himalayan Bank Limited	2014/15-2022/23	9
3	Everest Bank Limited	2014/15-2022/23	9
4	NMB Bank Limited	2014/15-2022/23	9
5	Nepal SBI Bank Limited	2014/15-2022/23	9
6	Machhapuchchhre Bank Limited	2014/15-2022/23	9
7	Standard chartered Bank Nepal Limited	2014/15-2022/23	9
8	Sanima Bank Limited	2014/15-2022/23	9
9	Siddhartha Bank Limited	2014/15-2022/23	9
10	Agricultural Development Bank Limited	2014/15-2022/23	9
11	Prime Commercial Bank Limited	2014/15-2022/23	9
12	Citizens International Bank limited	2014/15-2022/23	9
Total number of observations			108

Thus, the study is based on 108 observations.

The model

The model used in this study assumes that financial distress depends upon various factors. The dependent variables selected for the study are Altman Z-score and non-performing loan. Similarly, the selected independent variables are leverage, return on equity, capital adequacy ratio, gross domestic product, interest rate and inflation and bank size. Therefore, the models take the following forms:

$$ZS_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 ROE_{it} + \beta_3 CAR_{it} + \beta_4 GDP_t + \beta_5 IR_t + \beta_6 INF_t + e_{it}$$

$$NPL_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 ROE_{it} + \beta_3 CAR_{it} + \beta_4 GDP_t + \beta_5 IR_t + \beta_6 INF_t + e_{it}$$

Where,

ZS= Z-Score as measured by the model proposed by Altman in 1993 as Z-Score= 6.56 X1+ 3.26 X2+ 6.72 X3+ 1.05 X4

Where,

X1= Working capital/total assets

X2= Retained earnings/total assets

X_3 = EBIT/total assets

X_4 = Market capitalization/total liabilities

NPL = Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage.

LEV = Leverage as measured by the ratio of total liabilities to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

CAR = Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage.

GDP = Gross domestic product as measured by the growth rate of gross domestic product, in percentage.

IR = General average interest rate for the fiscal year, in percentage.

INF = Inflation rate as measured by the consumer price index, in percentage.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Leverage

According to Zeitun and Saleh (2015), leverage is the employment of different financial instruments or borrowed funds to raise an investment's potential return. Leverage also has a favourable and statistically significant impact on profitability (Kimathi and Mungai, 2018). Similarly, Foong (2012) discovered a negative correlation between leverage and company performance. Poyry and Maury (2010) also found a negative correlation between leverage and profitability. Rahman et al. (2020) also discovered a noteworthy inverse link between leverage and firm profitability. Based on it, the study develops the following hypothesis:

H_1 : There is a positive relationship between leverage and financial distress.

Capital adequacy ratio

The capital adequacy ratio, or CAR, is a ratio used to assess the level of capital needed to maintain bank-owned assets that may be subject to risk, including credits granted. In a similar vein, Ochei (2013) discovered a positive correlation between the capital adequacy ratio (CAR) and bank profitability. Similarly, Aruwa and Musa (2014) discovered a strong positive correlation between the capital adequacy variable and bank financial performance. Furthermore, a favourable and significant association between capital adequacy and the financial performance of Nigerian banks was demonstrated by Torbira and Zaagha (2016). Additionally, Olalekan and Adeyinka (2013) found a strong and positive correlation between bank profitability and capital adequacy. Based on it, the study develops the following hypothesis:

H_2 : There is a negative relationship between capital adequacy and financial distress.

Return on equity

According to Assaji and Machmuddah (2017), a firm's return on equity (ROE) demonstrated a positive figure, indicating a lower likelihood of financial trouble for the company. The likelihood of corporations experiencing financial difficulties decreasing is suggested by the greater ROE level. On the other hand, a lower ROE rating indicates a larger likelihood of financial hardship for the company. Good corporate growth will inform stakeholders and send a signal (Signalling theory) that the business has been able to grow and preserve its viability. Strong corporate growth is a sign that the business is doing well and is not experiencing financial difficulty. Additionally, Restianti and Agustina (2018) disclosed that a business with great profitability makes a sizable profit. This indicates that there is a lower chance of financial difficulties for the business. Based on it, the study develops the following hypothesis:

H₃: There is a negative relationship between return on equity and financial distress.

Gross domestic product

According to Heffernan and Fu (2010), bank performance is significantly and favourably impacted by both bank listing and efficiency. Furthermore, Van Ewijk and Arnold (2014) concluded that, given the strong and positive correlation between NIM and GDP, investing in interests is preferable in nations with faster GDP growth. Using macroeconomic variables, Altman (1983); Hudson (1997) have forecasted corporate bankruptcy and demonstrated a negative correlation between aggregate failure rates and general business cycle indicators like GDP growth. In a similar vein, Lim and Sek (2015) found that imports of goods and services as well as GDP growth had a major long-term influence on inflation. Based on it, the study develops the following hypothesis:

H₄: There is a negative relationship between gross domestic product and financial distress.

Interest rate

The chance of financial distress was not significantly affected by the variables current ratio, debt to assets ratio, total asset turnover ratio, inflation sensitivity, exchange rate sensitivity, or interest rate sensitivity (Ceylan, 2021). However, return on equity had a detrimental impact on the company's financial difficulties. According to Candradewi and Rahyuda (2021), interest rates have a negligible and unfavourable impact on financial distress. This might happen because if a corporation has a solid leverage ratio, an increase in interest rates won't always result in more financial difficulties. Furthermore, this study's findings indicate that interest rates have no bearing on the IDX's manufacturing enterprises' financial difficulty. The real interest rate (RIR), the money supply (M2), the producer pricing index (PPI), and the consumer price index (CPI) all significantly impact financial distress companies (Sairin et al., 2019). Based on it, the study develops the following hypothesis:

H₅: There is a positive relationship between interest rate and financial distress.

Inflation rate

According to Nurhidayah and Rizqiyah (2017), inflation is the general and persistent trend for prices to rise. The price of items will be affected by inflation, which also indirectly affects consumers' purchasing power and reduces a company's sales turnover. decreased sales will also translate into decreased corporate earnings, allowing financially troubled enterprises to continue operating.

According to Tirapat and Nittayagasetwat (1999), there is a significant positive impact of inflation on financial distress. Similarly, Boyd et al. (2001) demonstrated a noteworthy and inverse correlation between inflation and the banking industry's performance. Based on it, the study develops the following hypothesis:

H₆: There is a positive relationship between inflation rate and financial distress.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2014/15 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are ZS (Z-Score is measured as model proposed by Altman in 1993) and NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total liabilities to total assets, in percentage), ROE (Return on equity as measured by the ratio of net income to total equity, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), GDP (Gross domestic product as measured by the growth rate of gross domestic product, in percentage), INF (Inflation rate as measured by the consumer price index, in percentage) and IR (General average interest rate for the fiscal year, in percentage).

Variables	Minimum	Maximum	Mean	S. D.
ZS	0.661	2.872	1.34	0.36
NPL	0.01	4.93	1.35	1.18
LEV	0.81	0.96	0.88	0.02
ROE	3.78	91.51	16.69	10.88
CAR	7.49	22.99	14.10	2.49
GDP	-2.37	8.98	5.27	3.30
IR	4.56	8.37	6.62	1.00
INF	3.60	9.70	6.02	1.89

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the correlation coefficient between dependent and independent variables of 12 Nepalese commercial banks for the study period of 2014/15 to 2022/23. The dependent variables are ZS (Z-Score is measured as model proposed by Altman in 1993) and NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total liabilities to total assets, in percentage), ROE (Return on equity as measured by the ratio of net income to total equity, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), GDP (Gross domestic product as measured by the growth

rate of gross domestic product, in percentage), INF (Inflation rate as measured by the consumer price index, in percentage) and IR (General average interest rate for the fiscal year, in percentage).

Variables	ZS	NPL	LEV	ROE	CAR	GDP	IR	INF
ZS	1							
NPL	-0.163	1						
LEV	-0.590**	-0.283**	1					
ROE	0.302**	0.210*	-0.272**	1				
CAR	0.635**	0.064	-0.727**	0.312**	1			
GDP	0.339**	-0.135	-0.080	0.213*	-0.058	1		
IR	-0.235*	0.266**	0.177	0.005	-0.221*	0.007	1	
INF	-0.132	0.193*	0.421**	0.136	-0.317**	-0.214*	0.610**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that leverage ratio has a negative relationship with Z- score. It indicates that increase in leverage ratio leads to decrease in Z- score. Similarly, return on equity has a positive relationship with Z- score. It indicates that increase in return on equity leads to increase in Z- score. Likewise, there is a positive relationship between capital adequacy ratio and Z- score. It indicates that increase in capital adequacy ratio leads to increase in Z- score. Further, gross domestic product growth rate has a positive relationship with Z- score. It indicates that higher the gross domestic product growth rate, higher would be the Z- score. In addition, there is a negative relationship between interest rate and Z- score. It indicates that increase in interest rate leads to decrease in Z- score. Moreover, inflation rate has a negative relationship with Z- score. It indicates that increase in inflation rate leads to decrease in Z- score.

Similarly, the result also shows that leverage ratio has a negative relationship with non-performing loan. It indicates that increase in leverage ratio leads to decrease in non-performing loan. Similarly, return on equity has a positive relationship with non-performing loan. It indicates that increase in return on equity leads to increase in non-performing loan. Likewise, there is a negative relationship between gross domestic product growth rate and non-performing loan. It indicates that increase in gross domestic product growth rate leads to decrease in non-performing loan. Further, capital adequacy ratio has a positive relationship with non-performing loan. It indicates that higher the capital adequacy ratio, higher would be the non-performing loan. In contrast, there is a positive relationship between interest rate and non-performing loan. It indicates that increase in interest rate leads to increase in non-performing loan. Moreover, inflation rate has a positive relationship with return on equity. It indicates that increase in inflation rate leads to increase in non-performing loan.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and the results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of leverage, return on equity, capital adequacy ratio, gross domestic product growth rate, interest rate, and inflation rate on Z- score in the context of Nepalese commercial banks.

Table 4

Estimated regression results of leverage, return on equity, capital adequacy ratio, gross domestic product growth rate, interest rate, and inflation rate on Altman Z-score of Nepalese commercial banks

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15-2022/23 by using the linear regression model and the model is $ZS_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 ROE_{it} + \beta_3 CAR_{it} + \beta_4 GDP_{it} + \beta_5 IR_{it} + \beta_6 INF_{it} + e_{it}$ where the dependent variable is ZS (Z-Score is measured as model proposed by Altman in 1993). The independent variables are LEV (Leverage as measured by the ratio of total liabilities to total assets, in percentage), ROE (Return on equity as measured by the ratio of net income to total equity, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), GDP (Gross domestic product as measured by the growth rate of gross domestic product, in percentage), INF (Inflation rate as measured by the consumer price index, in percentage) and IR (General average interest rate for the fiscal year, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		LEV	ROE	CAR	GDP	IR	INF			
1	8.047 (9.028)**	-7.582 (7.526)**						0.342	0.293	56.64
2	1.174 (19.142)**		0.01 (3.266)**					0.083	0.347	10.66
3	0.39 (8.166)**			0.092 (8.457)**				0.397	0.281	71.52
4	1.146 (18.387)**				0.037 (3.707)**			0.106	0.342	13.74
5	1.903 (8.36)**					-0.085 (2.492)*		0.046	0.353	6.21
6	1.494 (12.87)**						-0.025 (1.373)	0.008	0.361	1.88
7	7.489 (8.067)**	-7.047 (6.813)**	0.005 (1.90)*					0.358	0.290	30.82
8	3.428 (2.491)*	-3.378 (2.470)*	0.003 (1.331)	0.060 (3.819)**				0.431	0.273	28.07
9	2.108 (1.671)	-2.265 (1.829)	0.001 (0.235)	0.076 (5.247)**	0.038 (5.124)**			0.543	0.245	32.72
10	2.337 (1.848)	-2.265 (1.829)	0.001 (0.357)	0.077 (6.275)**	0.038 (5.118)**	-0.142 (5.43)**		0.547	0.243	26.86
11	4.556 (4.070)**	-4.751 (4.275)**	-0.005 (2.171)*	0.077 (6.275)**	0.054 (7.993)**	-0.142 (5.43)**	0.106 (6.52)**	0.678	0.205	38.58

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Z-score is the dependent variable.

Table 4 shows that the beta coefficients for capital adequacy ratio are positive with Z-score. It indicates that capital adequacy ratio has a positive impact on Z-score. This finding is similar to the findings of Aruwa and Musa (2014). However, the beta coefficients for leverage ratio are negative with Z-score. It indicates that leverage ratio has a negative impact on Z-score. This finding is not consistent with the findings of Zeitun and Saleh (2015). Likewise, the beta coefficients for gross domestic product growth rate are positive with Z-score. It indicates that gross domestic product growth rate has a positive impact on Z-score. This finding is similar to the findings of Lim and Sek (2015). Moreover, the beta coefficients for interest rate are negative with Z-score. It indicates that interest rate has a negative impact on Z-score. This finding is consistent with the findings of Candradewi and Rahyuda (2021). However, the beta coefficients for inflation rate are negative with Z-score. It indicates that inflation rate has a negative impact on Z-score. This finding is not similar to the findings of Nurhidayah and Rizqiyah (2017). Moreover, the beta coefficients for return on equity are positive with Z-score. It indicates that return on equity has a positive impact on Z-score. This finding is not similar to the findings of Restianti and Agustina (2018).

Table 5 shows the regression results of leverage, return on equity, capital adequacy ratio, gross domestic product growth rate, interest rate, and inflation rate on non-performing loan.

Table 5

Estimated regression results of leverage, return on equity, capital adequacy ratio, gross domestic product growth rate, interest rate, and inflation rate on non-performing loan

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15-2022/23 by using the linear regression model and the model is $NPL_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 ROE_{it} + \beta_3 CAR_{it} + \beta_4 GDP_{it} + \beta_5 IR_{it} + \beta_6 INF_{it} + e_{it}$ where the dependent variable is NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total liabilities to total assets, in percentage), ROE (Return on equity as measured by the ratio of net income to total equity, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), GDP (Gross domestic product as measured by the growth rate of gross domestic product, in percentage), INF (Inflation rate as measured by the consumer price index, in percentage) and IR (General average interest rate for the fiscal year, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		LEV	ROE	CAR	GDP	IR	INF			
1	11.858 (3.428)**	-11.886 (3.040)**						0.072	1.140	9.24
2	0.966 (4.700)**		-11.886 (3.040)**					0.035	1.162	4.879
3	0.966 (4.700)**			0.030 (0.658)				0.005	1.186	0.433
4	1.602 (7.473)**				-0.048 (1.404)			0.009	1.178	1.971
5	-0.728 (0.987)					0.313 (2.846)*		0.062	1.146	8.100
6	0.621 (1.654)						0.120 (2.026)*	0.028	1.166	4.105
7	10.150 (2.799)**	-10.248 (2.537)*	0.016 (1.488)					0.082	1.133	5.782
8	21.316 (3.832)**	-20.336 (3.679)**	0.020 (1.953)	-0.165 (2.598)*				0.130	1.104	6.315
9	24.470 (4.446)**	-22.885 (4.214)**	0.027 (2.620)*	-0.202 (3.216)**	-0.092 (2.804)**			0.184	1.069	7.015
10	22.244 (4.201)**	-23.328 (4.500)**	0.024 (2.454)*	-0.172 (2.831)**	-0.090 (2.865)**	0.336 (3.327)**		0.256	1.02	8.374
11	23.970 (4.313)**	-25.261 (4.578)**	0.020 (1.856)	-0.168 (2.771)**	-0.078 (2.315)*	0.252 (1.943)		0.257	1.02	7.155

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Non-performing loan is the dependent variable.

Table 5 shows that the beta coefficients for capital adequacy ratio are positive with non-performing loan. It indicates that capital adequacy ratio has a positive impact on non-performing loan. This finding is similar to the findings of Torbira and Zaagha (2016). However, the beta coefficients for leverage ratio are negative with non-performing loan. It indicates that leverage ratio has a negative impact on non-performing loan. This finding is not consistent with the findings of Foong (2012). Likewise, the beta coefficients for gross domestic product growth rate are negative with non-performing loan. It indicates that gross domestic product growth rate has a negative impact on non-performing loan. This finding is similar to the findings of Hudson (1997). Moreover, the beta coefficients for interest rate are positive with non-performing loan. It indicates that interest rate has a positive impact on non-performing loan. This finding is consistent with the findings of Ceylan (2021). However, the beta coefficients for inflation rate are positive with non-performing loan. It indicates that inflation rate has a positive impact on non-performing loan. This finding is not similar to the findings of Boyd et al. (2001). Moreover, the beta coefficients for return on equity are positive with non-performing loan. It indicates that return on equity has a positive impact on non-performing loan. This finding is not similar to the findings of Assaji and Machmuddah (2017).

4. Summary and conclusion

The financial distress condition affects the performance and activities of Nepalese commercial banks. Financial distress can severely hamper a bank's ability to operate efficiently. Struggling to generate sufficient revenue, the bank might cut costs in critical areas, leading to reduced service quality, slower transaction processing, and less effective risk management. This deterioration in operational efficiency can further erode customer confidence and lead to a loss of business, exacerbating the distress.

This study attempts to examine the determinants of financial distress condition in the context of Nepalese commercial banks. The study is based on secondary data of 12 commercial banks with 108 observations for the period from 2014/15 to 2022/23.

The major conclusion of the study is that higher profitability, stronger capital buffers, and economic growth contribute to the financial stability and lower risk of insolvency for firms. Conversely, higher debt levels, rising borrowing costs, and inflationary pressures increase the risk of financial distress and instability. The study concluded that capital adequacy ratio followed by leverage are the most influencing factors that determine the Z-score of Nepalese commercial banks. Moreover, non-performing loan is largely determined by leverage and general interest rate in the context of Nepalese commercial banks.

References

- Al-Homaidi, E. A., M. I. Tabash, N. H. Farhan, and F. A. Almaqtari, 2018. Bank-specific and macro-economic determinants of profitability of Indian commercial banks: A panel data approach. *Cogent Economics and Finance* 6(1), 1-26.
- Altman, E. I., 1983. Why businesses fail. *Journal of Business Strategy* 3(4), 15-21.
- Aruwa, S. A., and A. O. Musa, 2014. Risk components and the financial performance of deposit money banks in Nigeria. *International Journal of Social Sciences and Entrepreneurship* 1(11), 514-522.
- Assaji, J. P., and Z. Machmuddah, 2017. Rasio Keuangan dan Prediksi Financial Distress. *Jurnal Penelitian Ekonomi dan Bisnis* 2(2), 58-67.
- Asyikin, J., G. Chandrarin, and H. Harmono, 2018. Analysis of financial performance to predict financial distress in sharia commercial banks in Indonesia. *International Journal of Accounting, Finance, and Economics* 1(2), 11-20.
- Boyd, J. H., R. Levine, and B. D. Smith, 2001. The impact of inflation on financial sector performance. *Journal of monetary Economics* 47(2), 221-248.
- Candradewi, M. R., and H. Rahyuda, 2021. The influence of financial indicators, corporate governance and macroeconomic variables on financial distress. *Jurnal Ekonomi Kuantitatif Terapan* 4(1), 145-152.
- Ceylan, I. E., 2021. The impact of firm-specific and macroeconomic factors on financial distress risk: A case study from Turkey. *Universal Journal of Accounting and Finance* 9(3), 506-517.
- Foong, S., 2012. Leverage, product diversity and performance of general insurers in Malaysia. *The Journal of Risk Finance* 13(4), 347-361.
- Garlappi, L., and H. Yan, 2011. Financial distress and the cross-section of equity returns. *The Journal of Finance* 66(3), 789-822.
- Geng, R., I. Bose, and X. Chen, 2015. Prediction of financial distress: An empirical study of listed Chinese companies using data mining. *European Journal of Operational Research* 241(1), 236-247.
- Gnawali, A., 2018. Non-performing asset and its effects on profitability of Nepalese commercial banks. *International Journal of Research in Business Studies and Management* 5(9), 39-47.
- Heffernan, S. A., and X. Fu, 2010. Determinants of financial performance in Chinese banking. *Applied Financial*

- Economics* 20(20), 1585-1600.
- Hudson, J., 1997. Company bankruptcies and births matter. *Applied Economics* 29(5), 647-654.
- Keasey, K., J. Pindado, and L. Rodrigues, 2015. The determinants of the costs of financial distress in SMEs. *International Small Business Journal* 33(8), 862-881.
- Khafid, M., T. Tusyanah, and T. Suryanto, 2019. Analyzing the determinants of financial distress in Indonesian mining companies. *International Journal of Economics and Business Administration* 7(4), 353-368.
- Kimathi, C. M., and J. Mungai, 2018. Financial distress and profitability of tier three commercial banks in Kenya. *American Journal of Finance* 3(1), 46-66.
- Laksmiwati, M., A. Mappadang, A. Indrabudiman, and V. G. Riza, 2021. Determination of Financial Performance on Prediction Financial Distress. *Asian Journal of Economics, Business and Accounting* 21(22), 46-57.
- Lim, Y. C., and S. K. Sek, 2015. An examination on the determinants of inflation. *Journal of Economics, Business and Management* 3(7), 678-682.
- Nurhidayah, M., and F. Rizqiyah, 2017. Kinerja Keuangan dalam Memprediksi Financial Distress. *Jurnal JIBEKA* 11(1), 42-48.
- Ochei, I. A. 2013. Capital adequacy, management and performance in the Nigerian commercial bank. *African Journal of Business Management* 22(4), 2938-2950.
- Olalekan, A., and S. Adeyinka, 2013. Capital adequacy and banks' profitability: An empirical evidence from Nigeria. *American International Journal of Contemporary Research* 3(10), 87-93.
- Opler, T. C., and S. Titman, 1994. Financial distress and corporate performance. *The Journal of finance* 49(3), 1015-1040.
- Poudel, R. P. S., 2012. The impact of credit risk management on financial performance of commercial banks in Nepal. *International Journal of Arts and Commerce* 1(5), 9-15.
- Poyry, S., and B. Maury, 2010. Influential ownership and capital structure. *Managerial and Decision Economics* 31(5), 311-324.
- Rahman, M. T., R. Nielsen, M. A. Khan, and I. Ankamah-Yeboah, 2020. Impact of management practices and managerial ability on the financial performance of aquaculture farms in Bangladesh. *Aquaculture Economics and Management* 24(1), 79-101.
- Restianti, T., and L. Agustina, 2018. The effect of financial ratios on financial distress conditions in sub industrial sector company. *Accounting Analysis Journal* 7(1), 25-33.
- Sairin, N. H., M. S. Salisi, and I. Bujang, 2019. Determining macroeconomic factor of financial distress in Malaysia. *Malaysian Journal of Business and Economics* 2(2), 14-25.
- Tirapat, S. and A. Nittayagasetwat, 1999. An Investigation of Thai Listed Firms' Financial Distress Using Macro and Micro Variables. *Multinational Finance Journal* 3(2), 103-125.
- Torbira, L., and A. S. Zaagha, 2016. Capital adequacy measures and bank financial performance in Nigeria: A co-integration analysis. *Journal of Finance and Economic Research* 3(1), 15-34.
- Van Ewijk, S. E., and I. J. Arnold, 2014. How bank business models drive interest margins: Evidence from US bank-level data. *The European Journal of Finance* 20(10), 850-873.
- Wang, M. J., and H. R. Shiu, 2014. Research on the common characteristics of firms in financial distress into bankruptcy or recovery. *Investment Management and Financial Innovations* 11(4), 233-243.
- Zeitun, R., and A. S. Saleh, 2015. Dynamic performance, financial leverage and financial crisis: Evidence from GCC countries. *EuroMed Journal of Business* 10(2), 147-162.

Chapter 33

Evaluation of financial stability and soundness of Nepalese commercial banks

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Abstract

This study examines the financial stability and soundness of Nepalese commercial banks. Altman Z-score and return on assets are selected as the dependent variables. The selected independent variables are capital adequacy ratio, non-performing loan, loan loss provision, loan to deposit ratio, leverage, cash reserve ratio and interest rate spread. The study is based on the secondary data which were gathered from 12 commercial banks for the period of 2014/15 to 2022/23. The main sources of data include Banking and Financial Statistics published by Nepal Rastra Bank, Economic Survey Report issued by Ministry of Finance and annual report of respective banks. The correlation coefficients and regression models are estimated to test the significance and importance of factors affecting financial stability and soundness of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive effect on Z-score and return on assets. It indicates that increase in capital adequacy ratio leads to increase in Z-score and return on assets. In addition, non-performing loan has a negative effect on Z-score and return on assets. It indicates that increase in non-performing loan leads to decrease in Z-score and return on assets. Similarly, loan loss provision has a negative effect on Z-score and return on assets. It indicates that increase in loan loss provision leads to decrease in Z-score and return on assets. Likewise, loan to deposit ratio has a negative effect on Z-score and return on assets. It indicates that increase in loan to deposit ratio leads to decrease in Z-score and return on assets. Moreover, leverage has a negative effect on Z-score and return on assets. It indicates that increase in leverage ratio leads to decrease in Z-score and return on assets. Additionally, cash reserve ratio has a positive effect on Z-score and return on assets. It indicates that higher the cash reserve ratio, higher would be the Z-score and return on assets.

Keywords: capital adequacy ratio, non-performing loan, loan loss provision, loan to deposit ratio, leverage, cash reserve ratio, interest rate spread, Altman Z-score, return on asset

1. Introduction

Banks are a vital conduit for economic growth. One cannot overstate the importance of banks in any economic progress. Financial institution facilitates the mobilization of savings from both domestic and foreign sources and direct financial resources toward the most advantageous uses by hedging various risks. Banks are essential to the growth and improvement of trade, business, and industry (Afrin and Johra, 2022). Profitable and efficient banks boost the value to its shareholders and motivate them to make more investments. It will eventually lead to the creation of more job opportunities and economic growth. Any nation's economy, but especially those of emerging nations, depends on banks because without effective savings channels leading to profitable investment possibilities, development cannot be realized. The ability of the financial system, which is made up of markets, financial intermediaries, and market infrastructure, to withstand shocks and the unwinding of financial imbalances is known as financial stability. This reduces the possibility of disruptions in the financial intermediation process that are severe enough to materially hinder the allocation of savings to profitable investment opportunities (Morgan and Pontines, 2018). According to Swamy (2014), bank soundness is defined as the ability to operate efficiently during challenging circumstances, such as changes in policy during a period of financial liberalization. This concept highlights a bank's ability to remain solvent in adverse economic conditions through its capital and reserves. Therefore, banking soundness serves as an indicator of financial health of a country, which is a key responsibility of regulatory bodies in any economy

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(Almahadin, 2022).

Kiemo *et al.* (2019) examined the bank-specific determinants of commercial banks financial stability in Kenya. The study showed that regulatory capital, bank funding, bank size and corporate governance have positive and statistically significant impact on financial stability for commercial banks in Kenya. Similarly, the relationship between financial soundness indicators and financial stability in Nigeria was investigated by Udom *et al.* (2015). The finding indicated that on average the capital-based indicators have positive and high correlation with assets-based indicators which promotes financial stability. Likewise, Ahmad *et al.* (2014) analysed the effect of loan loss provision on the stability and performance of banks working in Pakistan. The study concluded that there is a negative relationship between loan loss provision and profitability of the banks which indicated that less loan loss provision provides more profitability and surely more safety. Moreover, Seyedi and Abdoli (2019) investigated the financial soundness indicators of commercial banks using confirmatory factor analysis and TOPSIS method. The finding indicated that capital adequacy, asset quality, profitability, liquidity, management quality, sensitivity to market risk, Islamic banking, corporate governance, the number of facilities with technical and economic banking have a positive impact on financial soundness, with liquidity and profitability being the most influential. Ilyukhin (2015) investigated the impact of financial leverage and firm performance. The result indicated that return on assets, return on equity, operation margin are negatively affected by the financial leverage. Landjang and Tumiwa (2018) investigated the financial soundness evaluation of selected commercial banks in Indonesia. The study showed a positive relationship between capital to assets ratio, equity to assets ratio, capital adequacy ratio, non-performing loan to loan ratio, and loan to assets ratio with financial soundness. Similarly, Jahan *et al.* (2019) examined the factor affecting financial stability in listed private commercial banks in Bangladesh. The finding postulated that capital to risk weighted assets, non-interest income to non-interest expense, and non-interest income to total revenue have significant positive contribution to uphold financial stability on private commercial banks. Study also found that total debt to total assets ratio have significant but negative consequences on financial stability of private commercial banks.

Salami *et al.* (2021) assessed the bank specific variables and bank financial soundness of bank in Nigeria. The findings indicated that capital adequacy measured by leverage ratio and gross revenue ratio have significant positive impact on the bank financial soundness. In contrast, loan loss provision to net interest revenue and non-performing loan to gross loan have negative influence on financial soundness. The evaluation of financial stability and soundness of the banking sector in Bangladesh was conducted by Afrin and Johra (2022). The result showed that return on asset and equity has positive impact on the bank profitability and stability. In contrast, capital to risk weighted ratio, NPL ratio, liquidity coverage ratio and net stable funding ratio has negatively impacted the soundness as well as stability of banking sector. Similarly, Vong and Chan (2009) examined the impact of bank characteristics as well as macroeconomic and financial structure variables on the performance of the Macao banking industry. The study concluded that provision to total loans ratio and loan loss provision have a significant negative impact on banks' return on assets. Similarly, a study on effect of monetary policy on the banking system stability in Nigeria was conducted by Bamidele *et al.* (2015). The result showed that an increase in monetary policy rate, depreciation of normal exchange rate and rising inflation rate negatively affected the banking system stability. However, similar increase in cash reserve requirement and banking reforms improve the banking system stability.

Islam (2018) evaluated the impacts of loan loss provision maintained for non-performing loan on profitability. The result showed that loan loss provision has a negative impact on profitability of the banks. Further, Mekonnen *et al.* (2015) investigated the soundness of Ethiopian banks. The study showed that capital adequacy ratio has a positive relationship with profitability measured by return on assets and negative relationship with return on equity of the banks. Moreover, Serwadda (2018)

assessed the impact of credit risk management on the financial performance of commercial banks in Uganda. The study concluded that there is a negative significant relationship between nonperforming loans and banks' performance. In addition, Sutrisno (2016) examined the relationship between risk, efficiency, and performances of Islamic bank. The results showed the significant effect of financing to deposit ratio, capital adequacy ratio, operating expense to operating income ratio and size on the performance of Islamic banking.

Oktaviana and Miranti (2024) investigated the factor affecting financial stability of Sharia banks in Indonesia. The finding indicated that the capital adequacy significantly and positively affects the stability of Sharia banks. Similarly, Zeb and Sattar (2017) indicated that leverage ratio and reserve ratio are positively and significantly related to financial stability. Likewise, Bekhet *et al.* (2020) examined the effect of Internal and external factors on profitability of Jordanian commercial banks. The finding indicated that bank profitability in Jordan is affected positively by diversification and bank size. Further, Abid *et al.* (2016) investigated the impact of changes in reserve requirement in bank profitability. The result showed that cash reserve ratio is negatively associated with the bank profitability. In addition, Zubairi and Ahson (2014) examined the strength of linkage between current risk management practices and profitability of five Islamic banks in Pakistan. The finding indicated that there is a negative relationship between interest rates, competition, and taxation with financial performance. Moreover, Aktas *et al.* (2015) examined the impact of bank-dimensional and environmental factors on bank's capital adequacy ratio in South-eastern European region. The study concluded that there is a positive relationship between the return on assets and capital adequacy of the bank.

In the context of Nepal, Pradhan and Parajuli (2017) examined the impact of capital adequacy and bank operating efficiency on financial performance of commercial banks in Nepal. The study revealed that loan ratio, bank operating efficiency, total deposit to total assets and loan loss provision/total equity has a significant positive impact on financial performance whereas loan loss provision/total loan, core capital, risk based capital and total capital ratio have a negative impact on financial performance. Similarly, Ojha (2018) investigated the macroeconomic and bank specific factors affecting liquidity of Nepalese commercial banks. The study stated that return on equity, return on assets, non-performing loan, interbank rate has negative influence on the liquidity of Nepalese commercial banks. The study also revealed that the Gross Domestic Product, Capital Adequacy Ratio, and inflation all positively affect the liquidity of Nepalese commercial banks. The results show that there is significant influence of return on assets, return on equity, non-performing loan, capital adequacy, GDP, and interbank rate on liquidity. Likewise, Adhikari (2021) examines the efficiency, profitability, and stability of Nepalese commercial banks. The empirical evidence suggests a positive and significant relationship between bank efficiency and stability whereas negative and significant relationship was found between bank efficiency and profitability. According to Gwachha (2023), there is a positive and significant impact of bank size, funding risk, liquidity risk, and GDP growth was found on bank stability of Nepal. On the other hand, negative impact of credit risk was found on bank stability.

The above discussion shows that empirical evidence vary greatly across the studies on the evaluation of financial stability and soundness of commercial banks. Though there are above mentioned empirical evidence in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the evaluation of financial stability and soundness of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, non-performing loan, loan loss provision, loan to deposit ratio, leverage, cash reserve ratio and interest rate spread with financial stability and soundness of commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results, and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were gathered from 12 commercial banks for the period of 2014/15 to 2022/23, leading to a total of 108 respondents. The study employed convenient sampling method. The main sources of data include Banking and Financial Statistics published by Nepal Rastra Bank, Economic Survey Report issued by Ministry of Finance and annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with the study period and number of observations

S.N.	Name of the Banks	Study Period	Observations
1	Siddhartha Bank Limited	2014/15-2022/23	9
2	Agricultural Development Bank Limited	2014/15-2022/23	9
3	Prime Commercial Bank Limited	2014/15-2022/23	9
4	Citizens Bank International Limited	2014/15-2022/23	9
5	Nepal Bank Limited	2014/15-2022/23	9
6	Himalayan Bank Limited	2014/15-2022/23	9
7	Machhapuchchhre Bank Limited	2014/15-2022/23	9
8	Standard Chartered Bank Nepal Limited	2014/15-2022/23	9
9	Sanima Bank Limited	2014/15-2022/23	9
10	Everest Bank Limited	2014/15-2022/23	9
11	NMB Bank Limited	2014/15-2022/23	9
12	Nepal SBI Bank Limited	2014/15-2022/23	9
Total number of observations			108

Thus, the study is based on 108 observations.

The model

The model used in this study assumes that financial stability and soundness depends upon capital adequacy ratio, non-performing loan, loan loss provision, and loan to deposit ratio. The dependent variables selected for the study are Altman Z-score and return on asset. Similarly, the selected independent variables are capital adequacy ratio, non-performing loan, loan loss provision, loan to deposit ratio, leverage, cash reserve ratio, and interest rate spread. Therefore, the model takes the following form:

$$ZS_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 LLP_{it} + \beta_4 LDR_{it} + \beta_5 LEV_{it} + \beta_6 CRR_{it} + \beta_7 IRS_{it} + e_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 LLP_{it} + \beta_4 LDR_{it} + \beta_5 LEV_{it} + \beta_6 CRR_{it} + \beta_7 IRS_{it} + e_{it}$$

Where,

ZS = Z-Score is measured as the model proposed by Altman in 1993 as $Z\text{-Score} = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$

Where,

X_1 = working capital/total assets

X_2 = retained earnings/total assets

X_3 = EBIT/total assets

X_4 = market capitalization/total liabilities

ROA = Return on asset as measured by the ratio of net profit after tax to total assets, in percentage.

CAR = Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage.

NPL = Non-performing loan as measured by the ratio of non-performing loan to total loans, in percentage.

LLP = Loan loss provision as measured by the expense set aside as an allowance for bad loans, in billion.

LTD = Loan-to-deposit as measured by the ratio of total loans to total deposits, in percentage.

LEV = Leverage as measured by the ratio of total liabilities to total assets, in percentage.

CRR = Cash reserve ratio as measured by the cash required to kept in reserves as against the banks total deposit, in percentage.

IRS = Interest rate spread as measured by the difference between lending rate and deposit rate, in percentage.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Capital adequacy ratio

A commercial bank's capital adequacy is measured by dividing its equity capital by its total risk-weighted assets (Hafez and El-Ansary, 2015). Sang (2021) analysed the impact of capital adequacy ratio on banks stability. The study revealed that capital adequacy ratio has a positive impact on financial stability. Similarly, Sunaryo (2020) concluded that capital adequacy has a positive and significant effect on return on assets. Likewise, Navas *et al.* (2021) revealed that capital adequacy ratio has a significant and theoretically consistent relationship with all the six dimensions of CAMELS rating. Further, Sangmi and Nazir (2010) showed that capital adequacy ratio has a positive relationship with bank stability and profitability. Based on it, this study develops the following hypothesis:

H_1 : Capital adequacy ratio has a positive relationship with financial stability and soundness of a banks.

Non-performing loan

Non-performing loans are the primary gauge of credit risk in the banking sector and one of the fundamental signs of a bank's health and stability (Koskei, 2020). Doa *et al.* (2020) investigated the effect of non-performing loan on profitability. It indicated that there is a negative relationship between non-performing loan and return on assets. Likewise, Alshebmi *et al.* (2020) indicated a negative relationship of non-performing loan with return on assets and liquidity. Based on it, this study develops the following hypothesis:

H_2 : Non-performing loan has a negative relationship with financial stability and soundness of a banks.

Loan loss provision

According to Ajekwe *et al.* (2017), loan loss provisions is a non-cash charge for banks to

cover potential losses from poor loans. The bank anticipates that a certain number of the loans will default or become sluggish to pay. Ul Mustafa *et al.* (2012) examined the impact of loan loss provision on bank profitability. The finding concluded that loan loss provision is found to have negative and significant association with profitability. Similarly, Ahmad *et al.* (2014) investigated the effect of loan loss provision on bank profitability of commercial banks. The study revealed that there is a negative relationship between loan loss provision and profitability. Likewise, Alhadab and Alsahawneh (2016) examined the impact of loan loss provision on bank profitability. It concluded that loan loss provision has a negative impact on the profitability of Jordan commercial banks. Moreover, Meher and Getaneh (2019) stated that financial sustainability can be attained by reducing the provisioning of loan loss. Based on it, this study develops the following hypothesis:

H₃: Loan loss provision has a negative relationship with financial stability and soundness of a banks.

Loan to deposit ratio

According to Sari and Septiano (2020), loan to deposit ratio demonstrates a bank's ability to give loans to debtors with its own capital and monies available for public collection. Koskei (2020) identified that loan to deposit ratio specified a positive and non-statistically insignificant relationship with banks financial stability. According to Kozaric and Zunic (2014), liquidity ratio has a positive relationship with financial soundness and hence enhance stability. Similarly, Lorencic and Festic (2021) revealed that loan to deposit ratio has a positive and significant impact on credit growth and financial stability. Likewise, Rajindra *et al.* (2021) examined the effect of operating cost and income, loan to deposit ratio on return on assets. The study showed a positive impact of loan to deposit ratio on return on assets. Based on it, this study develops the following hypothesis:

H₄: Loan to deposit ratio has a positive relationship with financial stability and soundness of a banks.

Leverage

The debt-to-equity ratio is an essential statistic for measuring financial leverage. This ratio indicates how much debt corporations employ to fund their financial activities. It also demonstrates the link between debt and equity value (Tugas, 2012). Azhar *et al.* (2021) showed that leverage has a positive relationship with Z-score. Likewise, Iqbal and Usman (2018) revealed that leverage has a positive and significant impact on return on assets. According to Zelalem (2020), debt equity ratio which is considered as a measure of financial leverage have a significant positive effect on the bank performance. Similarly, Menacer (2020) examined the impact of financial leverage on Islamic bank performance in GCC countries. The study showed that leverage has a significant impact on financial performance. Based on it, this study develops the following hypothesis:

H₅: Leverage ratio has a positive relationship with financial stability and soundness of a banks.

Cash reserve ratio

The portion of a bank's deposit that it must maintain as cash reserve with the RBI is known as the cash reserve ratio (Sumathy and Jisha, 2022). Kim and Kwon (2023) identified that central bank digital currency does not require reserve holding to enhance financial stability. Similarly, Hoque *et al.* (2020) investigated the impact of cash reserve ratio on profitability. The study revealed that cash reserve ratio has a negative impact on the profitability of commercial banks in Bangladesh. Likewise, Udeh (2015) concluded that cash reserve ratio does not have a significant impact on the profitability of commercial banks in Nigeria. Moreover, Arora and Sharma (2017) showed that cash reserve ratio is negatively associated with bank profitability. Based on it, this study develops the following hypothesis:

H₆: Cash reserve ratio has a negative relationship with financial stability and soundness of a banks.

Interest rate spread

The difference between interest paid on deposits and other interest-bearing liabilities and interest gained on loans, securities, and other interest-earning assets is known as the net interest rate spread (Kamran *et al.*, 2016). Islam and Rahman (2017) showed that there is a significant impact of interest rate spread on both return on assets and return on equity. Similarly, Berko *et al.* (2022) found that interest rate spread is statistically important determinants of economic growth but have negative impact in both long-run and short-run. Likewise, Ullah and Khan (2021) examined the impact of interest rate spread and other bank specific variables on profitability. The finding revealed that interest rate spread has a positive and significant association with profitability of banks operating in Pakistan. Based on it, this study develops the following hypothesis:

H₇: Interest rate spread has a positive relationship with financial stability and soundness of a banks.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2014/15 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 12 Nepalese commercial banks for the study period of 2014/15 to 2022/23. The dependent variables are ZS (Z-Score is measured as model proposed by Altman in 1993) and ROA (Return on asset as measured by the ratio of net profit after tax to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage), LLP (Loan loss provision as measured by the expense set aside as an allowance for bad loans, in percentage), LTD (Loan-to-deposit as measured by the ratio of total loans to total deposits, in percentage), LEV (Leverage as measured by the amount of total liabilities to total assets, in percentage), CRR (Cash reserve ratio as measured by the cash required to kept in reserves as against the banks total deposit, in percentage) and IRS (Interest rate spread as measured by the difference between lending rate and deposit rate, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
Z-Score	0.66	2.87	1.34	0.36
ROA	0.47	3.56	1.59	0.53
CAR	7.49	22.99	14.10	2.49
NPL	0.01	4.93	1.34	1.18
LLP	13.36	858.52	210.74	163.07
LDR	0.09	1.02	0.82	0.12
LEV	0.81	0.96	0.88	0.02
CRR	0.25	36.21	15.25	9.54
IRS	3.09	7.15	4.22	0.65

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, the Pearson's correlation coefficient has been completed and result has been shown in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the correlation coefficient between dependent and independent variables of 12 Nepalese commercial banks for the study period of 2014/15 to 2022/23. The dependent variables are ZS (Z-Score is measured as model proposed by Altman in 1993) and ROA (Return on asset as measured by the ratio of net profit after tax to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage), LLP (Loan loss provision as measured by the expense set aside as an allowance for bad loans, in percentage), LTD (Loan-to-deposit as measured by the ratio of total loans to total deposits, in percentage), LEV (Leverage as measured by the amount of total liabilities to total assets, in percentage), CRR (Cash reserve ratio as measured by the cash required to kept in reserves as against the banks total deposit, in percentage) and IRS (Interest rate spread as measured by the difference between lending rate and deposit rate, in percentage).

Variables	Z-Score	ROA	CAR	NPL	LLP	LDR	LEV	CRR	IRS
Z-Score	1								
ROA	0.612**	1							
CAR	0.635**	0.392**	1						
NPL	-0.163	-0.037	0.064	1					
LLP	-0.369**	-0.376**	0.069	0.695**	1				
LDR	-0.262**	-0.069	-0.047	0.115	0.190*	1			
LEV	-0.590**	-0.455**	-0.727**	-0.283**	-0.112	-0.175	1		
CRR	0.053	0.127	0.223*	0.204*	0.097	0.081	-0.201*	1	
IRS	0.278**	0.471**	0.256**	0.328**	0.082	0.028	-0.254**	0.251**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows there is a positive relationship between capital adequacy ratio and Z-score. It indicates that increase in capital adequacy ratio leads to increase in Z-score. In contrast, there is a negative relationship between non-performing loan and Z-score. It indicates that increase in non-performing loan leads to decrease in Z-score. Similarly, there is a negative relationship between loan loss provision and Z-score. It indicates that increase in loan loss provision leads to decrease in Z-score. Likewise, there is a negative relationship between loan to deposit ratio and Z-score. It indicates that increase in loan to deposit ratio leads to decrease in Z-score. Moreover, there is a negative relationship between leverage and Z-score. It indicates that increase in leverage leads to decrease in Z-score. Additionally, there is a positive relationship between cash reserve ratio and Z-score. It indicates that higher the cash reserve ratio, higher would be the Z-score. Similarly, there is a positive relationship between interest rate spread and Z-score. It indicates that increase in interest rate spread leads to increase in Z-score.

Similarly, the result shows that there is a positive relationship between capital adequacy ratio and return on assets. It indicates that that increase in capital adequacy ratio leads to increase in return on assets. In contrast, non-performing loan has a negative relationship with return on assets. It indicates that increase in non-performing loan leads to decrease in return on assets. Similarly, there is a negative relationship between loan loss provision and return on assets. It indicates that increase in loan loss provision leads to decrease in return on assets. Likewise, loan to deposit ratio has a negative relationship with return on assets. It indicates that increase in non- loan to deposit ratio and leverage leads to decrease in return on assets. Moreover, leverage has a negative relationship with return on assets. It indicates that increase in leverage leads to decrease in return on assets. Additionally, there is a positive relationship between cash reserve ratio and return on assets. It indicates that higher the cash reserve ratio, higher would be the return on assets. Similarly, there is a positive relationship between interest rate spread and return on assets. It indicates that increase in interest rate spread leads to increase in return on assets.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of capital adequacy ratio, non-performing loan, loan loss provision, loan to deposit ratio, leverage, cash reserve ratio and interest rate spread with Altman Z-score of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, non-performing loan, loan loss provision, loan to deposit ratio, leverage, cash reserve ratio and interest rate spread on Altman Z-score

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15 to 2022/23 by using the linear regression model and the model is $ZS_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 LLP_{it} + \beta_4 LDR_{it} + \beta_5 LEV_{it} + \beta_6 CRR_{it} + \beta_7 IRS_{it} + e_{it}$ where the dependent variable is ZS (Z-Score is measured as model proposed by Altman in 1993). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage), LLP (Loan loss provision as measured by the expense set aside as an allowance for bad loans, in percentage), LTD (Loan-to-deposit as measured by the ratio of total loans to total deposits, in percentage), LEV (Leverage as measured by the amount of total liabilities to total assets, in percentage), CRR (Cash reserve ratio as measured by the cash required to kept in reserves as against the banks total deposit, in percentage) and IRS (Interest rate spread as measured by the difference between lending rate and deposit rate, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		CAR	NPL	LLP	LDR	LEV	CRR			
1	0.039 (0.25)	0.092 (8.45)**						0.397	0.281	71.52
2	1.409 (26.85)**		0.092 (8.45)**					0.018	0.359	2.91
3	1.515 (28.39)**			-0.001 (4.09)**				0.128	0.338	16.75
4	1.987 (8.50)**				-0.786 (2.79)**			0.060	0.351	7.79
5	8.047 (9.02)**					-7.582 (7.52)**		0.342	0.293	56.64
6	1.311 (19.81)**						0.002 (0.54)	0.007	0.363	0.296
7	0.691 (3.13)**							0.154 (2.98)**	0.349	8.88
8	0.691 (3.13)**	0.094 (8.89)**	-0.063 (2.81)**					0.434	0.272	42.03
9	0.691 (3.13)**					-7.760 (7.53)**	0.002 (0.54)	0.341	0.294	28.62
10	10.095 (7.061)**			-0.001 (2.561)*	-0.786 (2.79)**	-8.832 (2.069)*		0.619	0.223	58.92
11	10.095 (7.061)**	0.043 (3.28)**	-0.063 (2.81)**			-5.510 (4.23)**	0.003 (1.24)	0.128 (3.20)**	0.545	0.244
12	6.362 (5.09)**	0.043 (3.28)**	-0.063 (2.81)**	-0.001 (4.10)**	-0.755 (4.24)**	-0.755 (4.24)**	0.003 (1.31)	0.094 (2.73)**	0.683	0.203

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Z-score is the dependent variable.

Table 4 shows that the beta coefficients for capital adequacy ratio are positive with Z-score. It indicates that capital adequacy ratio has a positive impact on Z-score. This finding is similar to the findings of Sang (2021). In contrast, the beta coefficients for non-performing loan are negative with Z-score. It indicates that non-performing loan has a negative impact Z-score. This finding is consistent with the findings of Ozili (2019). Similarly, the beta coefficients for loan loss provision are negative with Z-score. It indicates that loan loss provision has a negative impact on Z-score. This finding is consistent with the findings of Meher and Getaneh (2019). Likewise, the beta coefficients for loan to deposit ratio are negative with Z-score. It indicates that loan to deposit ratio has a negative impact on

Z-score. This result is contradicted with the results of Koskei (2020). Furthermore, the beta coefficients for leverage are negative with Z-score. It indicates that leverage has a negative impact Z-score. This finding is not consistent with the findings of Azhar *et al.* (2021). Moreover, the beta coefficients for cash reserve ratio are negative with Z-score. It indicates that cash reserve ratio has a negative impact on Z-score. This finding is not consistent with the findings of Kim and Kwon (2023). Likewise, the beta coefficients for interest rate spread are positive with z-score. It indicates that interest rate spread has a positive impact on Z-score. This finding is not consistent with the findings of Berko *et al.* (2022).

Table 5 shows the regression results of capital adequacy ratio, non-performing loan, loan loss provision, loan to deposit ratio, leverage, cash reserve ratio and interest rate spread with return on assets of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratio, non-performing loan, loan loss provision, loan to deposit ratio, leverage, cash reserve ratio and interest rate spread on return on asset

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15 to 2022/23 by using the linear regression model and the model $ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 LLP_{it} + \beta_4 LDR_{it} + \beta_5 LEV_{it} + \beta_6 CRR_{it} + \beta_7 IRS_{it} + e_{it}$ where the dependent variables is ROA (Return on asset as measured by the ratio of net profit after tax to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage), LLP (Loan loss provision as measured by the expense set aside as an allowance for bad loans, in percentage), LTD (Loan-to-deposit as measured by the ratio of total loans to total deposits, in percentage), LEV (Leverage as measured by the amount of total liabilities to total assets, in percentage), CRR (Cash reserve ratio as measured by the cash required to kept in reserves as against the banks total deposit, in percentage) and IRS (Interest rate spread as measured by the difference between lending rate and deposit rate, in percentage).

Model	Intercept	Regression coefficients of							Adj. R_bar ²	SEE	F-value
		CAR	NPL	LLP	LDR	LEV	CRR	IRS			
1	0.410 (1.49)	0.084 (4.38)**							0.145	0.493	19.20
2	1.615 (20.63)**		-0.017 (0.37)						0.008	0.535	0.142
3	1.615 (20.63)**			-0.001 (4.17)**					0.133	0.496	17.41
4	1.842 (5.18)**				-0.303 (0.70)				0.005	0.534	0.502
5	9.200 (6.35)**					-8.602 (5.25)**			0.199	0.477	27.64
6	1.484 (15.33)**						0.007 (1.32)		0.007	0.531	1.74
7	-0.029 (0.09)							0.384 (5.49)**	0.214	0.472	30.20
8	0.435 (1.57)	0.085 (4.40)**	-0.028 (0.69)						0.141	0.494	9.79
9	9.042 (6.02)**			-0.001 (5.37)**	-0.350 (1.01)	-8.459 (5.04)**	0.002 (0.42)		0.193	0.479	13.80
10	10.790 (7.84)**					-9.748 (6.64)**			0.380	0.420	22.81
11	7.835 (3.49)**	0.008 (0.30)	-0.142 (3.69)**			-8.546 (3.87)**	0.002 (0.42)	0.384 (5.66)**	0.395	0.414	14.9
12	6.357 (2.81)**	6.357 (2.81)**	-0.044 (0.87)	-0.002 (5.00)**	-0.220 (0.68)	-6.564 (3.06)**	0.001 (0.29)	0.001 (0.29)	0.522	0.368	17.67

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 5 shows that the beta coefficients for capital adequacy ratio are positive with return on asset. It indicates that capital adequacy ratio has a positive impact on return on asset. This finding

is similar to the findings of Sunaryo (2020). Similarly, the beta coefficients for non-performing loan are positive with return on asset. It indicates non-performing loan has a positive impact on return on asset. This finding is consistent with the findings of Landjang and Tumiwa (2018). In contrast, the beta coefficients for loan loss provision are negative with return on asset. It indicates that loan loss provision has a negative impact on return on asset. This finding is consistent with the findings of Mustafa *et al.* (2012). Likewise, the beta coefficients for loan to deposit ratio are negative with return on assets. It indicates that loan to deposit ratio has a negative impact on return on asset. This finding is contradicted with the findings of Rajindra *et al.* (2021). Furthermore, the beta coefficients for leverage are negative with return on assets. It indicates that leverage has a negative impact on return on asset. This result is not similar to the results of Iqbal and Usman (2018). In addition, the beta coefficients for cash reserve ratio are negative with return on assets. It indicates that cash reserve ratio has a negative impact on return on assets. This finding is consistent with the findings of Hoque *et al.* (2020). Moreover, the beta coefficients for interest rate spread are positive with return on assets. It indicates that interest rate spread has a positive impact on return on asset. This finding is similar to the findings of Ullah and Khan (2021).

4. Summary and conclusion

The foundation of any nation's economy is its financial sector, which powers long-term expansion through effective monetary intermediation. It encourages investment, by funding business ventures, generating savings, effectively allocating resources, and promoting the exchange of goods and services. Financial stability exists when the financial system can handle economic shocks and continue to perform its main functions. Banking soundness serves as an indicator of financial health of a country, which is a key responsibility of regulatory bodies in any economy. Banks are a vital conduit for economic growth. One cannot overstate the importance of banks in any economic progress. Financial institution facilitates the mobilization of savings from both domestic and foreign sources and direct financial resources toward the most advantageous uses by hedging various risks. It goes without saying that banks are essential to the growth and improvement of trade, business, and industry. Profitable and efficient banks boost the value to its shareholders and motivate them to make more investments. It will eventually lead to the creation of more job opportunities and economic growth. Any nation's economy, but especially those of emerging nations, depends on banks because without effective savings channels leading to profitable investment possibilities, development cannot be realized.

This study attempts to analyse the evaluation of financial stability and soundness of Nepalese commercial banks. The study is based on secondary data of 12 commercial banks with 108 observations for the period from 2014/15 to 2022/23.

The major conclusion of this study is that capital adequacy ratio, cash reserve ratio and interest rate spread have positive impact on Altman Z-score and return on assets. It indicates that increase in capital adequacy ratio, cash reserve ratio and interest rate leads to increase in Altman Z-score and return on assets. However, non-performing loan, loan loss provision, loan to deposit ratio and leverage have negative impact on Altman Z-score and return on assets. It indicates that increase in non-performing loan, loan loss provision, loan to deposit ratio and leverage leads to decrease in Altman Z-score and return on assets. Likewise, the study also concluded that capital adequacy ratio followed by leverage is the most influencing factor that explains the changes in the Altman Z-score in the context of Nepalese commercial banks. Similarly, the study also concluded that interest spread rate followed by leverage is the most influencing factor that explains the changes in the return on assets in the context of Nepalese commercial banks.

References

- Abid, S. F., C. Author, and S. Lodhi, 2016. Impact of changes in reserve requirement on banks profitability: A case of commercial banks in Pakistan. *Australian Journal of Business Science Design and Literature* 9(1), 1-7.
- Adhikari, P. R., 2021. Efficiency, profitability, and stability of Nepalese commercial banks. *The Batuk* 7(2), 15-36.

- Afrin, T., and F. T. Johra, 2022. An evaluation of financial stability and soundness of the banking sector in Bangladesh. *Journal of Business Administration* 43(1), 1-31.
- Ahmad, F., S. H. Tahir, and B. Aziz, 2014. Impact of loan loss provision on bank profitability in Pakistan. *Research Journal of Social Science and Management* 3(12), 34-41.
- Ajekwe, C. C., A. Ibiameke, and M. F. Silas, 2017. Loan loss provisions, earnings smoothing and capital management under IFRS: The case of Deposit Money Banks in Nigeria. *American Journal of Management Science and Engineering* 2(4), 58-64.
- Aktas, R., B. Bakin, and C. Gokhan, 2015. The determinants of bank's capital adequacy ratio: some evidence from south-eastern European countries. *Journal of Economics and Behavioural Studies* 7(1), 79-88.
- Alhadab, M., and S. Alsahawneh, 2016. Loan loss provision and the profitability of commercial banks: Evidence from Jordan. *International Journal of Business and Management* 11(12), 242-248.
- Almahadin, H. A., 2022. Spill over effects of US monetary policy on banking development: Evidence from the Asian region. *Global Business Review* 23(1), 7-19.
- Alshebmi, A. S., M. H. M. Adam, A. M. Mustafa, and M. T. D. O. E. Abdelmaksoud, 2020. Assessing the non-performing loans and their effect on banks profitability: Empirical evidence from the Saudi Arabia banking sector. *International Journal of Innovation, Creativity and Change* 11(8), 69-93.
- Arora, M. K., and M. Sharma, 2017. Impact of cash reserve ratio and statutory liquidity ratio on the profitability of the public sector banks in India. *The Research Repository* 4(1), 53-58.
- Azhar, N. I. H., N. Lokman, M. M. Alam, and J. Said, 2021. Factors determining Z-score and corporate failure in Malaysian companies. *International Journal of Economics and Business Research* 21(3), 370-386.
- Bamidele, A., J. Musa, L. Bala-Keffii, O. Owolabi, and S. Imam, 2015. Effects of monetary policy on the banking system stability in Nigeria. *Economic and Financial Review* 53(2), 1-18.
- Bekhet, H. A., A. M. Alsmadi, and M. Khudari, 2020. Effects of internal and external factors on profitability of Jordanian commercial banks: Panel data approach. *International Journal of Financial Research* 11(5), 359-375.
- Berko, D., P. Hammond, and E. Amissah, 2022. The effect of interest rate spread on economic growth: Ghana's perspective. *International Journal of Business and Management Review* 10(2), 1-23.
- Doa, H. L., T. X. Ngoa, and Q. A. Phunga, 2020. The effect of non-performing loans on profitability of commercial banks: Case of Vietnam. *Accounting* 6(3), 373-386.
- Gwachha, K. P., 2023. An analysis of the determinants of bank stability in the banking industry of Nepal. *Khwopa Journal* 5(2), 196-210.
- Hafez, H. M., and O. A. El-Ansary, 2015. Determinants of capital adequacy ratio: An empirical study on Egyptian banks. *Corporate Ownership and Control* 13(1), 1166-1176.
- Hoque, M. A., A. Ahmad, M. M. Chowdhury, and M. Shahidullah, 2020. Impact of monetary policy on bank's profitability: A study on listed commercial banks in Bangladesh. *International Journal of Accounting and Finance Review* 5(2), 72-79.
- Ilyukhin, E., 2015. The impact of financial leverage on firm performance: Evidence from Russia. *Journal of Corporate Finance Research* 9(2), 24-36.
- Iqbal, U., and M. Usman, 2018. Impact of financial leverage on firm performance: Textile composite companies of Pakistan. *Journal of Management* 1(2), 70-78.
- Islam, F. T., 2018. Evaluating loan loss provisioning for non-performing loans and its impact on the profitability of commercial banks in Bangladesh. *Asian Finance and Banking Review* 2(2), 33-41.

- Islam, T. T., and N. Rahman, 2017. Interest spread on the profitability of Islamic banks and business. *Social and Scientific Research* 5(3), 01-06.
- Jahan, K., M. A. Kabir, and F. N. Saima, 2019. Determinants of financial stability: evidence from listed private commercial banks in Bangladesh. *Daffodil International University Journal of Business and Entrepreneurship* 12(2), 13-28.
- Kamran, H. W., Z. Johnson, and M. Sammer, 2016. Determinants of profitability in Banking Sector. *International Journal of Information Research and Review* 3(5), 2258-2264.
- Kiemo, S. M., T. O. Olweny, W. M. Muturi, and L. W. Mwangi, 2019. Bank-specific determinants of commercial banks financial stability in Kenya. *Journal of Applied Finance and Banking* 9(1), 119-145.
- Kim, Y. S., and O. Kwon, 2023. Central bank digital currency, credit supply, and financial stability. *Journal of Money, Credit and Banking* 55(1), 297-321.
- Koskei, L., 2020. Non-performing loans and banks' financial stability in Kenya; Evidence from commercial banks. *Asian Journal of Economics, Business, and Accounting* 15(3), 44-52.
- Kozaric, K., and E. Zunic, 2014. Financial soundness indicators in Bosnia and Herzegovina banking sector. *UTMS Journal of Economics* 5(2), 159-168.
- Landjang, X. I., and J. Tumiwa, 2018. Financial Soundness Evaluation of Selected Commercial Banks in Indonesia: An Application of Bankometer Model. *Journal of ASEAN Studies on Maritime Issues* 3(5), 28-39.
- Lorencic, E., and M. Festic, 2021. The impact of seven macroprudential policy instruments on financial stability in six euro area economies. *Review of Economic Perspectives* 21(3), 259-290.
- Meher, K., and H. Getaneh, 2019. Impact of determinants of the financial distress on financial sustainability of Ethiopian commercial banks. *Banks and Bank Systems* 14(3), 187.
- Mekonnen, Y., H. Kedir, and M. Shibr, 2015. Soundness of Ethiopian Banks. *International Journal of Finance and Banking Studies* 4(2), 29-37.
- Menacer, A., A. Y. Saif-Alyousfi, and N. H. Ahmad, 2020. The effect of financial leverage on the Islamic banks' performance in the Gulf Cooperation Council (GCC) countries. *International Journal of Financial Research* 11(1), 13-24.
- Morgan, P. J., and V. Pontines, 2018. Financial stability and financial inclusion: The case of SME lending. *The Singapore Economic Review* 63(01), 111-124.
- Navas, J., P. Dhanavanthan, and D. Lazar, 2021. Is risk based capital ratio a true measure of the soundness of banks? Evidence from India. *International Journal of Financial Research* 12(3), 92-102.
- Ojha, P. R., 2018. Macroeconomics and bank-specific factors affecting liquidity: A study of Nepali commercial banks. *Journal of Business and Social Sciences* 2(1), 79-87.
- Oktaviana, U. K., and T. Miranti, 2024. Factors affecting financial stability of sharia banks in Indonesia. *Journal of Economics and Business* 9(2), 245-260.
- Pradhan, R. S., and P. Parajuli, 2017. Impact of capital adequacy and cost income ratio on performance of Nepalese commercial banks. *International Journal of Management Research* 8(1), 6-18.
- Rajindra, R., G. Guasmin, B. Burhanuddin, and R. N. Anggraeni, 2021. Costs and operational revenue, loan to deposit ratio against return on assets: A case study in Indonesia. *The Journal of Asian Finance, Economics and Business* 8(5), 109-115.
- Salami, A. A., A. B. Uthman, and M. Sanni, 2021. Bank-specific variables and banks' financial soundness: Empirical evidence from Nigeria. *Zagreb International Review of Economics and Business* 24(1), 37-66.
- Sang, N. M., 2021. Capital adequacy ratio and a bank's financial stability in Vietnam. *Banks and Bank Systems* 16(4),

61-71.

- Sangmi, M. U. D., and T. Nazir, T. 2010. Analysing financial performance of commercial banks in India: Application of CAMEL model. *Pakistan Journal of Commerce and Social Sciences (PJCSS)* 4(1), 40-55.
- Sari, L., and R. Septiano, 2020. Effects of intervening loan to deposit ratio on profitability. *Journal of Accounting and Finance Management* 1(5), 228-241.
- Serwadda, I., 2018. Impact of credit risk management systems on the financial performance of commercial banks in Uganda. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis* 66(6), 1627-1635.
- Seyedi, S. A., and M. R. Abdoli, 2019. Modelling and rating financial soundness indicators of commercial banks using confirmatory factor analysis and TOPSIS method. *Iranian Journal of Finance* 3(3), 107-136.
- Sumathy, M., and T. P. Jisha, 2022. Monetary policy and profitability of bank; with special reference to State Bank of India. *RVIM Journal of Management Research* 14(1), 37-41.
- Sunaryo, D., 2020. The effect of capital adequacy ratio (CAR), net interest margin (NIM), non-performing loan (NPL), and loan to deposit ratio (LDR) against return on Asset (ROA) in general banks in Southeast Asia 2012-2018. *International Journal of Management* 1(4), 149-158.
- Sutrisno, N., 2016. Risk, efficiency, and performance of Islamic banking: empirical study on Islamic bank in Indonesia. *Asian Journal of Economic Modelling* 4(1), 47-56.
- Swamy, V., 2014. Testing the interrelatedness of banking stability measures. *Journal of Financial Economic Policy* 6(1), 25-45.
- Tugas, F. C., 2012. A comparative analysis of the financial ratios of listed firms belonging to the education subsector in the Philippines for the years 2009-2011. *International Journal of Business and Social Science* 3(21), 173-190.
- Udeh, S. N., 2015. Impact of monetary policy instruments on profitability of commercial banks in Nigeria: Zenith bank experience. *Research Journal of Finance and Accounting* 6(10), 190-205.
- Udom, I., B. Onwe, and O. Eze, 2015. The relationship between financial soundness indicators and financial stability in Nigeria. *Journal of Money, Investment and Banking* 30(1), 110-121.
- Ul Mustafa, A. R., R. H. Ansari, and M. U. Younis, 2012. Does the loan loss provision affect the banking profitability in case of Pakistan? *Asian Economic and Financial Review* 2(7), 772-783.
- Ullah, Z., and M. Z. Khan, 2021. Impact of interest rate spread on the profitability of all commercial banks in Pakistan. *Indian Journal of Economics and Development* 9(1), 1-6.
- Vong, P. I., and H. S. Chan, 2009. Determinants of bank profitability in Macao. *Macau Monetary Research Bulletin* 12(6), 93-113.
- Zeb, S., and A. Sattar, 2017. Financial regulations, profit efficiency, and financial soundness: Empirical evidence from commercial banks of Pakistan. *The Pakistan Development Review* 56(2), 85-103.
- Zelalem, D., 2020. The impact of financial leverage on the performance of commercial banks: Evidence from selected commercial banks in Ethiopia. *International Journal of Accounting, Finance and Risk Management* 5(1), 62-68.
- Zubairi, H. J., and S. Ahson, 2014. Impact of risk management practices on profitability of Islamic banks in Pakistan. *Global Economy and Finance Journal* 5(1), 83-98.

Chapter 34

Impact of macroeconomic variables on money supply in Nepalese economy

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Abstract

This study examines the impact of macroeconomic variables on money supply in Nepalese economy. Money supply and money supply to gross domestic product ratio are the selected dependent variables. The selected independent variables are inflation, gross domestic product, cash reserve ratio, import, export, and exchange rate. The study is based on secondary data for the study period from 2000/01 to 2022/23. The main sources of data include Bank supervision report, Economic Survey published by Ministry of Finance and reports published by World Bank. The correlation coefficients and regression models are estimated to test the significance and importance of macro-economic variables on the money supply in Nepalese economy.

The study showed that gross domestic products have a positive effect on money supply and money supply to gross domestic product ratio. It indicates that higher the gross domestic product, higher would be the money supply and money supply to gross domestic product ratio. Similarly, inflation has a positive effect on money supply suggesting that increase in inflation rate leads to increase in money supply and money supply to gross domestic product ratio. However, exchange rate has a positive effect on money supply and money supply to gross domestic product ratio. It implies that increase in exchange rate with US Dollar leads to increase in money supply and money supply to gross domestic product ratio. Likewise, imports (BOP-M) also have a positive effect on money supply indicating that increase in imports leads to increase in money supply and money supply to gross domestic product ratio. Moreover, exports (BOP-X) have a positive effect on money supply, indicating higher export results in higher money supply and money supply to gross domestic product ratio. However, cash reserve ratio (CRR) exhibits a negative effect on money supply and money supply to gross domestic product ratio. It implies that higher reserve requirements are associated with a lower money supply and money supply to gross domestic product ratio.

Keywords: inflation, gross domestic products, money supply, cash reserve ratio, import, export

1. Introduction

Money supply is a crucial factor in determining the overall health and performance of a nation's economy. A growing money supply can stimulate economic growth by increasing liquidity in the economy, making more funds available for consumer spending and business investments. However, if the money supply increases too rapidly, it can overheat the economy, leading to unsustainable growth and asset bubbles. The money supply is a powerful tool in the hands of central banks, such as Nepal Rastra Bank, to manage economic stability. The money supply is one of the important factors responsible for the changes in the macroeconomic variables in the economy and has fundamental importance in the economic discipline. A change in money supply amount can have a significant effect on the major macroeconomic indicators (Yunana *et al.*, 2014). Intermediate target of monetary policy, money supply, has a very important role in macroeconomic regulation (Jing-Xin and Yuan, 2012). Additionally, the supply of money can be regulated through changes in liquidity ratio as well as money outside the bank (in the hands of the non-bank public) through the bank discount rate. Changes in the banks' discount rate affect the money supply by affecting the volume of discount loans and the monetary base. A rise (fall) in discount loans increases (reduces) monetary base and expands (shrinks) money supply in the economy. According to Jhingan (2008), an alteration in the level of economic activities that affect the desire of the economic agents in terms of currency holding in relation to the deposits determines the supply of money.

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Anjum *et al.* (2020) examined the nexus between money supply and economic growth in Bangladesh using an ARDL Approach. This study has attempted to examine the dynamic impact of money supply (M2) on the economic growth proxied by per capita GDP growth in Bangladesh spanning from 1976 to 2019. The results from the study revealed that there exists a long-run relationship between money supply (M2) and economic growth in Bangladesh. Akinbobola (2012) investigated the dynamics of money supply, exchange rate and inflation in Nigeria. Using Vector Error Correction Mechanism (VECM), the empirical results confirmed that in the long run, money supply and exchange rate have significant inverse effects on inflationary pressure, while real output growth and foreign price changes have direct effects on inflationary pressure. The study concluded that there exists a causal linkage between inflation, money supply and exchange rate in Nigeria. Islam *et al.* (2023) investigated the impact of gross domestic product on the Bangladesh stock market. The study found a significant and positive relationship between Bangladesh Stock Market index and GDP rate. Other two selected independent variables i.e., Inflation rate and industrial production index have positive relation but not statistically and significant association with the Bangladesh stock market returns. He (2017) examined the relationship between money supply and macroeconomic variables in China from 2000 to 2016. The study found that there is positive relationship between real GDP and inflation with money supply in China. The study also revealed that there is negative relationship between interest rate and money supply. The result of the study indicated that an increase in the real GDP can result in an increase in the money supply, increase in the inflation rate can lead to an increase in the money and also an increase in the interest rate can cause a decrease in the money supply. Dingela and Khobai (2017) examined the impact of money supply on economic growth in South Africa. The study used the autoregressive distributed lag (ARDL) bounds testing approach to cointegration and error correction model to investigate the impact of M3 on GDP per capita. The study revealed that there is statistically significant positive relationship between money supply and economic growth both in short run and long run. The study concluded that money supply is a good vehicle to convey the economy of South African into the right direction.

Stylianou *et al.* (2024) examined the relationship between money supply and inflation in Pakistan. The study employed the Autoregressive Distributed Lag (ARDL) bounds testing approach is employed, which is suitable for analyzing integration among variables with mixed integration orders. The results revealed both short and long-run co-integration between inflation, money supply, unemployment, and interest rates. Notably, unemployment demonstrates a negative correlation with inflation, while money supply and interest rates exhibit a positive relationship. Babtunde and Shaibu (2011) examined the relationship between money supply, inflation economy growth in Nigeria. Using error correction mechanism and the bounds testing approach to co-integration within an autoregressive distributed lag framework, the study revealed that there is a positive relationship between money supply, capital formation, and economic growth in Nigeria while there is a negative relationship between inflation and growth. Maune *et al.* (2020) determined the relationship between money supply and inflation in Zimbabwe during the period 1980 to 2019. The study showed that inflation was directly related to money supply and inversely related to exchange rates and fiscal deficits in Zimbabwe for the period under study. The study concluded that the growth of money supply should be made to match real economic growth as this was the basis of Milton Friedman's monetary rule that holds inflation as a purely a monetary phenomenon that can be produced by expanding the money supply at a faster rate than the growth of capacity output.

Osakwe *et al.* (2021) investigated the impact of monetary policy instruments on deposit money banks' performance in Nigeria from 2000 to 2020, using total private sector credit as a proxy for bank performance and monetary policy rate, liquidity ratio, cash reserve ratio, and loan to deposit ratio as proxies for monetary policy. The findings revealed the significant relationships between total

private sector credit and monetary policy rate, liquidity ratio, and cash reserve ratio, while loan to deposit ratio shows an insignificant relationship. Adediyiyan (2020) examined the determinants of money supply in Nigeria. The study concluded that cash reserve ratio (CRR) is a crucial determinant of the money supply in Nigeria. The study also suggested that other factors like high-powered money, interest rates, and currency ratios also have impact on money supply. Orji *et al.* (2022) examined how the cash reserve ratio (CRR) influences credit to micro-, small, and medium-sized enterprises (MSMEs) through various channels of transmission. The study showed that changes in the cash reserve ratio (CRR) impact credit to MSMEs through liquidity ratios and lending interest rates. A higher liquidity ratio positively affects MSME credit, while increased lending interest rates have a negative effect. Therefore, adjustments in CRR influence credit availability for MSMEs by altering liquidity conditions and borrowing costs. This relationship highlights the interconnectedness between CRR adjustments, credit dynamics, and overall money supply in the economy. Ihsan and Anjum (2013) described the main role of money supply (M2) on the GDP of Pakistan. The study revealed significant impact of money supply (M2) on the GDP of Pakistan whereby the country has seen inflation rate in double digits. The study also suggested that the money supply needs aggressive control to boost the economy. Zapodeanu and Cociuba (2010) investigated the link between money supply with the gross domestic product in Romania. Augmented Dickey-Fuller tests revealed that both M3 and GDP series are non-stationary. Subsequently, co-integration analysis was conducted using the Engle-Granger method. The study revealed a significant relationship between the two variables. The study also concluded that the vector autoregressive model in its differenced form (DVAR) serves as the most suitable model for explicating the linkage between M3 and GDP in Romania. Aslam (2016) examined the impact of money supply on Sri Lankan economy. The study found that money supply is positively and significantly related to gross domestic product of Sri Lanka.

In the context of Nepal, Adhikari (2020) showed that monetary variables do not play an overwhelming role in determining Nepal's balance of payments. The significant relationships were found among money supply, real GDP, inflation and balance of payments, which reflected a strong negative relationship, while reflected a strongly positive relationship among interest rate and net domestic assets and balance of payments. Nyaupane (2023) investigated the theory of money demand of Nepal. Using Bound test and Auto-regressive Distributive lag model (ARDL), the empirical result indicated the existence of both short-run and long-run relationships between money demand and real gross domestic production. Furthermore, money demand has a good short-run association with inflation and the consumer price index, whereas it has a long-run relationship. The study concluded an association between broad money supply and real gross domestic production in Nepal exists. Rana (2020) examined the effect of inflation and money supply on output growth in Nepal. The study, using ARDL Bound Test, revealed that inflation and money supply are cointegrated with economic growth over the study period. Similarly, the study also found that money supply in Nepal leads to output growth in the long-run as well as short-run. However, inflation negatively affects output growth both in the long-run and short-run. The study concluded that money supply in Nepal can stimulate output growth, whereas inflation can be detrimental to economic growth.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of macroeconomic variables on money supply. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The main purpose of the study is to analyze the impact of macroeconomic variables on money supply in Nepalese economy. Specifically, it examines the relationship of inflation, gross domestic

product, cash reserve ratio, import, export, and exchange rate on money supply and money supply to gross domestic product ratio in the context of Nepalese economy.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results and the final sections draws conclusion.

2. Methodological aspects

The study is based on the secondary data for the study period from 2000/01 to 2022/23. The main sources of data include Bank supervision report, Economic Survey published by Ministry of Finance and reports published by World Bank. The study has employed 23 years of time series data from 2000/01 to 2022/23. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of macro-economic variables selected for the study along with the study period and number of observations.

Table 1

List of macroeconomic variables selected for the study along with the study period and number of observations

S. N.	Variables	Study period	Number of observations
1	Money supply	2000/01-2022/23	23
2	Money supply/GDP ratio	2000/01-2022/23	23
3	Inflation	2000/01-2022/23	23
4	Gross domestic product	2000/01-2022/23	23
5	Cash reserve ratio	2000/01-2022/23	21
6	Balance of Payment-Export	2000/01-2022/23	23
7	Balance of Payment- Import	2000/01-2022/23	23
8	Exchange rate	2000/01-2022/23	23

The model

The model used in this study assumes that money supply depends on various macroeconomic variables. The dependent variables selected for the study are money supply and money supply to gross domestic product ratio. Similarly, the selected independent variables in this study are inflation, gross domestic product, cash reserve ratio, import, export, and exchange rate. Therefore, the models take the following forms:

$$MS = \beta_0 + \beta_1 \text{ GDP} + \beta_2 \text{ INF} + \beta_3 \text{ CRR} + \beta_4 \text{ BOP-M} + \beta_5 \text{ BOP-X} + \beta_6 \text{ ER} + e_{it}$$

$$MS/GDP = \beta_0 + \beta_1 \text{ GDP} + \beta_2 \text{ INF} + \beta_3 \text{ CRR} + \beta_4 \text{ BOP-M} + \beta_5 \text{ BOP-X} + \beta_6 \text{ ER} + e_{it}$$

Where,

MS = Money supply as measured by the broad money supply, Rs. in billion.

MS/GDP = Money supply to GDP ratio as measured by the ratio of money supply to GDP, in times.

INF = Inflation as measured by the change in the consumer price index, in percentage),

GDP = Gross domestic product of the country, Rs. in billion.

CRR = Cash reserve ratio as measured by the reserves kept in central bank against the bank's total

deposits, in percentage).

BOP-M = Balance of payment of import as measured by total import by nation, Rs. in billion).

BOP-X = Balance of payment of export as measured by total export by nation, Rs. in billion).

ER = Exchange rate as measured by the real exchange rate between Nepalese Rupees against USD).

The following section describes the independent variables used in this study along with hypothesis formulation.

Gross domestic product

Central banks play a crucial role in managing the money supply to foster sustainable economic growth while avoiding the pitfalls of excessive inflation or deflation. Aslam (2016) examined the impact of money supply on Sri Lankan economy. The study found that money supply is positively related to gross domestic product of Sri Lanka. Similarly, Ifionu and Akinpelumi (2015) stated that gross domestic product has a positive impact on money supply. The economic growth rate of a country is a significant macroeconomic variable that has a notable impact on the money supply (Dingela and Khobai, 2017). Further, Ihsan and Anjum (2013) found that money supply is positively associated with GDP growth. The study concluded that money supply needs aggressive control to boost the economy. Moreover, Marshal (2016) found that money supply (proxy by M2) has a positive and significant linkage with real gross domestic product in Nigeria. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between gross domestic product and money supply.

Balance of payment-Import

The availability of imported goods and services can enhance domestic productivity by providing access to better technology, machinery, and inputs. This can lead to higher productivity and economic growth, potentially increasing the effective money supply as the economy expands. Mutana *et al.* (2018) reported that GDP, terms of trade, trade liberalization, money supply and FDI have significant and positive long-run relationship with trade balance. Countries with a high level of imports often attract foreign direct investment (FDI) and portfolio investment. Investors may be drawn to the market size and growth potential indicated by high import levels. These capital inflows can increase the money supply as foreign investors convert their currency into the domestic currency to invest, boosting domestic liquidity. Bahmani-Oskooee and Chomsisengphet (2002) stated that they found evidence of a positive relationship between money supply and imports in Thailand. Further, Roy and Rayhan (2011) stated that Bangladesh's trade flows are significantly and positively determined by the size of Bangladesh's economy and its partners and money supply. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between import and money supply.

Balance of Payment-Export

Increased exports can lead to higher national income and economic growth. As exporters receive more revenue, this income can circulate through the economy, potentially increasing the money supply indirectly. There exists a positive relationship between money supply and exports (Broll and Eckwert, 1999). Astuti *et al.* (2015) found that export has a positive effect on the economic growth and money supply of the country. When exports increase, central banks accumulate more foreign exchange reserves. To manage these reserves, central banks might purchase domestic assets or inject liquidity into

the banking system, effectively increasing the money supply. In addition, Huchet-Bourdon and Korinek (2011) found that there exists positive relationship between money supply and export. Higher exports generate more foreign exchange earnings. This can lead to an increase in foreign reserves held by the central bank, which can influence the money supply. Additionally, Alper (2017) showed that there is a significant positive relationship of money supply with the exports of high-technology, medium-technology, final and intermediate goods. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between export and money supply.

Exchange rate

Stungwa *et al.* (2018) stated that there exists positive relationship between exchange rate and money supply. Higher demand for foreign currencies relative to the domestic currency leads to the depreciation of the domestic currency. Thus, an increase in money supply is associated with a lower value of the domestic currency in the foreign exchange market. Likewise, Mpofu (2011) found that money supply and exchange rates have a strong positive relationship. Cornell (1982) found that announcement of an unexpected jump in the money supply is accompanied by an increase in interest rates and an appreciation of the dollar. Moreover, Megaravalli and Sampagnaro (2018) found that exchange rate has a positive and significant relationship in long-run with money supply. When the money supply increases, it can lead to a depreciation of the domestic currency, and this change in exchange rates can have broader economic implications. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between exchange rate and money supply.

Inflation

Inflation and the money supply are intricately linked, with changes in one often influencing the other. Central banks play a crucial role in managing this relationship to maintain economic stability. By adjusting the money supply and interest rates, they aim to control inflation, ensure stable prices, and support sustainable economic growth. Su *et al.* (2016) examined the causal relationship between money supply growth and inflation in China. The study showed that money supply is the main cause of inflation while any increase in interest rate is responsible for reducing inflationary pressure in China. Likewise, Gatawa *et al.* (2017) showed that a long-run positive relationship between money supply and inflation in the context of Nigeria. Furthermore, Stylianou *et al.* (2024) found that, in Pakistan, there exists a positive correlation between inflation and the money supply. Moreover, Kiganda (2014) stated that money supply and exchange rate have significant positive impact on inflation in the context of Kenya. Further, the study indicated that the current inflation can be influenced by the past state inflation. Inflation has a positive and significant relationship with money supply (Denbel *et al.*, 2016). The determination of interest rates, which is influenced by the monetary policy decisions of the central bank, is a significant factor in shaping the dynamics of the money supply (Amassoma *et al.*, 2018). Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between the inflation and money supply.

Cash reserve ratio

The cash reserve ratio is a critical tool used by central banks to control the money supply. There is a clear negative relationship between the CRR and the money supply: increasing the CRR reduces the money supply, while decreasing the CRR increases the money supply (Adhiambo *et al.*, 2021). This requirement ensures that banks have enough liquidity to meet customer withdrawals and maintain

stability in the financial system. Adediyi (2020) stated that the reserve ratio is negatively related to the level of the money stock and significant at five percent in the long run. When the central bank increases the CRR, banks are required to hold a higher proportion of their deposits as reserves. This reduces the amount of money that banks can lend out. Conversely, when the CRR is lowered, banks can hold a smaller proportion of their deposits as reserves, thereby increasing the amount of money available for lending. Babalola and Ogirima (2019) concluded that in the short term, cash reserve ratio has the negative impact on money supply. The negative relationship between the cash reserve ratio (CRR) and the money supply is rooted in how the banking system operates and the central bank's role in regulating liquidity and ensuring financial stability. Based on it, this study develops the following hypothesis:

H_0 : There is a negative relationship between cash reserve ratio and money supply.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2000/01 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of Nepalese economy for the study period from 2000/01 to 2022/23. The dependent variables are MS (Money supply as measured by the broad money supply, Rs. in billion), and MS/GDP (Money supply to GDP ratio as measured by the ratio of money supply to GDP, in times). The independent variables are INF (Inflation as measured by the change in the consumer price index, in percentage), GDP (Gross Domestic Product of the country, Rs. in billion), CRR (Cash reserve ratio as measured by the reserves kept in central bank against the bank's total deposits, in percentage), BOP-M (Balance of payment of import as measured by total import by nation, Rs. in billion), BOP-X (Balance of payment of export as measured by total export by nation, Rs. in billion), ER (Exchange rate as measured by the real exchange rate between Nepalese Rupees against USD).

Variables	Minimum	Maximum	Mean	Std. Deviation
MS	214.45	6130.48	1882.46	1868.11
MS/GDP	0.20	2.38	0.91	0.70
GDP	489.00	2576.25	1662.99	528.22
INF	2.44	12.62	6.36	2.68
CRR	3.00	6.00	4.92	1.04
ER	65.21	130.60	90.72	20.04
BOP-M	46.94	1920.45	676.18	569.18
BOP-X	53.91	200.30	94.80	41.71

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of Nepalese economy for the study period from 2000/01 to 2022/23. The dependent variables are MS (Money supply as measured by the broad money supply, Rs. in billion), and MS/GDP (Money supply to GDP ratio as measured by the ratio of money supply to GDP, in times).

The independent variables are INF (Inflation as measured by the change in the consumer price index, in percentage), GDP (Gross Domestic Product of the country, Rs. in billion), CRR (Cash reserve ratio as measured by the reserves kept in central bank against the bank's total deposits, in percentage), BOP-M (Balance of payment of import as measured by total import by nation, Rs. in billion), BOP-X (Balance of payment of export as measured by total export by nation, Rs. in billion), ER (Exchange rate as measured by the real exchange rate between Nepalese Rupees against USD).

Variables	MS	MS/GDP	GDP	INF	ER	BOP-M	BOP-X	CRR
MS	1							
MS/GDP	0.992**	1						
GDP	0.852**	0.893**	1					
INF	0.002	0.071	0.239	1				
ER	0.767**	0.810**	0.948**	0.159	1			
BOP-M	0.970**	0.977**	0.892**	0.062	0.779**	1		
BOP-X	0.669**	0.636**	0.562**	-0.224	0.630**	0.569**	1	
CRR	-0.386	-0.300	0.083	0.488*	0.149	-0.298	-0.356	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that there exists positive relationship between gross domestic product and money supply. It indicates that higher the gross domestic product, higher would be the money supply. Similarly, inflation has a positive relationship with money supply suggesting that increase in inflation rate leads to increase in money supply. However, there is a significant positive correlation between money supply and exchange rate. It implies that increase in exchange rate with US Dollar leads to increase in money supply. Likewise, imports (BOP-M) also have a positive relationship with money supply indicating that increase in imports leads to increase in money supply. Moreover, exports (BOP-X) have a positive correlation with money supply, indicating higher export results in higher money supply. However, cash reserve ratio (CRR) exhibits a negative correlation with money supply. It implies that higher reserve requirements are associated with a lower money supply.

Similarly, there exists positive relationship between gross domestic product and money supply to GDP ratio. It indicates that higher the gross domestic product, higher would be the money supply to GDP ratio. Similarly, inflation has a positive relationship with money supply to GDP ratio suggesting that increase in inflation rate leads to increase in money supply to GDP ratio. However, there is a significant positive correlation between money supply to GDP ratio and exchange rate. It implies that increase in exchange rate with US Dollar leads to increase in money supply to GDP ratio. Likewise, imports (BOP-M) also have a positive relationship with money supply to GDP ratio indicating that increase in imports leads to increase in money supply to GDP ratio. Moreover, exports (BOP-X) have a positive correlation with money supply to GDP ratio, indicating higher export results in higher money supply to GDP ratio. However, cash reserve ratio (CRR) exhibits a negative correlation with money supply to GDP ratio. It implies that higher reserve requirements are associated with a lower money supply to GDP ratio.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and the results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of inflation, gross domestic product, cash reserve ratio, import, export, and exchange rate on money supply.

Table 4

Estimated regression results of inflation, gross domestic product, cash reserve ratio, import, export, and exchange rate on money supply

The results are based on time series data for the period from 2000/01 to 2022/23 by using the linear regression model and the model is $MS = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 CRR + \beta_4 BOP-M + \beta_5 BOP-X + \beta_6 ER + e_t$ where, the dependent variable is MS (Money supply as measured by the broad money supply, Rs. in billion). The independent variables are INF (Inflation as measured by the change in the consumer price index, in percentage), GDP (Gross Domestic Product of the country, Rs. in billion), CRR (Cash reserve ratio as measured by the reserves kept in central bank against the bank's total deposits, in percentage), BOP-M (Balance of payment of import as measured by total import by nation, Rs. in billion), BOP-X (Balance of payment of export as measured by total export by nation, Rs. in billion), ER (Exchange rate as measured by the real exchange rate between Nepalese Rupees against USD).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		INF	GDP	CRR	BOP-M	BOP-X	ER			
1	1871.58 (1.985)	1.471 (0.01)						0.048	1912.0	0.001
2	4398.64 (10.65)**		3.669 (15.80)**					0.919	532.52	249.721
3	6619.88 (3.698)**			-929.03 (2.61)**				0.225	1654.9	6.821
4	6619.88 (3.698)**				3.185 (18.401)**			0.939	462.09	338.521
5	6619.88 (3.698)**					30.969 (4.386)**		0.453	138.27	19.241
6	6160.60 (10.6)**						88.657 (14.160)**	0.901	588.88	200.354
7	3948.05 (9.21)**	15.86 (0.421)	3.669 (15.80)**					0.932	487.94	151.257
8	2668.23 (3.946)**	15.86 (0.421)	3.611 (17.68)**	-321.38 (3.22)**				0.956	395.57	154.978
9	-2330.69 (1.607)	13.531 (0.341)	3.241 (-2.296)*	-308.14 (2.70)**	0.323 (0.265)			0.953	406.85	102.814
10	-5307.61 (3.656)**	10.767 (0.345)	4.624 (3.902)**	-162.88 (1.633)	1.252 (1.170)**	10.208 (3.307)**		0.971	319.57	135.404
11	-5152.53 (3.414)**	5.57 (0.168)	4.053 (2.593)**	-166.158 (1.626)	1.011 (0.861)	9.442 (2.757)**	7.982 (0.578)	0.970	326.91	107.975

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Money supply is the dependent variable.

Table 4 shows that the beta coefficients for gross domestic products are positive with money supply. It indicates that gross domestic products have a positive impact on money supply. This finding is similar to the findings of Ifionu and Akinpelumi (2015). Similarly, the beta coefficients for inflation are positive with money supply. It indicates that inflation has a positive impact on money supply. This finding is consistent with the findings of Su *et al.* (2016). Likewise, the beta coefficients for export are positive with money supply. It indicates that export has a positive impact on money supply. This finding is similar to the findings of Astuti *et al.* (2015). Furthermore, the beta coefficients for import are positive with money supply. It indicates that import has a positive impact on money supply. This finding is consistent with the findings of Bahmani-Oskooee and Chomsisengphet (2002). Similarly, the beta coefficients for exchange rate are positive with money supply. It indicates that exchange rate has a positive impact on money supply. This finding is consistent with the findings of Stungwa *et al.* (2018). Similarly, the beta coefficients for cash reserve ratio are negative with money supply. It indicates that cash reserve ratio has a negative impact on money supply. This finding is similar to the findings of Adediyani (2020).

Table 5 shows the regression results of inflation, gross domestic product, cash reserve ratio,

import, export, and exchange rate on money supply to gross domestic product ratio.

Table 5

Estimated regression results of inflation, gross domestic product, cash reserve ratio, import, export, and exchange rate on money supply to GDP ratio

The results are based on time series data for the period from 2000/01 to 2022/23 by using the linear regression model and the model is $MS/GDP = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 CRR + \beta_4 BOP-M + \beta_5 BOP-X + \beta_6 ER + e_t$ where, the dependent variable is MS/GDP (Money supply to GDP ratio as measured by the ratio of money supply to GDP, in times). The independent variables are INF (Inflation as measured by the change in the consumer price index, in percentage), GDP (Gross Domestic Product of the country, Rs. in billion), CRR (Cash reserve ratio as measured by the reserves kept in central bank against the bank's total deposits, in percentage), BOP-M (Balance of payment of import as measured by total import by nation, Rs. in billion), BOP-X (Balance of payment of export as measured by total export by nation, Rs. in billion), ER (Exchange rate as measured by the real exchange rate between Nepalese Rupees against USD).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		INF	GDP	CRR	BOP-M	BOP-X	ER			
1	0.814 (2.053)* 1515	0.019 (1.632)						0.044	0.723	0.069
2	(12.95)** 2.504 (3.598)**		0.001 (21.53)**					0.955	0.150	463.7
3				-0.310 (2.239)*				0.167	0.643	5.012
4	0.088 (1.736) -0.125 (-0.428) 2.179 (11.39)**				0.001 (20.91)**			0.952	0.1552	437.2
5						0.011 (3.850)**		0.386	0.5551	14.82
6							0.034 (16.53)**	0.925	0.1937	273.025
7	1.417 (11.11)**	0.019 (1.632)	0.001 (22.39)**					0.958	0.145	251.5
8	1.142 (5.280)**	0.001 (0.032)	0.001 (21.62)**	-0.079 (2.464)*				0.968	0.126	201.2
9	1.294 (2.796)**	0.001 (0.032)	0.002 (3.504)**	-0.034 (1.153)	0.000 (0.374)			0.966	0.1298	143.3
10	2.323 (5.355)**	0.001 (0.059)	-0.02 (5.81)**	-0.034 (1.153)	0.000 (0.374)	0.003 (3.101)**		0.982	0.954	215.1
11	2.222 (5.161)**	0.004 (0.413)	0.002 (3.784)**	-0.036 (1.251)	-0.001 (1.59)	0.003 (3.101)**	0.005 (1.312)	0.983	0.932	188.2

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Money supply to GDP ratio is the dependent variable.

Table 5 shows that the beta coefficients for gross domestic products are positive with money supply to GDP ratio. It indicates that gross domestic products have a positive impact on money supply to GDP ratio. This finding is similar to the findings of Marshal (2016). Similarly, the beta coefficients for inflation are positive with money supply to GDP ratio. It indicates that inflation has a positive impact on money supply to GDP ratio. This finding is consistent with the findings of Gatawa *et al.* (2017). Likewise, the beta coefficients for export are positive with money supply to GDP ratio. It indicates that export has a positive impact on money supply to GDP ratio. This finding is similar to the findings of Huchet-Bourdon and Korinek (2011). Furthermore, the beta coefficients for import are positive with money supply to GDP ratio. It indicates that import has a positive impact on money supply to GDP ratio. This finding is consistent with the findings of Roy and Rayhan (2011). Similarly, the beta coefficients for exchange rate are positive with money supply to GDP ratio. It indicates that exchange rate has a positive impact on money supply to GDP ratio. This finding is consistent with the findings of Mpofu (2011). Similarly, the beta coefficients for cash reserve ratio are negative with money

supply to GDP ratio. It indicates that cash reserve ratio has a negative impact on money supply to GDP ratio. This finding is similar to the findings of Babalola and Ogirima (2019).

4. Summary and conclusion

Adequate money supply growth is essential for supporting economic growth. It ensures that businesses and consumers have enough liquidity to fund investments and consumption, driving economic activity. Money supply is a critical component of a nation's economic framework. It affects inflation, interest rates, economic growth, and overall financial stability. Central banks play a pivotal role in managing the money supply to ensure a stable and prosperous economy.

This study attempts to analyze the effect of macroeconomic variables on money supply in Nepalese economy. The study is based on secondary data for the study period from 2000/01 to 2022/23.

The major conclusion of this study is that inflation, gross domestic product, import, export and exchange rate have positive impact on money supply. The money supply is intricately linked with various economic indicators, reflecting its central role in maintaining a healthy economy. Positive impacts on the money supply from inflation, GDP, imports, exports, and exchange rates highlight the multifaceted nature of monetary policy and its far-reaching effects. Economic growth, measured by GDP, requires a corresponding expansion in the money supply to facilitate higher levels of production and consumption. As GDP rises, so does the demand for money to support business activities and consumer spending. Moderate inflation can stimulate economic activity by encouraging spending and investment. This, in turn, necessitates an adequate money supply to support increased transactional needs. The study also concluded that import followed by gross domestic product, exchange rate, export and cash reserve ratio is the most influencing factor that explain money supply of Nepalese economy.

References

- Adediyin, A. R., 2020. Determinants of money supply in Nigeria. *CBN Journal of Applied Statistics* 11(2), 181-199.
- Adhiambo, O. R., C. J. Wafula, and N. Christopher, 2021. Relationship between cash reserve ratio and access to credit by micro, small and medium enterprises in Kisumu County, Kenya. *World Journal of Innovative Research* 10(2), 45-56.
- Adhikari, U. R., 2020. An empirical analysis of balance of payment in Nepal using the monetary approach. *International Journal of Science Academic Research* 1(6), 277-283.
- Akinbobola, T. O., 2012. The dynamics of money supply, exchange rate and inflation in Nigeria. *Journal of Applied Finance and Banking* 2(4), 117-124.
- Alper, C. E., 2017. Money supply and exports: Evidence from advanced and emerging economies. *Economic Modelling* 64(1), 153-171.
- Amassoma, D., K. Sunday, and E. E. Onyedikachi, 2018. The influence of money supply on inflation in Nigeria. *Journal of Economics and Management* 31(1), 5-23.
- Anjum, M., I. Ahmed, S. A. Seikdear, and M. M. Hasan, 2020. The nexus between money supply and economic growth in Bangladesh: An ARDL Approach. *Journal of Economics* 4(1), 134-148.
- Aslam, A. L. M., 2016. Impact of money supply on Sri Lankan economy: An econometric analysis. *International Letters of Social and Humanistic Sciences* 67(1), 11-17.
- Astuti, E., R. Hidayat, and I. P. Sari, 2015. The impact of exports on economic growth and money supply: Evidence from a cross-country analysis. *International Journal of Economics and Finance* 7(10), 123-136.

- Babalola, A., and A. Ogirima, 2019. Monetary policy and money supply in Nigeria: A comparative analysis: 1993-2018. *Public Policy and Administration Research* 9(3), 90-99.
- Babatunde, H. O., M. T. Shaibu, and O. O. Ariyo, 2019. Money politics in Nigeria's fourth republic: implications for electoral process and democratic consolidation. *Journal of Research in Humanities and Social Science* 7(4), 34-42.
- Bahmani-Oskooee, M., and S. Chomsisengphet, 2002. Stability of M2 money demand function in Thailand. *Applied Economics Letters* 9(15), 1001-1004.
- Broll, U., and B. Eckwert, 1999. Exports and indirect hedging of foreign currency risk. *The Japanese Economic Review* 50(3), 356-362.
- Cornell, B., 1982. Money supply announcements, interest rates, and foreign exchange. *Journal of International Money and Finance* 1(1), 201-208.
- Denbel, F. S., Y. W. Ayen, and T. A. Regasa, 2016. The relationship between inflation, money supply and economic growth in Ethiopia: Co integration and Causality Analysis. *International Journal of Scientific and Research Publications* 6(1), 556-565.
- Dingela, S., and H. Khobai, 2017. Dynamic impact of money supply on economic growth in South Africa. An ARDL approach. *Journal of Business and Economic Development* 2(4), 2-18.
- Gatawa, N. M., A. Abdulgafar, and M. O. Olarinde, 2017. Impact of money supply and inflation on economic growth in Nigeria (1973-2013). *IOSR Journal of Economics and Finance* 8(3), 26-37.
- He, Y., 2017. A study on the relationship between money supply and macroeconomic variables in China. *Mediterranean Journal of Social Sciences* 8(6), 99-107.
- Huchet-Bourdon, M., and J. Korinek, 2011. To what extent do exchange rates and their volatility affect trade? *OECD Trade Policy Working Papers No. 119*.
- Ifionu, E., and O. F. Akinpelumi, 2015. Macroeconomic variables and money supply: Evidence from Nigeria. *African Research Review* 9(4), 288-307.
- Ihsan, I., and S. Anjum, 2013. Impact of money supply (M2) on GDP of Pakistan. *Global Journal of Management and Business Research Finance* 13(6), 1-8.
- Islam, M. S., R. Parvin, M. Milon, and M. K. Das, 2023. The impact of gross domestic product on the Bangladesh stock market: An empirical analysis. *International Journal of Finance and Accounting* 12(1), 1-12.
- Jhingan, M. L., 2006. *Monetary Economics* (Vrida Publications Ltd, New Delhi).
- Jing-Xin, C., and W. Yuan, 2012. Study on factors affecting money supply based on multiple regression model. *Future Wireless Networks and Information Systems* 2(1), 273-282.
- Kiganda, E. O. 2014. Relationship between inflation and money supply in Kenya. *Journal of Social Economics* 2(2), 63-83.
- Marshal, I., 2017. The impact of macroeconomic dynamic on bank lending behaviour in Nigeria. *Noble International Journal of Economics and Financial Research* 2(10), 131-139.
- Maune, A., E. Matanda, and J. Mundonde, 2020. Is money supply the cause of inflation in Zimbabwe? An empirical examination. *Acta Universitatis Danubius. Œconomica* 16(3), 17-37.
- Megaravalli, A. V., and G. Sampagnaro, 2018. Macroeconomic indicators and their impact on stock markets in ASIAN 3: A pooled mean group approach. *Cogent Economics and Finance* 6(1), 1-14.
- Mpofu, T., 2011. The relationship between money supply and exchange rates: Evidence from empirical analysis. *Journal of Monetary Economics* 46(2), 321-335.

- Mutana, J., C. Winrose, and E. Saina, 2018. Macro-economic determinants of Kenya's trade balance. *International Journal of Research and Innovation in Social Science* 2(10), 49-55.
- Nyaupane, B. R., 2023. The Bound Test Approach of the money demand determinants in Nepal. *Kalika Journal of Multidisciplinary Research* 1(1), 83-95.
- Orji, A., J. E. Ogbuabor, C. E. Ugwu, O. I. Anthony-Orji, and L. C. Nwifo, 2022. Cash reserve ratio and credit to micro-, small and medium-sized enterprises in developing economies. Analysis of transmission channels using Nigerian Data. *Financial Magazine* 14(1), 71-88.
- Osakwe, C. I., N. J. Okoye, G. Ezeala, and L. N. Okeke, 2021. Monetary policy instruments: Effect on the performance of deposit money banks in Nigeria. *Journal of Contemporary Issues in Accounting* 1(1), 74-90.
- Rana, S., 2020. Effect of inflation and money supply on output growth in Nepal. *International Journal of Scientific and Engineering Research* 11(1), 289-296.
- Roy, S., and M. Rayhan, 2014. Determinants of trade flows: Evidence from Bangladesh. *Bangladesh Development Studies* 37(3), 45-61.
- Stungwa, S., N. W. Hlongwane, and H. Khobai, 2023. Modelling the asymmetric effect of macroeconomic variables on South Africa's money supply. *International Journal of Economics and Finance Studies* 15(3), 108-139.
- Stylianou, T., R. Nasir, and M. Waqas, (2024). The relationship between money supply and inflation in Pakistan. *Plos One* 19(3), 12-25.
- Su, C. W., J. J. Fan, H. L. Chang, and X. L. Li, 2016. Is there causal relationship between money supply growth and inflation in China? Evidence from quantity theory of money. *Review of Development Economics* 20(3), 702-719.
- Yunana, T. W., R. J. Chenbap, Y. A. Yunana, and J. E. Akpan, 2014. The effect of money supply on interest rate in Nigeria. *Online Journal of Social Sciences Research* 3(6), 146-152.
- Zapodeanu, D., and M. I. Cociuba, 2010. Linking money supply with the gross domestic product in Romania. *Annales Universitatis Apulensis: Series Oeconomica* 12(1), 501-512.

Chapter 35

Impact of financial development on profitability of Nepalese commercial banks

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Abstract

This study examines the impact of financial development on the profitability of Nepalese commercial banks. Return on assets and return on equity are the selected dependent variables. The selected independent variables are capital adequacy ratio, non-performing loan, operational efficiency ratio (cost to income ratio), inflation, bank concentration and gross domestic product. The study is based on secondary data of 12 Nepalese commercial banks with 108 observations for the study period from 2014/15 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB), annual reports of the selected commercial banks, World Bank and OECD Inflation CPI indicator. The correlation coefficients and regression models are estimated to test the significance and importance of financial development on profitability of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive impact on return on assets and return on equity. It indicates that increase in capital adequacy ratio leads to increase in return on assets and return on equity. In contrast, non-performing loan has a negative impact on return on assets and return on equity. It indicates that higher the non-performing loans, lower would be the return on assets and return on equity. However, operating efficiency ratio has a positive impact on return on assets and return on equity. It indicates that increase in operating efficiency ratio leads to increase in return on assets and return on equity. In contrast, inflation rate has a negative impact on return on assets and return on equity. It indicates that increase in inflation rate leads to decrease in return on assets and return on equity. However, bank concentration ratio has a positive impact on return on assets and return on equity. It indicates that increase in bank concentration ratio leads to increase in return on assets and return on equity. Likewise, gross domestic product has a positive impact on return on assets and return on equity. It indicates that increases in gross domestic product leads to increase in return on assets and return on equity.

Keywords: capital adequacy ratio, non-performing loan, operational efficiency ratio (cost to income ratio), inflation, bank concentration, gross domestic product, return on assets, return on equity

1. Introduction

Banks are financial intermediaries that deals in money and derivatives which offers different financial services. Banks provide an effective system for gathering and allocating resources from less important activities to more profitable investments. Financial institutions play a crucial role in promoting economic growth and development by facilitating deposit mobilization, money transfer, settlement, and lending to businesses and families (Guiso *et al.*, 2004). Commercial banks are functioning globally as agents of development and making significant contributions to the economic growth and advancement of nations. This is the reason why the banking industry is considered the main catalyst of an economy (Swandewi and Purnawati, 2021). Through the assessment of profitability performance, it is thus possible to assess how efficiently and well a bank has managed its resources over a particular time horizon (Ngurah and Panji, 2021). A bank's robust profitability indicates a greater ability to generate profit and make a substantial effect on the economic growth of a nation (Adiatmayani and Panji, 2021). The position of financial development also plays an important role in enhancing the effectiveness of the financial system framework in a country. In financially developed economies, high levels of financial development promote the smooth working of payment systems, financial intermediation processes, and settlement systems through bettered market efficiency. On the other hand, low position of financial development is arguably one of the main reasons why the banking sectors of most developing countries incur high costs, have high market inefficiencies, and perform unsatisfactorily (Nourzad, 2002). As a result, it is not surprising that bank regulators in emerging economies, in addition to regulating bank

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capital and liquidity, frequently focus on the financial sector's growth and success.

The banking industry is the most crucial part of the financial system (Gersl and Hermanek, 2008). It plays a critical role in economic growth at firm, industry and macroeconomic levels (Mittal and Garg, 2021). Banks are financial institutions that play intermediary role in the economy through channeling financial resources from surplus economic units to deficit economic units. In turn, they facilitate the saving and capital formation in the economy. Banking system plays an important role in the development of a country's economy and its financial stability (Ryu *et al.*, 2012). Banks have a very important function to play in the economic operations of any country as financial intermediary. The task of providing funds to the economy makes their performance an important objective of any country. Banks are vital to economic growth because the overall financial systems of most economies in the world are influenced by the banking system (Ali and Anbar, 2011). As financial intermediaries, bank plays a crucial role in the operation of the economy. Banks insolvencies can result in systematic crisis. Failure of individual banks adversely affects the economy and the society at large (Kolapo *et al.*, 2012).

Bashiru *et al.* (2023) assessed the impact of financial development on bank profitability in the Sub-Saharan African countries. The study revealed that financial development has a negative influence on the profitability of the banking sector. The study also showed that the quality of institutions and the stability of banks significantly and positively affect profitability of commercial banks. Likewise, Ozili (2019) analyzed the non-performing loans and financial development: New evidence. The findings of the study indicated that financial development, measured as foreign bank presence and financial intermediation, are positively associated with non-performing loan. Also, bank efficiency, loan loss coverage ratio, competition and banking system stability are inversely associated with non-performing loan, while non-performing loan are positively associated with banking crises and bank concentration. In the regional analysis, non-performing loan are negatively associated with regulatory capital and bank liquidity, implying that banking sectors with greater regulatory capital and liquidity experience fewer non-performing loan.

Tan and Floros (2012) analyzed the bank profitability and inflation: The case of China. The study found that there is a strong and positive relationship between cost efficiency, banking sector development, stock market development, inflation and bank profitability. Similarly, Priharto and Gani (2024) investigated the determinant of bank profitability involved Bank BUMN (State-Owned Enterprises). The findings of the study showed that capital adequacy ratio has a positive impact on profitability of banks. Further, Lim *et al.* (2023) assessed the impact of capital adequacy ratio on the profitability of ASEAN-5 banks. The result showed that capital adequacy ratio is positively significant to the return on equity of the banks but have partially significant affect to the return of assets of the banks. Moreover, Murtiningsih and Tohirin (2023) analyzed the influence of some bank financial ratios characteristics on profitability in sharia bank. The findings of the study showed that capital adequacy ratio, financing to deposit ratio, non-performing financing, operating expense to operating income ratio and demand deposits have an immediate influence on the profitability of Islamic Commercial Banks (BUS) particularly on return on assets and return on equity. In addition, Jigeer and Koroleva (2023) investigated how external and internal factors impact the profits of city banks, in China during the years 2008, to 2020 focusing on a set of 16 banks. Based on the result of the study, the capital adequacy ratio has a positive impact on return on assets but a negative impact on return on equity means that as increased in capital adequacy ratio tend to increased return on asset and decreased return on equity of the banks of China.

Karim *et al.* (2022) examined the relationship between non-performing loans and bank profitability in Bangladesh. The study revealed that non-performing loan has a negative impact on profitability as indicated by the return on assets. Similarly, Saleh and Winarso (2021) assessed the non-performing loans and loan to deposit ratio towards profitability. The findings of the study demonstrated

that non-performing loan has a negative impact on return on assets. Likewise, Alshebmi *et al.* (2020) investigated the relationship between non-performing loans and a few chosen bank determinants (internal factors) and macroeconomic determinants (external factors) in Saudi banking sector. The correlation analysis revealed a weak and adverse relationship between non-performing loans, credit risk, bank liquidity risk, gross domestic product growth and return on assets. Further, Jing (2020) assessed the impact of high non-performing loan ratios on bank lending trends and profitability. The study revealed that non-performing loans have adverse influence on bank profitability.

Al-Sharkas and Al-Sharkas (2022) investigated the impact on bank profitability: Testing for capital adequacy ratio, cost-income ratio and non-performing loans in emerging markets. The study revealed that there is an adverse relationship between non-performing loan ratio and the cost-income ratio with bank profitability measured by return on assets and return on equity. Likewise, Khalifaturafi'ah (2018) assessed the cost efficiency, total assets, and profitability: Evidence from Islamic bank. The study indicated that cost efficiency does not directly impact the profitability of banks. Further, Buchory (2015) examined how credit risk and operational efficiency influence the profitability of banks. The study found that non-performing loans have a positive and significant impact on return on assets whereas the operating expense to operating income ratio has a negative and significant impact on return on assets. Al Arif and Awwaliyah (2019) investigated how the market structure impacts the profitability of the banking sector in Indonesia after the implementation of the Islamic Banking Act came into effect. The study concluded that the concentration ratio of banks does not significantly affect the profitability of banks. Similarly, Abdelmoneim and Yasser (2023) examined the impact of bank performance and economic growth on bank profitability in eight middle income countries across the Middle East and North Africa region and MINT countries. The study showed that GDP growth rate have significant and positive relationship with profitability of banks. Likewise, Islam (2023) assessed how macroeconomic variables influenced the profitability of commercial banks listed on the London Stock Exchange (LSE) from 2015 to 2019. The study revealed that GDP growth rate has a negative impact on return on equity and return on assets.

Kingu *et al.* (2018) examined the impact of non-performing loans on bank's performance. The study revealed that occurrence of non-performing loan is negatively associated with the level of performance in commercial banks in Tanzania. Similarly, Silaban (2017) assessed the effect of capital adequacy ratio, net interest margin and non-performing loans on financial performance in Indonesia. The study concluded that capital adequacy ratio (CAR) does not have a significant effect on financial performance and non-performing loans (NPL) has a negative impacts on financial performance. Likewise, Anggari and Dana (2020) examined the effect of non-performing loans (NPL) and capital adequacy ratio (CAR) on performance measured by return on assets (ROA) at PT. Bank Central Asia (BCA), TBK. The study found that non-performing loans do not affect the return on assets. However, capital adequacy ratio has a significant impact on return on asset. Similarly, Martiningtiyas and Nitinegeri (2020) assessed the effect of non-performing loans on the performance of banking sector in Indonesia. The study revealed that non-performing loan has a significant and negative influence on performance of bank. Similarly, liquidity ratio and gross domestic product have significant positive influence on performance of bank whereas capital adequacy ratio does not have significant influence on performance of bank. In addition, Djaya and Yanuarti (2021) examined the influence of capital adequacy ratio and non-performing loan on the performance of commercial banks listed on Indonesia stock exchange. The results stated that the capital adequacy ratio and non-performing loan simultaneously affect the performance.

In the context of Nepal, Mishra and Kandel (2023) examined the specific factors of the form affecting profitability of Commercial Banks: A Case from Nepal. The study found that size of the bank assets, non-performing loan, liquidity position, cost to income ratio and assets quality have significant positive impact on overall banks profitability. Similarly, Gurung and Gurung (2022) assessed the

factors influencing the profitability of banks in Nepal. The result showed that GDP growth rate has a positive influence on banks profitability whereas non-performing assets has a negative influence on bank profitability. Likewise, Budhathoki and Rai (2020) analyzed the effect of specific factors on bank profitability: An evidence from Nepalese banks. The study concluded that bank profitability is negatively impacted by operating efficiency ratio. Further, Panta (2018) examined the non-performing loans and bank profitability: Study of joint venture banks in Nepal. The study found that there is a negative relationship of non-performing loan with banks' profitability.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of financial development on profitability of commercial banks. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the impact of financial development on profitability of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, non-performing loan, operational efficiency ratio (cost to income ratio), inflation, bank concentration and gross domestic product with the profitability of Nepalese commercial banks.

The remainder of this study is organized as follows: Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 12 Nepalese commercial banks from 2014/15 to 2022/23, leading to a total of 108 observations. The study employed convenience sampling method. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB), annual reports of the selected commercial banks, World Bank and OECD Inflation CPI indicator. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	Observation
1	Rastriya Banijya Bank Limited	2014/15-2022/23	9
2	Nepal Bank Limited	2014/15-2022/23	9
3	Machhapuchchhre Bank Limited	2014/15-2022/23	9
4	Nepal SBI Bank Limited	2014/15-2022/23	9
5	Siddhartha Bank Limited	2014/15-2022/23	9
6	Sanima Bank Limited	2014/15-2022/23	9
7	Prime Commercial Bank Limited	2014/15-2022/23	9
8	Citizens Bank International Limited	2014/15-2022/23	9
9	Everest Bank Limited	2014/15-2022/23	9
10	Himalayan Bank Limited	2014/15-2022/23	9
11	Standard Chartered Bank Nepal Limited	2014/15-2022/23	9
12	NMB Bank Limited	2014/15-2022/23	9
Total number of observations			108

Thus, the study is based on the 108 observations.

The model

The model used in this study assumes that profitability depends upon financial development. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are capital adequacy ratio, non-performing loans, cost-to-income ratio, inflation, bank concentration and gross domestic product. Therefore, the models take the following forms:

$$ROA_{it} = \beta_0 + \beta_1 CAR + \beta_2 NPL + \beta_3 OE + \beta_4 INF + \beta_5 BC + \beta_6 GDP + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 CAR + \beta_2 NPL + \beta_3 OE + \beta_4 INF + \beta_5 BC + \beta_6 GDP + e_{it}$$

Where,

ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity as measured by the ratio of net income to total equity, in percentage.

CAR = Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage.

NPL = Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage.

OE = Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage.

INF = Inflation rate as measured by the change in consumer price index, in percentage.

BC = Bank concentration as measured by the Herfindahl-Hirschman Index (HHI) using total assets of individual bank, total assets of all bank and number of commercial banks in the system, in ratio.

GDP = Gross domestic product as measured by the total goods and services produced within the country in a year, in percentage.

The following section describes the independent variables used in this study along with the hypothesis formulation:

Capital adequacy ratio

Capital adequacy ratio is a crucial financial indicator utilized in the banking and finance sectors to evaluate a bank's financial robustness and stability. It is calculated by taking a bank's capital and dividing it by its risk-weighted assets, then representing it as a percentage. Al-Homaidi *et al.* (2020) demonstrated that capital adequacy ratio significantly positive impact on return on assets. Similarly, Nguyen (2020) showed that bank capital adequacy ratio has a positive impact on banks' profitability, as measured by return on assets and return on equity. Likewise, Fristya and Rohmah (2024) showed a positive impact of capital adequacy ratio on the banks' profitability. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between capital adequacy ratio and profitability of banks.

Non-performing loan ratio

Non-performing loan ratio is a financial indicator that measures the percentage of a bank's loans that are classed as non-performing compared to its total loans. Kadioglu and Ocal (2017) investigated the effect of the asset quality on the bank profitability. The study showed that there is a significant but

negative relationship between non-performing loan and bank profitability. Likewise, Anggriani and Muniarty (2020) stated that banks need to reduce the rate of non-performing loans to enhance return on assets, indicating an inverse relationship between non-performing loans and profitability. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between non-performing loan and profitability of banks.

Operating efficiency (Cost to income ratio)

Cost-to-income ratio is a critical efficiency measure used in the banking and finance industries to determine how well a company manages its operating expenses in relation to its income. Mehzabin *et al.* (2023) found that operational efficiency or cost to income ratio have a negative impact on banks' profitability. Similarly, Anggraeni *et al.* (2022) indicated that operational efficiency ratio has a negative impact on profitability of banks. Likewise, Mathuva (2009) showed a negative impact of cost to income ratio on both return on equity and return on assets. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between operating efficiency and profitability of banks.

Inflation rate

Inflation rate is used to determine the change in the overall price levels of consumer goods and services in an economy within a specific time frame and is usually stated in percentages. Ghafel and Bougatef (2024) analyzed the impact of inflation on the financial performance of 14 Iraqi banks between the years of 2012 to 2022. The study revealed that there is a negative correlation between inflation and bank profitability. Similarly, Firmansyah *et al.* (2024) investigated the impact of policies inflation trends and individual bank characteristics on the profitability of banks in the Middle East and Africa. The study stated that inflation has a negative impact on both return on equity and return on assets. Likewise, Jayasena and Karunaratne (2023) examined the impact of bank-specific and macroeconomic factors on the profitability of Commercial Banks in Sri Lanka. The study found that inflation has a negative impact on bank profitability. Further, Rasheed *et al.* (2022) concluded that inflation has a negative relationship with bank profitability. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between inflation and profitability of banks.

Bank concentration

Bank concentration signifies the degree to which a few banks dominate the banking sector within a particular market or nation. It is often quantified by indices such as HHI or the share of assets, deposits or loans that are held by the top banks in the system. Ozili and Ndah (2024) examined the impact of financial development on bank profitability. The study found that there is a considerable negative association between the financial system's deposits to GDP ratio and Nigerian banks' non-interest revenue. The study also found that bank concentration, non-performing loans, cost efficiency and inflation are the major factors that affected the profitability of Nigerian banks. Similarly, Gharaibeh *et al.* (2022) found that bank concentration has a strong favorable impact on bank stability. Further, Alagoz (2016) indicated a positive connection between bank concentration and profitability. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between bank concentration and profitability of banks.

Gross domestic product

Gross Domestic Product (GDP) represents the overall monetary worth of all goods and

services generated within a nation's borders during a designated timeframe, usually assessed on an annual or quarterly basis. Seemule *et al.* (2017) discovered a notable and adverse correlation between GDP and bank profitability. Likewise, Hidayat *et al.* (2020) found a positive correlation between GDP growth rate and bank profitability. Moreover, Sultan *et al.* (2020) concluded that GDP has a positive impact on return on equity. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between gross domestic products and profitability of banks.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2014/15 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), BC (Bank concentration as measured by the Herfindahl-Hirschman Index(HHI) using total assets of individual bank, total assets of all bank and number of commercial banks in the system, in ratio) and GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
CAR	7.49	22.99	13.61	2.20
NPL	0.01	5.35	1.44	1.32
EFF	20.35	78.25	41.63	9.27
INF	3.60	9.70	6	1.88
CN	0.03	6.30	2.03	1.27
GDP	-2.37	8.98	4.19	3.44
ROA	0.47	3.22	1.56	0.48
ROE	3.78	69.56	15.81	7.10

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients matrix of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), BC (Bank concentration

as measured by the Herfindahl-Hirschman Index(HHI) using total assets of individual bank, total assets of all bank and number of commercial banks in the system, in ratio) and GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, in percentage).

Variables	ROA	ROE	CAR	NPL	OE	INF	BC	GDP
ROA	1							
ROE	0.328**	1						
CAR	0.198*	0.311**	1					
NPL	-0.115	-0.138	-0.354**	1				
OE	0.505**	0.029	-0.282**	0.437**	1			
INF	-0.051	-0.169	-0.346**	0.17	0.036	1		
BC	0.218*	0.347**	-0.214*	0.282**	0.101	-0.028	1	
GDP	0.256**	0.042	0.132	-0.124	-0.178	-0.647**	0.369**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 3 shows that capital adequacy ratio has a positive relationship with return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. In contrast, non-performing loan has a negative relationship with return on assets. It indicates that higher the non-performing loans, lower would be the return on assets. However, operating efficiency ratio has a positive relationship with return on assets. It indicates that increase in operating efficiency ratio leads to increase in return on assets. In contrast, inflation rate has a negative relationship with return on assets. It indicates that increase in inflation rate leads to decrease in return on assets. However, bank concentration ratio has a positive relationship with return on assets. It indicates that increase in bank concentration ratio leads to increase in return on assets. Likewise, gross domestic product has a positive relationship with return on assets. It indicates that increases in gross domestic product leads to increase in return on assets.

Similarly, the result also shows that capital adequacy ratio has a positive relationship with return on equity. It indicates that increase in capital adequacy ratio leads to increase in return on equity. In contrast, non-performing loan has a negative relationship with return on equity. It indicates that higher the non-performing loans, lower would be the return on equity. However, operating efficiency ratio has a positive relationship with return on equity. It indicates that increase in operating efficiency ratio leads to increase in return on equity. In contrast, inflation rate has a negative relationship with return on equity. It indicates that increase in inflation rate leads to decrease in return on equity. However, bank concentration ratio has a positive relationship with return on equity. It indicates that increase in bank concentration ratio leads to increase in return on equity. Likewise, gross domestic product has a positive relationship with return on equity. It indicates that increases in gross domestic product leads to increase in return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it presents the regression results of capital adequacy ratio, non-performing loan ratio, operating efficiency ratio, inflation rate, bank concentration and gross domestic product with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, non-performing loan ratio, operating efficiency ratio, inflation rate, bank concentration and gross domestic product on return on assets

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15 to 2022/23 by

using the linear regression model and the model is $ROA_{it} = \beta_0 + \beta_1 CAR + \beta_2 NPL + \beta_3 OE + \beta_4 INF + \beta_5 BC + \beta_6 GDP + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), BC (Bank concentration as measured by the Herfindahl-Hirschman Index(HHI) using total assets of individual bank, total assets of all bank and number of commercial banks in the system, in ratio) and GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		CAR	NPL	OE	INF	BC	GDP			
1	0.959 (3.282)**	0.044 (2.080)*						0.030	0.482	4.325
2	1.621 (23.247)**		-0.043 (1.196)					0.004	0.489	1.431
3	2.671 (14.137)**			0.027 (6.025)				0.248	0.425	36.298
4	1.639 (10.312)**				-0.013 (0.524)			0.007	0.492	0.274
5	1.389 (15.892)**					0.084 (2.300)*		0.039	0.480	5.291
6	1.407 (19.441)**						0.036 (2.273)*	0.057	0.476	7.428
7	1.042 (3.101)**	0.04 (1.759)	-0.019 (0.056)					0.023	0.484	2.275
8	2.372 (6.382)**	0.022 (1.113)	0.059 (1.649)	0.029 (5.825)**				0.256	0.422	13.304
9	2.445 (5.451)**	0.02 (0.955)	0.060 (1.661)	0.029 (5.802)**	-0.007 (0.295)			0.250	0.424	9.913
10	2.016 (4.496)**	0.032 (1.534)	0.032 (0.909)	0.028 (5.867)**	-0.003 (0.126)	0.107 (3.273)**		0.315	0.406	10.821
11	1.730 (3.355)**	0.035 (1.662)	0.036 (1.006)	0.027 (5.406)**	-0.026 (0.858)	0.087 (2.347)*	0.020 (1.122)	0.316	0.405	9.250

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on assets is the dependent variable.

Table 4 shows that the beta coefficients for capital adequacy ratio are positive with return on asset. It indicates that capital adequacy ratio has a positive impact on return on assets. This finding is similar to the findings of Al-Homaidi *et al.* (2020). In contrast, the beta coefficients for non-performing loan are negative with return on asset. It indicates that non-performing loan has a negative impact on return on asset. This finding is consistent with the findings of Kadioglu and Ocal (2017). However, the beta coefficients for operational efficiency ratio are positive with return on asset. It indicates that operational efficiency ratio has a positive impact on return on assets. This finding is not similar to the finding of Mehzabin *et al.* (2023). In contrast, the beta coefficients for inflation rate are negative with return on asset. It indicates that inflation rate has a negative impact on return on assets. This finding is consistent with the findings of Ghafel and Bougatef (2024). However, the beta coefficients for bank concentration ratio are positive with return on asset. It indicates that bank concentration ratio has a positive impact on return on assets. This finding is similar to the finding of Ozili and Ndah (2024). Likewise, the beta coefficients for gross domestic product are positive with return on assets. It indicates that gross domestic product has a positive impact on return on assets. This finding is consistent with the findings of Seemule *et al.* (2017).

Table 5 shows the regression results of capital adequacy ratio, non-performing loan ratio, operating efficiency ratio, inflation rate, bank concentration and gross domestic product with return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratio, non-performing loan ratio, operating efficiency ratio, inflation rate, bank concentration and gross domestic product on return on equity

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2014/15 to 2022/23 by using the linear regression model and the model is $ROE_{it} = \beta_0 + \beta_1 CAR + \beta_2 NPL + \beta_3 OE + \beta_4 INF + \beta_5 BC + \beta_6 GDP + e_{it}$ where, the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), BC (Bank concentration as measured by the Herfindahl-Hirschman Index(HHI) using total assets of individual bank, total assets of all bank and number of commercial banks in the system, in ratio) and GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		CAR	NPL	OE	INF	BC	GDP			
1	29.474 (7.174)**	1.004 (3.370)**						0.088	6.781	11.357
2	14.735 (14.621)**		-0.744 (1.438)					0.01	7.066	2.069
3	14.867 (4.687)**			0.023 (0.303)				0.009	7.132	0.092
4	11.967 (5.263)**				-0.639 (1.768)			0.019	7.032	3.126
5	11.872 (9.750)**					1.931 (3.807)**		0.112	6.692	14.492
6	15.442 (14.244)**						0.087 (0.433)	0.008	7.129	0.187
7	28.725 (6.075)**	0.967 (3.023)**	-0.173 (0.324)					0.08	6.81	5.683
8	31.806 (5.301)**	0.941 (2.741)**	-0.354 (0.614)	0.067 (0.836)				0.078	6.82	4.011
9	29.354 (4.058)**	0.941 (2.741)**	-0.323 (0.558)	0.062 (0.772)	-0.230 (0.611)			0.072	6.84	3.083
10	22.364 (3.096)**	0.756 (2.273)**	-0.125 (0.220)	0.047 (0.613)	-0.389 (1.071)	1.739 (3.311)**		0.154	6.532	4.897
11	22.364 (3.096)**	0.748 (2.223)*	-0.116 (0.202)	0.044 (0.546)	-0.451 (0.902)	1.688 (2.811)**	0.052 (0.180)	0.146	6.563	4.048

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Return on equity is the dependent variable.

Table 5 shows that the beta coefficients for capital adequacy ratio are positive with return on equity. It indicates that capital adequacy ratio has a positive impact on return on equity. This finding is similar to the findings of Nguyen (2020). In contrast, the beta coefficients for non-performing loan are negative with return on equity. It indicates that non-performing loan has a negative impact on return on equity. This finding is consistent with the findings of Anggriani and Muniarty (2020). However, the beta coefficients for operational efficiency ratio are positive with return on equity. It indicates that operational efficiency ratio has a positive impact on return on equity. This finding is not similar to the finding of Mathuva (2009). In contrast, the beta coefficients for inflation rate are negative with return on equity. It indicates that inflation rate has a negative impact on return on equity. This finding is consistent with the findings of Firmansyah *et al.* (2024). However, the beta coefficients for bank concentration ratio are positive with return on equity. It indicates that bank concentration ratio has a positive impact on return on equity. This finding is similar to the finding of Gharaibeh *et al.* (2022). Likewise, the beta coefficients for gross domestic product are positive with return on equity. It indicates that gross domestic product has a positive impact on return on equity. This finding is consistent with the findings of Hidayat *et al.* (2020).

4. Summary and conclusion

The banking industry is the most crucial part of the financial system. It plays a critical role in economic growth at firm, industry and macroeconomic levels. Banks are financial institutions that play intermediary role in the economy through channeling financial resources from surplus economic units to deficit economic units. In turn, they facilitate the saving and capital formation in the economy. Banking system plays an important role in the development of a country's economy and its financial stability. Banks have a very important function to play in the economic operations of any country as financial intermediary. Banks render services such as resource mobilization and allocation, financial intermediation and facilitation of foreign exchange transactions to enhance international trade. The task of providing funds to the economy makes their performance an important objective of any country.

This study attempts to examine the impact of financial development on profitability of Nepalese commercial banks. The study is based on secondary data of 12 commercial banks with 108 observations for the period from 2014/15 to 2022/23.

The major conclusion of this study is that capital adequacy ratio, operational efficiency ratio (cost to income ratio), bank concentration and gross domestic product have positive impact on return on assets and return on equity. It indicates that higher the capital adequacy ratio, operational efficiency ratio (cost to income ratio), bank concentration and gross domestic product, higher would be the return on assets and return on equity. In contrast, non-performing loan and inflation rate have negative impact on return on equity. It indicates that increase in non-performing loan and inflation leads to decrease in return on assets and return on equity. Likewise, the study also concluded that operating efficiency followed by bank concentration is the most influencing factor that explains the changes in the return on assets in the context of Nepalese commercial banks. Similarly, the study also concluded that bank concentration followed by capital adequacy ratio is the most influencing factor that explains the changes in the return on equity in the context of Nepalese commercial banks.

References

- Abdelmoneim, Z., and M. Yasser, 2023. The impact of bank performance and economic growth on bank profitability: CAMEL model application in middle-income countries. *Banks and Bank Systems* 18(3), 205-218.
- Adiatmayani, P. I. A., and S. I. B. Panji, 2021. The effect of credit risk and operational risk on profitability with capital adequacy variables as a mediating variable: A study on Indonesian state-owned banks for the period of 2015-2019. *Russian Journal of Agricultural and Socio-Economic Sciences* 115(7), 14-27.
- Al Arif, M. N. R., and T. B. Awwaliyah, 2019. Market share, concentration ratio and profitability: evidence from Indonesian Islamic banking industry. *Journal of Central Banking Theory and Practice* 8(2), 189-201.
- Alagöz, M., U. S. Akalın, and O. Ceylan, 2016. The relationship between concentration and profitability in Turkish banking sector. *JOEEP: Journal of Emerging Economies and Policy* 1(1), 11-18.
- Al-Homaidi, E. A., F. A. Almaqtari, A. T., Yahya, and A. S. Khaled, 2020. Internal and external determinants of listed commercial banks' profitability in India: dynamic GMM approach. *International Journal of Monetary Economics and Finance* 13(1), 34-67.
- Ali, D., and A. Anbar, 2011. Bank specific and macroeconomic determinants of commercial banks profitability: Empirical evidence from Turkey. *Business and Economics Research Journal* 2(2), 139-152.
- Al-Sharkas, A. A., and T. A. Al-Sharkas, 2022. The impact on bank profitability: Testing for capital adequacy ratio, cost-income ratio and non-performing loans in emerging markets. *Journal of Governance and Regulation* 11(1), 231-243.

- Alshebmi, A. S., M. H. M. Adam, A. M. Mustafa, and M. T. D. O. E. Abdelmaksoud, 2020. Assessing the non-performing loans and their effect on banks profitability: Empirical evidence from the Saudi Arabia banking sector. *International Journal of Innovation, Creativity and Change* 11(8), 69-93.
- Anggari, N. L. S., and I. M. Dana, 2020. The effect of capital adequacy ratio, third party funds, loan to deposit ratio, bank size on performance in banking companies on IDX. *American Journal of Humanities and Social Sciences Research* 4(12), 334-338.
- Anggraeni, A., B. Basuki, and R. Setiawan, 2022. Factors influencing on bank capital and profitability: Evidence of Government Banks in Indonesia. *The Journal of Asian Finance, Economics and Business* 9(2), 185-191.
- Anggriani, R., and P. M. Muniarty, 2020. The effect of non-performing loans (NPL) and capital adequacy ratio (CAR) on profitability (ROA) at PT. Bank Central Asia (BCA), TBK. *Ilomata International Journal of Management* 1(3), 121-126.
- Bashiru, S., A. Bunyaminu, I. N. Yakubu, M. A. S. Al-Faryan, J. Mac Carthy, and K. A. Nyamekye, 2023. Quantifying the link between financial development and bank profitability. *Theoretical Economics Letters* 13(2), 284-296.
- Buchory, H. A., 2015. Banking profitability: How does the credit risk and operational efficiency effect. *Journal of Business and Management Sciences* 3(4), 118-123.
- Budhathoki, P. B., and C. K. Rai, 2020. The effect of specific factors on bank profitability: evidence from Nepalese banks. *Journal of Economics and Business* 3(1), 82-89.
- Djaya, N. K., and I. Yanuarti, 2021. The influence of capital adequacy ratio and non-performing loan on performance of commercial banks listed on the Indonesia Stock Exchange in 2017-2019. *Business Excellence and Management* 11(4), 80-94.
- Firmansyah, B., A. Fajar Fardiansyah, and B. Dhevyanto, 2024. Global Uncertainty: The Influence of Monetary Policies Order and Inflation Volatility on Bank Profitability African Bank and Middle East Bank. *Journal Research of Social Science, Economics, and Management* 3(9), 1715-1724.
- Fristya, A., S. Arifin, and L. Rohmah, 2024. The influence of NPL and CAR on profitability. *International Journal of Economics, Science, and Education* 1(2), 64-74.
- Gersl, A. and J. Hermanek, 2008. Indicators of financial system stability: towards an aggregate financial stability indicator. *Prague Economic Papers* 2(1), 127-142.
- Ghafel, O. A., and K. Bougatef, 2024. The Impact of Inflation on Bank Profitability: Empirical Evidence from Iraq. *Pakistan Journal of Life and Social Sciences* 22(2), 1599-1607.
- Gharaibeh, O. K., B. Kharabsheh, and K. A. Al Daoud, 2022. Risks, bank concentration and their impact on stability in Jordanian commercial banks. *Academic Journal of Interdisciplinary Studies* 11(5), 223-234.
- Guiso, L., P. Sapienza, and L. Zingales, 2004. Does local financial development matter? *The Quarterly Journal of Economics* 119(3), 929-969.
- Gurung, J. B., and N. Gurung, 2022. Factors determining profitability of commercial banks: evidence from Nepali banking sector. *Prithvi Academic Journal* 5, 100-113.
- Hidayat, I., A. Alwahidin, and T. Aspiani, 2020. The effect of inflation, interest rate, and gross domestic products on the profitability of sharia banking in Indonesia. *Journal of Industrial Engineering and Management Research* 1(4), 59-66.
- Islam, M. R., 2023. The impact of macroeconomic factors on profitability of commercial bank in the UK. *International Journal for Multidisciplinary Research* 5(1), 1-19.

- Jayasena, D. M., and T. Karunarathne, 2023. Impact of bank-specific and macroeconomic factors on the profitability of Commercial Banks in Sri Lanka. *Sri Lankan Journal of Banking and Finance* 6(2), 39-53.
- Jigeer, S., and E. Koroleva, 2023. The determinants of profitability in the city commercial banks: Case of China. *Risks* 11(3), 1-21.
- Jing, E., 2020. Impact of high non-performing loan ratios on bank lending trends and profitability. *International Journal of Financial Studies* 8(12), 1-10.
- Kadioglu, E., and N. Ocal, 2017. Effect of the asset quality on the bank profitability. *International Journal of Economics and Finance* 9(7), 60-68.
- Karim, R., M. M. Roshid, F. B. Shamme, and M. M. Hasan, 2022. Non-performing loans and bank profitability: Evidence from Bangladesh. *International Journal of Finance and Banking Studies* 11(4), 95-102.
- Khalifaturafi'ah, S. O., 2018. Cost efficiency, total assets, and profitability: evidence from Islamic bank. *Jurnal Keuangan Dan Perbankan* 22(4), 769-778.
- Kingu, P. S., S. Macha, and R. Gwahula, 2018. Impacts of non-performing loans on bank's performance: Empirical evidence from commercial banks in Tanzania. *International Journal of Scientific Research and Management* 6(1), 71-79.
- Kolapo, M., P. Zajc, and J. Zoric, 2012. Bank efficiency differences in the new EU member states. *Baltic Journal of Economic* 9(2), 67-90.
- Lim, M. J., K. Tan, B. D. Hazlina, and S. Amirreza, 2023. A Threshold regression study on the impact of capital adequacy ratio on the profitability of ASEAN-5 banks. *International Journal of Advanced Business Studies* 2(3), 56-67.
- Martiningtiyas, C. R., and D. T. Nitinegeri, 2020. The effect of non-performing loans on performance in banking sector in Indonesia. *International Journal on Management, Accounting, and Economy* 151(8), 64-67.
- Mathuva, D. M., 2009. Capital adequacy, cost income ratio and the performance of commercial banks: The Kenyan Scenario. *The International journal of applied economics and Finance* 3(2), 35-47.
- Mehzabin, S., A. Shahriar, M. N. Hoque, P. Wanke, and M. A. K. Azad, 2023. The effect of capital structure, operating efficiency and non-interest income on bank profitability: new evidence from Asia. *Asian Journal of Economics and Banking* 7(1), 25-44.
- Mishra, A. K., and D. R. Kandel, 2023. Examination of specific factors of the form affecting profitability of commercial banks: A case from Nepal. *Journal of an International Interdisciplinary Research* 9(4), 13-24.
- Mittal, A., and A. K. Garg, 2021. Bank stocks inform higher growth-A System GMM analysis of ten emerging markets in Asia. *The Quarterly Review of Economics and Finance* 79(8), 210-220.
- Murtiningsih, S., and A. Tohirin, 2023. The influence of some bank financial ratios characteristics on profitability in sharia bank. *International Journal of Economics, Business and Accounting Research* 7(1), 350-365.
- Ngurah, R. G., and S. I. Panji, 2021. The effect of credit risk on profitability with capital adequacy as a mediation variables. *Russian Journal of Agricultural and Socio-Economic Sciences* 111(3), 72-82.
- Nguyen, T. H., 2020. Impact of bank capital adequacy on bank profitability under Basel II accord: evidence from Vietnam. *Journal of Economic Development* 45(1), 31-46.
- Nourzad, F., 2002. Financial development and productive efficiency: A panel study of developed and developing countries. *Journal of Economics and Finance* 26(2), 138-148.
- Ozili, P. K., 2019. Non-performing loans and financial development: new evidence. *The Journal of Risk Finance* 20(1), 59-81.

- Ozili, P. K., and H. Ndah, 2024. Impact of financial development on bank profitability. *Journal of Economic and Administrative Sciences* 40(2), 238-262.
- Panta, B., 2018. Non-performing loans and bank profitability: Study of joint venture banks in Nepal. *International Journal of Sciences: Basic and Applied Research* 42(3), 151-16.
- Priharta, A., and N. A. Gani, 2024. Determinants of bank profitability: Empirical evidence from Republic of Indonesia state-owned banks. *Accounting and Administration* 69(3), 49-65.
- Rasheed, R., M. N. Ishaq, and H. U. Rehman, 2022. Impact of inflation rate and exchange rate on the profitability of financial institutions. *Pakistan Journal of Social Research* 4(3), 132-139.
- Ryu, K. P., S. Z. Piao, and D. Nami, 2012. A Comparative study between the Islamic and conventional banking systems and its implications. *Scholarly Journal of Business Administration* 2(5), 48-54.
- Saleh, D. S., and E. Winarso, 2021. Analysis of non-performing loans (NPL) and loan to deposit ratio (LDR) towards profitability. *International Journal of Multicultural and Multireligious Understanding* 8(1), 423-436.
- Seemule, M., N. Sinha, and N. Tiroyamodimo, 2017. Determinants of commercial banks' profitability in Botswana: an empirical analysis. *IUP Journal of Bank Management* 16(2), 7-28.
- Silaban, P., 2017. The effect of capital adequacy ratio, net interest margin and non-performing loans on financial performance: The case of Indonesia. *International Journal of Economics and Business Administration* 5(3), 58-69.
- Sultan, K., R. R. Ahmed, F. M. Ameen, and M. Singh, 2020. The effect of macroeconomic and bank specific factors on banks profitability: Empirical evidence from banking industry of Pakistan. *Humanities and Social Sciences Reviews* 8(3), 635-645.
- Swandewi, N. K. M., and N. K. Purnawati, 2021. Capital adequacy ratio mediates the effect of non-performing loan on returns on assets in public commercial banks. *American Journal of Humanities and Social Sciences Research* 5(1), 651-656.
- Tan, Y., and C. Floros, 2012. Bank profitability and inflation: the case of China. *Journal of Economic Studies* 39(6), 675-696.